

e-HRM Systems for the Civil Service in Kazakhstan, Kyrgyzstan, Uzbekistan and the Republic of Korea

This publication is the result of a cross-country comparative study exploring the development of electronic personnel management systems. Conducted jointly by the Astana Civil Service Hub and the Ministry of Personnel Management of the Republic of Korea, the study focused on three Central Asia countries (Kazakhstan, Kyrgyzstan, and Uzbekistan) and the Republic of Korea, with the latter serving as a benchmark case for an electronic human resource management system (e-HRMS). The findings underscore the areas for improvement in the currently operational e-HRMS, along various dimensions of the human resource management functions and personnel administration in the government sector of the participating countries.

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Prologue

Human resource management and personnel policy support systems play an integral role for effective and efficient human resource management in public administration organisations, i.e., recruitment, motivation, and career development of competent personnel to staff these organisations. Consequently, the integration of digital technologies into the public sector has given rise to the development and maintenance of electronic human resource management systems (e-HRMS), which streamline operations and processes and aid decision making in the human resource management realm.

This advance has allowed for personnel management and policy support systems to administer and manage data related to public personnel, i.e., payroll, benefits, allowances, performance evaluation, education and training, and work functions in an integrated manner. This has led to higher efficiency and speed in administering personnel related processes, and to a more customised management of personnel needs, i.e., talent management, career development, etc.

The utilisation of e-HRM has also led to a reduction of costs by lightening the administrative burden in managing personnel records, and at the same time it has helped redefine the role of HR professionals, who can now devote more time to strategic human resource management matters that are paramount in maintaining and developing a personnel force compatible with rapid change, a characteristic of our time.

This comparative analysis of e-HRM systems of the four countries participating in the study, provides an excellent opportunity to delve deeper into the ways e-HRM systems are designed, developed, deployed, and managed and to assess their benefits and impact. It is also a perfect occasion to observe to what extent they have integrated personnel management processes and whether they have accomplished their goals from a user perspective. In fact, the findings of the study have helped in gaining a deeper understanding of the current state of the e-HRM systems' utility and functionality in these four countries, as well as what needs to be done so that they completely fulfil their intended vision.

We sincerely hope that this work contributes to the on-going assessment of e-HRMS as they have been rolled out in three countries of the Central Asian region and in the Republic of Korea and to providing some lessons on how best to approach e-HRMS development, deployment, maintenance, and enhancement, overall.

We also hope that you will find this report informative and useful in your work field, as its ultimate aim is to contribute to disseminating knowledge and experience that may assist to developing robust electronic personnel management and policy support systems in countries around the world.



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Last, but not least, heartfelt thanks are extended to all collaborators and participants for dedicating their time and interest to enhancing the understanding of e-HRMS development in their respective countries. Each individual has played a crucial role in turning this initiative into a reality.

About the Ministry of Personnel Management (MPM)

The Ministry of Personnel Management (MPM) is a central government agency of the Republic of Korea responsible for designing and implementing public personnel policy including recruitment, remuneration, human resource development, welfare and pension programmes, and ethics and disciplinary processes affecting the public officials of Korea. In November 2014, the MPM was newly established under its current name to reinforce a fair, transparent, and balanced innovation throughout the civil service system in Korea. Currently, the MPM consists of 8 bureaus and 31 divisions, and two affiliated organisations including the National Human Resources Development Institute (NHI) and the Appeals Commission totalling 594 employees (405 in head office and 189 in affiliated organisations, as of 26 March 2024).

More information at <https://openminister.mpm.go.kr/english/>.

About the Astana Civil Service Hub (ACSH)

The Astana Civil Service Hub is a flagship initiative of the Government of Kazakhstan and the United Nations Development Programme. It was created in 2013 by 5 international organisations and 25 countries: now comprising 43 participating countries. The geographical range of its participants stretches from the Americas and Europe through the CIS, the Caucasus, and Central Asia to ASEAN countries, demonstrating that partnerships for civil service excellence is a constant and universal need for all nations.

Its mandate is to assist in the promotion of public service effectiveness by supporting the efforts of governments of the participating countries in building institutional and human capacity; and thus, contributing to the improvement of civil service systems in the countries of the region and beyond.

The Astana Civil Service Hub is a multilateral institutional platform for the continuous exchange of knowledge and experience in the field of public service development, aiming at supporting government in the region and beyond through fostering partnerships, capacity building and peer-to-peer learning activities, and evidence-based research.

More information at www.astanacivilservicehub.org.

About the United Nations Development Programme (UNDP)

The United Nations Development Programme (UNDP) is the leading United Nations organisation fighting to end the injustice of poverty, inequality, and climate change. Working with its broad network of experts and partners in 170 countries, it helps nations to build integrated, lasting solutions for people and the planet.

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Abbreviations & Acronyms

ACMS	Access Control and Management System
ACSH	Astana Civil Service Hub
AI	Artificial Intelligence
API	Application Programming Interface
ARGOS	Agency for the Development of Public Service under the President of the Republic of Uzbekistan
BPR	Business Process Reengineering
CLS&SR	Committee on Legal Statistics and Special Reports
CPO	Chief Privacy Officer
e-HRM	Electronic Human Resource Management
e-HRMS	Electronic Human Resource Management System
EDMS	Electronic Document Management System
EDS	Electronic Digital Signature
FAQ	Frequently Asked Questions
GDP	Gross Domestic Product
GPKI	Government Public Key Infrastructure
HR	Human Resources
HRM	Human Resource Management
ICT	Information and Communication Technologies
ID	Identification Document
IDP	Identity Provider
IMU	Infrastructure Management Unit
ISP	Information Systems Planning
KPI	Key Performance Indicator
KZT	Kazakhstan Tenge
MDDIAI	Ministry of Digital Development, Innovations and Aerospace Industry
MFA	Ministry of Foreign Affairs
MIA	Ministry of Internal Affairs
MOIS	Ministry of the Interior and Safety of the Republic of Korea
MPM	Ministry of Personnel Management of the Republic of Korea
NCCSPM	National Centre for Civil Service Personnel Management
NEIS	National Education Information System
NHI	National Human Resource Development Institute
NIT	National Information Technologies
PIN	Personal Identification Number
RPU	Requests Processing Unit
SMS	Short Messaging System
UNDP	United Nations Development Programme
UNLS	Unified National Labour System in Uzbekistan
USD	United States Dollar
UX	User Experience
UzASBO	Compensation System for Civil Servants of the Republic of Uzbekistan
VPN	Virtual Private Network

INTRODUCTION

The application of digital technologies in the civil service human resource management policies and practices is still evolving, and while there is much discourse about the benefits of electronic personnel management systems, empirical evidence suggesting what conditions do e-HRM systems have to meet for contributing to strategic and technical HRM effectiveness is limited.

The four countries participating in this research project have already deployed electronic human resource management systems in government organisations, but the areas these systems cover vary in both breadth and depth. A comparison between the benchmark country, i.e., the Republic of Korea, and the three Central Asia countries has revealed that there is still much to be done to bring their systems on par. Hence, the objective of this cross-country comparative analysis was to find the gaps between current and optimal operational capacities and capabilities of the existing e-HRM systems in Kazakhstan, Kyrgyzstan, and Uzbekistan on the one hand, and the Republic of Korea on the other.

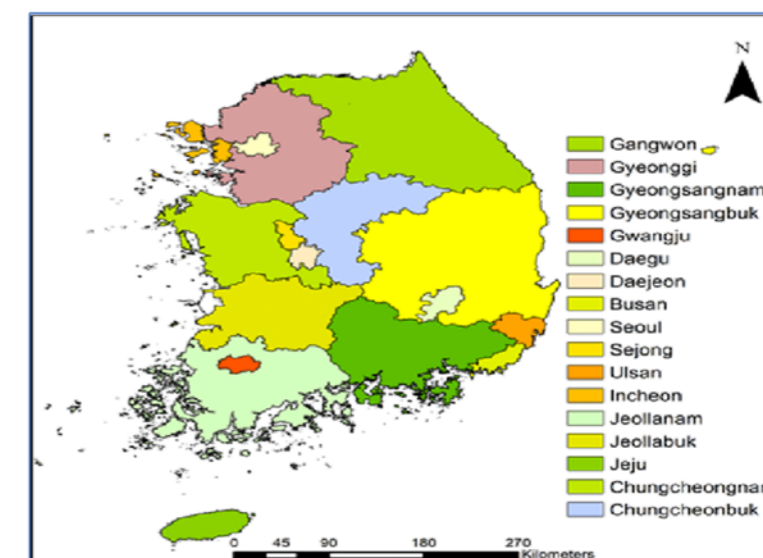
This report presents the findings of an in-depth case study focusing on such questions as how the four countries have deployed their e-HRM systems, what is the current state of their development, and the major factors which influence the stability and robustness of their e-HRMS. The report also presents the main users' perspectives on the functioning of their respective electronic personnel management systems, actual benefits derived, as well as drawbacks that hinder the optimal performance of their systems, as they were captured through a series of interviews.

COUNTRY BACKGROUND INFORMATION

Republic of Korea

According to the latest available statistics the current population of the Republic of Korea is over 51.5 million people. Administratively, the country is divided into six metropolitan cities, one special city, one special self-governing city, and nine provinces. These are further subdivided into various entities such as cities, counties, districts, towns, townships, neighbourhoods, and villages (Fig.1).

Figure 1: Administrative structure of the Republic of Korea¹



¹ Adhikari, P.; Lee, Y.H.; Park, Y.-S.; Hong, S.H. Assessment of the Spatial Invasion Risk of Intentionally Introduced Alien Plant Species (IIAPS) under Environmental Change in South Korea. *Biology* 2021, 10, 1169. <https://doi.org/10.3390/biology10111169>

The civil service personnel systems in the Republic of Korea are guided by three fundamental principles: the «Democratic Civil Service System,» emphasising a commitment to serving the Korean populace; the «Career Civil Service System,» recruiting individuals dedicated to a lifelong commitment to public service; and the «Merit System,» placing individuals in roles strictly based on qualifications and abilities, irrespective of political affiliation or favouritism.

Korea boasts approximately one million public servants, with 660,000 serving as national public officials and 380,000 as local officials (2017). The Korean civil service is broadly divided into «career» and «special career» civil servants. Career civil servants encompass general services, special services, and technical services personnel, while special career civil servants include politically determined personnel, specially designated services personnel, contract-based personnel, and manual workers.

In addition, the civil service system in Korea aligns with a strong tradition of seniority, reflected in its grade-based position assignment and remuneration.² Recruitment from outside is limited to certain grade levels, with promotions based primarily on seniority. Civil servants, under the Civil Service Law, are deemed servants of the people and are mandated to embody kindness, fairness, and sincerity.

The personnel management framework at all levels is supported by «e-Saram», a standardised electronic human resource management system. Enabling government-wide personnel administration, «e-Saram» has computerised tasks from recruitment to retirement, facilitating electronic management of appointments, performance evaluations, training, work schedules, and salaries. Since 2014, mobile services are supporting a flexible work environment.

Kazakhstan

Kazakhstan is administratively divided into 17 regions, each segmented further into districts, as well as the cities of Shymkent, Almaty, and the capital, Astana, which operate independently of their surrounding regions (Fig. 2). The population of Kazakhstan is over 19 million (2023).

Figure 2: Administrative structure of the Republic of Kazakhstan



² Career civil servants are classified based on nine levels with 1 being the highest (Assistant Minister level) and 9 being the lowest.

In Kazakhstan, the role of civil servants in public agencies is pivotal for realising state objectives. A Kazakhstani civil servant is a citizen holding a public position within a state agency, undertaking official duties to fulfil the tasks and functions of the state.

The Kazakhstani civil service encompasses two distinct categories: administrative and political civil servants. Administrative civil servants are further classified into two groups: corps A and corps B. Corps A comprises managerial positions with a specialised selection process, competitive requirements, and specific eligibility criteria, including education, work experience, and competencies. Corps B encompasses administrative positions that do not fall under corps A, with roles of lower official standing. There are a total of 88,321 civil servants, with 87,567 serving in administrative roles and 754 serving in political ones.³

The distinction between political and administrative civil servants lies in their responsibilities. Political civil servants are those whose appointment or election, termination, and performance are politically oriented, with associated responsibilities for executing political tasks and goals. While administrative civil servants have established categories (A, B, C, D, E) for their positions, political civil servants operate without predefined categories.

Kyrgyzstan

Kyrgyzstan is divided into seven administrative regions and 39 districts (Fig. 3). Cities such as Bishkek, and Osh operate independently and do not fall under the jurisdiction of surrounding regions. The current population of Kyrgyzstan is over 6 million.

Figure 3: Administrative structure of the Kyrgyz Republic⁴



The Kyrgyzstani civil service comprises a total of 18,700 civil servants that are employed in:

- Legislative activities – 600;
- Executive activities - 14,800 (among them employees in the local government - 10,000);
- Judicial activity – 3300.

In Kyrgyzstan, the civil service system is defined by key concepts outlined in the law. Public service encompasses professional activities undertaken by citizens of the Kyrgyz Republic within government bodies, including state civil service, military service, law enforcement service, and

³ This figure excludes individuals employed by the Ministry of Internal Affairs, numbering 123,581 employees.

⁴ Háva, Jiri. (2022). A contribution to knowledge of the Dermestidae (Coleoptera) fauna of Kyrgyzstan. 10. 1-3.

diplomatic service.⁵ State civil servants, or employees, are citizens of the Kyrgyz Republic holding administrative positions in state bodies. They engage in on-going professional activities for monetary remuneration from the republican budget, executing powers bestowed by the position and bearing responsibility for their execution. Municipal employees, akin to state civil servants, hold administrative positions in local government bodies and perform professional official activities for monetary remuneration from the local budget.

Administrative positions within the civil service are categorised into the highest, main, senior, and junior positions. These positions are organised into groups, and class ranks are assigned to employees based on the register of state and municipal positions, corresponding to groups and categories. Class ranks, such as junior inspector, inspector, adviser, and counsellor, are assigned to each employee holding an administrative position and reflect the individual's standing within the civil service system. The functioning of the civil service system is supported by career planning. This planning involves the personnel reserve, competitive selection, certification, rotation, training, and material and non-material motivation.

Uzbekistan

Uzbekistan's administrative divisions include one autonomous republic, twelve regions, and one independent city—Tashkent (Fig. 4). The regions are further subdivided into districts, cities of regional subordination, urban-type settlements, and citizen assemblies of villages, all part of the overall governance structure of the country. The current population of Uzbekistan is over 35 million (2021).

The total number of civil servants in Uzbekistan is 118,000. It is worth noting that this number does not include employees of the Ministry of Internal Affairs (MIA), whose total reaches 120,000 employees. In Uzbekistan, a state civil servant is defined as a citizen of the Republic who serves in a state civil service position. The state civil service system is characterised as a unified organisational and legal complex, incorporating mechanisms for selection, placement, remuneration, professional development, and promotion of state civil servants. State civil service positions are categorised into political, managerial, and support, with categories determined in the State Register of State Civil Service Positions. For managerial and support positions, state civil servants are appointed through competitive processes and dismissed by the head of the respective state body.

Figure 4: Administrative structure of the Republic of Uzbekistan⁶



⁵ State civil service, a subset of public service, involves citizens executing on-going tasks, functions, and powers outlined in the Constitution and regulatory legal acts. Similarly, municipal service entails professional service activity within local government bodies for the continual implementation of designated tasks, functions, and powers as per constitutional and legal directives;

<http://cbd.minjust.gov.kg/act/view/ru-ru/112303?cl=ru-ru>

⁶ <https://stat.uz/en/press-center/news-of-committee/28760-population1810-3>

RESEARCH METHODOLOGY

This research project employed a qualitative approach to capture a comprehensive snapshot of the current stage of the e-HRMS development in the four participating states and identify where improvements are needed across various dimensions aimed at further enhancing the efficiency of the government sector electronic personnel management systems. The findings of this study are based on data collected mainly through focus group interviews - administered in person - in central governmental bodies responsible for e-HRM policy and implementation in the four participating countries, that is the Ministry of Personnel Management of the Republic of Korea, the Agency for Civil Service Affairs of the Republic of Kazakhstan, the State Agency for Civil Service and Local Government under the Cabinet of Ministers of the Kyrgyz Republic, and the Agency for the Development of Public Service under the President of the Republic of Uzbekistan. The findings were also informed by the usability assessment results of the e-HRMS web interfaces and, where applicable, of the mobile application interfaces.

Heads and specialists of HR Units from different ministries and other central-level state bodies – the main users of the e-HRMS – were invited to the interviews. Interviews were also conducted with representatives of developers and maintenance companies.⁷ All fifteen focus-groups and one individual interview, each lasting for 1.5 hours on average, were conducted from May to June 2023.

This case study utilised purposeful sampling to select the focus groups participants to ensure a comprehensive exploration of the most relevant perspectives. Diverse stakeholders, including policymakers, system developers/maintainers, HR heads, and specialists, were deliberately selected; as they are individuals who possess significant experience of working with the e-HRM systems. The total number of interview participants was 55 from all four countries.

Table 1: Number of interviews' participants by country and gender

Number of participants	Republic of Korea	Kazakhstan	Kyrgyzstan	Uzbekistan
Male	4	7	3	8
Female	6	13	9	5
Total per country:	10	20	12	13
Total in four countries:	55			

Structured interview protocols were designed to include a series of questions aimed at capturing the opinions and views of interviewees on the current status of their e-HRMS development and operational capacity, on the challenges they have confronted, and on opportunities for further enhancement.

The questionnaires covered four relevant aspects: institutional framework, operational dimensions, user participation, and user involvement. The organisational framework aspect comprised the regulatory framework, organisational components, goals of the e-HRMS, and the type of the e-HRMS. Operational dimensions encompassed available functionality, existing infrastructure, extent of coverage, and integration. User participation and involvement were operationalised through questions addressing system usage among users, and extent to which training, support, and information are provided. Although interview questions differed among stakeholder groups, they all covered the e-HRMS key aspects, as outlined in Table 2.

⁷ Individuals from either affiliated government and quasi-government institutions, or private sector organisations, depending on whether development and maintenance were performed by government entities or were outsourced to private entities.

Table 2: Interview guide

	e-HRMS aspects	Sample questions
Foundational pillars	Regulatory, organisational	(1) does a national organisation exist that create, manage, and operate the electronic personnel management system? (2) how is the system maintained and enhanced? (3) is there a special maintenance and enhancement budget? (4) how are data security and personal privacy ensured within the e-HRM?
	Goals	(1) has the e-HRM system reduced the cost of HRM services and how? (2) have HR services improved with the introduction of electronic personnel management system and how? (3) does the e-HRM have a strategic orientation of HRM?
	Features	(1) to what extent are administrative HR functions, e.g., employee personal data and payroll, embedded in the system? (2) does the e-HRM system provide the choice between asking employees to keep their own personal data up to date through an HR portal or is there administrative apparatus in place to do this? (3) does the system support HR policy implementation by means of recruitment, training, performance management, etc? (4) has the e-HRM transform the HRM functions and (5) does it support strategic decision making on personnel matters?
Operational dimensions	Available functionality	(1) what standard HRM system services are supported electronically? (2) does the e-HRM handle personnel policy support services? And if yes, to what extent? (3) is there an information analytics service available? (4) is there a statistics support function offered on a real time basis? (5) what other tasks does the electronic personnel management perform?
	Coverage, infrastructure	(1) at what government level has the system been introduced to? (2) what is the coverage rate of e-HRM in terms of the number of government organisation utilising the system? (3) where does government store HRM critical data on the nationwide cloud, if any or in local servers?
	Integration	(1) is the e-HRM integrated with other e-Government systems? If yes, to what extent? (2) is there HR data connection among ministries, agencies, etc.? (3) is there an information utilisation system integrated for joint use of HR information?
Participation / involvement	Training, support	(1) to what extent, if any, e-HRM trainings are conducted for all government employees? (2) is e-HRM training compulsory for main users?
	Usage	(1) who are the users of the electronic personnel management system? (2) is there a mobile application of the e-HRM system? (3) the number of active users aggregated by categories.

FINDINGS

The findings of this study are a culmination of information collected through extensive interviews with public personnel policy makers, HR professionals, and many e-HRM system users in Korea, Kazakhstan, Kyrgyzstan, and Uzbekistan. They provide a deeper look into the ways the respective e-HRMS are designed, developed, rolled out, maintained, and managed; and how they are evolving by incorporating different personnel management processes and procedures and how they are integrating with other electronic government systems.

The findings also allowed for an assessment of benefits derived following the deployment of the e-HRMS and their impact on personnel management and human resource support systems in the four countries participating in this study. By looking at the trajectory of their design development stages, their similarities and differences in their design and architecture, their functionalities, coverage, usage of the system and user experience, training, and support, as well as of the levels of data protection and privacy; it was possible to discern certain limitations and challenges associated with the current state of the e-HRMS and observe some shortcomings with respect to

optimal operational capacity and functionality.

The findings are presented by country. They start with a brief description of the e-HRMS evolution and development over time in each of the four countries. Then, they continue with providing information on the governance and management of the overall system, i.e., the government authority that oversees its development, deployment, maintenance, and potential improvements; on the functionality of the system, i.e., the administrative and policy-related activities of personnel management it covers and the type of information that is made available through its statistical module for decision-making and policy planning and formulation.

The coverage of the system, i.e., the number of public employees it manages, is presented next followed by the degree of its integration of personnel processes and procedures and with other electronic government systems, and the degree of unification of hardware, software, and databases; utilised by the system; as well as the level of training and support provided to its users, and the users participation and involvement in the system development. The final part of the analysis describes the benefits the system has generated and the impact it has had on government personnel management. This part ends by touching upon the challenges and limitations the e-HRMS that need to be overcome for reaching an optimal state of operation.

Republic of Korea

Brief description

The Korean e-HRMS, the “e-Saram” is a digital system for managing public human resources, serving as the backbone of South Korea’s civil service administration. It comprises two core components: the “Standard HRMS” and the “HR Policy Support” system. The Standard HRMS is used by every government ministry and agency to manage data concerning human resources personal details, compensation, performance assessments, education and training qualifications, and other services such as annual, sick leave, etc, and which are pooled into a structured database, enabling efficient data handling. The HR Policy Support module manages policy-related services, such as recruitment, promotion, and evaluation of senior public officials and presidential appointees. A third module is also part of the system that provides various status updates and statistical tools to facilitate timely decision-making and efficient administration of public human resources.

The e-Saram’s origins can be traced back to the early 2000s, at a time no other fully fledged electronic personnel management and personnel policy support systems existed around the world. The first generation of e-Saram became operational in early 2001, and it underwent pilot testing at four ministries and agencies, gradually expanding to all ministries and government agencies by 2008.

In the absence of such human resource systems, the first-generation e-Saram was subjected to systematic BPR (business process reengineering). It was instrumental to streamline processes before, digitising them, in order to avoid merely automating existing – manually executed – tasks. This practice continued into the second generation, and it is continuing into the third, as this iterative approach has ensured adaptability to evolving work methods and policies.⁸

While developing the second generation of e-Saram, in 2011, an ISP (information systems planning) approach was adopted,⁹ with a particular emphasis placed on defining the system’s functionalities addressing the question “What to build” - in contrast with the first-generation

⁸ A necessary methodological approach for ensuring systematic development while considering and accommodating changing requirements and policies.

⁹ When the BPR stage was completed, development advanced to the ISP stage. In this manner, the design and construction of the system aligned with specific functionalities. In effect, the ISP incorporated functionalities, e.g., annual leave and flexible work hours, while BPR focused on execution and implementation of associated processes.

e-Saram, whose primary focus was on enhancing workflows and digitalising human resource processes, thus addressing the question on “how to do it”.¹⁰ The introduction of the second-generation e-Saram, in 2012, allowed for a smooth integration of a multitude of disparate systems operating across a multitude of government institutions, and thus creating a cohesive and unified e-Saram framework.¹¹

In 2013, in response to the proliferation of hand-held smart devices, the e-Saram mobile system was also introduced. This system enables the handling of various types of information through mobile devices, such as requests for annual leave, business trips, work schedule adjustments, and assignments. Users can also access their salary statements, appointments, transfers, and promotion events. For approval related activities, the system offers functions for managing and tracking approvals, including status updates. Users can also receive notifications via push notifications of approvals in progress or when completed. Other functions include access to announcements, retrieval of service centre information, and access to basic user information.

Figure 5: e-Saram Mobile Service



In 2020, enhancements were introduced to automate the traditional manually performed compensation procedures by integrating the relevant systems. In addition, a digital-based HR policy was established for transforming civil service management processes, such as secondment and recruitment. This expansion paved the way for a more transparent and intelligent HRM services.

¹⁰ Another distinction between the first and second generations of e-Saram lay in their architecture. The first was programme-based necessitating installations on computers. The second transitioned to the web, prioritising user convenience and refining each function; as well as incorporating the capability for the generation of statistics on demand.

¹¹ Seventy distinct institutions, part of the network, functioned independently using their own separate servers and each maintaining their own unique systems and adhering to specific regulations of their respective ministries. In total, 180 distinct systems have been seamlessly integrated with e-Saram.

The e-Saram is built on a foundation of Java,¹² and it utilises Oracle as the underlying database system.¹³ For public civil servants and individual users, the web pages are accessible through standard web browsers like Google Chrome or Microsoft Edge. However, the interface differs for administrators, who utilise a specialised commercial software known as X-platform.¹⁴ This software was procured by the developer organisation to enhance the functionality and user experience of the administrator pages.

Governance and Management

The e-Saram covers only all central administration personnel,¹⁵ in contrast with other countries, where a unified e-HRMS exists – and it is coordinated and managed by the Ministry of Personnel Management (MPM).¹⁶ An essential aspect of this arrangement is that the MPM has the capability to access the data of all organisations that are part of e-Saram, which facilitates efficient monitoring and coordination in HRM processes.

The e-HRMS development and maintenance are entrusted to private sector companies, selected through a transparent and equitable competitive process, e.g., open competitions. The key rationale for outsourcing development and maintenance work is that government officials generally lack the necessary specialised development skills and competencies. Currently, there is an 20-member team dedicated to enhancing and maintaining the e-HRMS.

The e-Saram data are backed up regularly to ensure its integrity and security. A comprehensive backup of the entire system is conducted weekly, and an incremental backup is performed daily, capturing daily changes.

Functionality

The e-Saram encompasses administrative and policy-related activities and a statistical module generating statistics on demand for administrative and policy-related purposes. The administrative HR activities encompass day-to-day transactions and record keeping, e.g., personal data, education, qualifications, certifications, leave requests, awards, penalties, compensation, entitlements, benefits, etc. The policy-related HR activities include HR planning, selection, performance assessment, compensation levels, benefits, training, career development, and appointment decisions.

¹² <https://www.java.com/ru/>

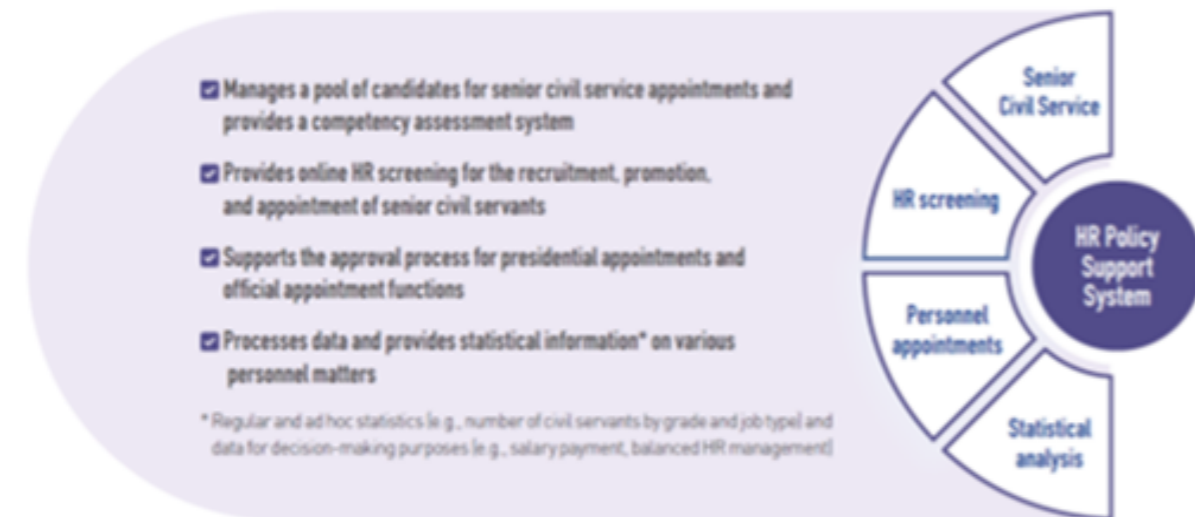
¹³ <https://www.oracle.com/cis/>

¹⁴ http://docs.tobesoft.com/getting_started_xplatform_en

¹⁵ The e-HRMS for local administration personnel – “Insarang” – is coordinated and managed by the Ministry of the Interior and Safety (MOIS) and the e-HRMS for education personnel – National Education Information System (NEIS) – by the Ministry of Education;

<https://www.keris.or.kr/eng/na/ntt/selectNttInfo.do?mi=1091&nttSn=38915>

¹⁶ The Ministry of Personnel Management (MPM) is a central government organisation of the Republic of Korea with the mandate to design and implement various public personnel policies. These policies cover recruitment, compensation levels and welfare and pension programmes, human resource development, and disciplinary actions impacting public officials in Korea. At present, the MPM comprises eight Bureaus and 29 divisions, along with two affiliated organisations – the National Human Resource Development Institute (NHI) and the Appeals Commission. The total number of the Ministry’s employees is 594, with 403 of those working for the Ministry itself and 191 for the affiliated organisations (as of 31 May 2022); <https://www.mpm.go.kr/english/>

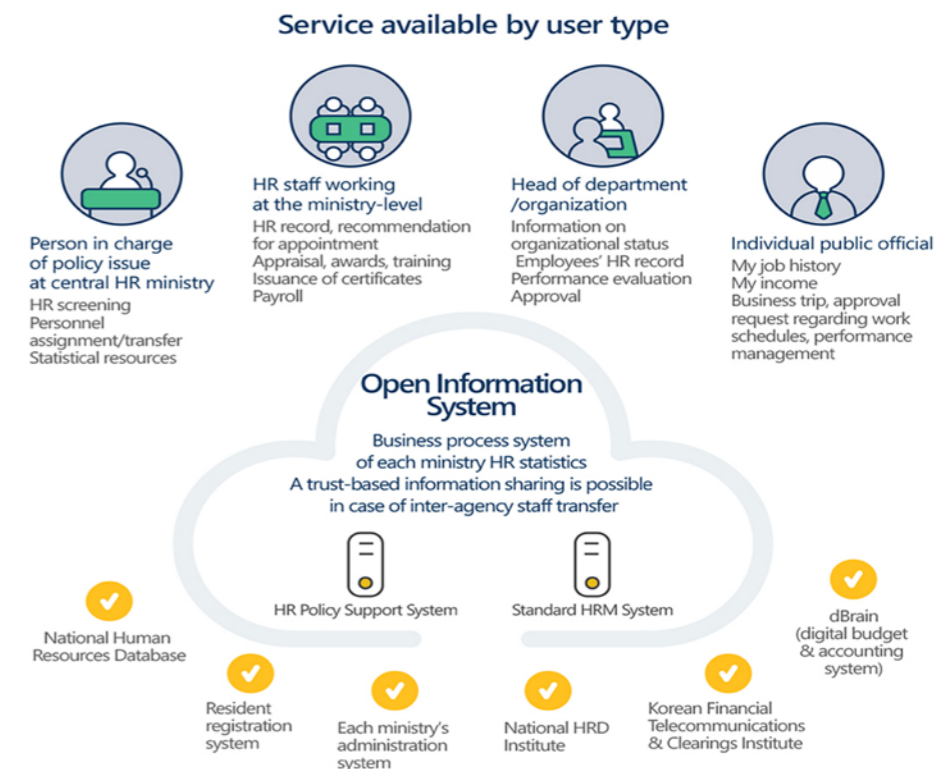
Figure 6: Major functions of e-Saram

For ensuring flexibility and scalability to changing needs and future growth, the e-Saram has three distinct domains: (i) profiles of government officials; (ii) work schedules, annual and other types of leave; and (iii) payroll-related matters. These three domains have the capacity to operate as stand-alone separate systems. However, they are also integrated into a unified and comprehensive system. For instance, when government officials request any type of leave, this has implications on both their payroll and their promotion prospects. In this context, the integrated system is designed to ensure that changes occurring in one area do not necessarily require changes in the other two.¹⁷

The system provides tailored services to various user categories, encompassing tasks such as browsing, recording, and management. This approach ensures that policy service administrators, service administrators in individual ministries and agencies, division heads, organisation leaders, and individual public servants all receive services optimised in accordance with their respective roles and responsibilities. In fact, e-Saram system access to data is segmented

¹⁷ To illustrate, if there are modifications to the rules governing annual leave, this does not automatically mean that the rules pertaining to government officials' profiles or payroll have to be altered. Only the functionality related to annual and other types of leave will be adjusted, keeping the other areas unaffected.

into three categories: (i) for individual users;¹⁸ (ii) for department administrators; and (iii) for HR managers, thus accommodating the diverse responsibilities the system's user base have.

Figure 7: Service available by user type

E-Saram's functionality goes beyond personal information management, as it can also perform appointment related functions. For instance, when vacant positions are announced in various departments, interested candidates can apply for up to four positions at the same time ranked in order of preference. This feature streamlines the appointment function.

The e-Saram provides statistics primarily on managing employee annual and various other types of leave, e.g., family care, medical, etc. A recently implemented system update automated the generation of essential data, such as the average number of leave days taken by employees, reducing workload for personnel administration considerably. The e-Saram also allows for the generation of periodic reports that need to be submitted (once or twice per year). Furthermore, the system offers filtering functions for selecting only the necessary information for the generation of a given report.

¹⁸ An example of an individual user functionality is "leave". If individual users would like to take leave, they can input the information, and the approval process is automatically carried out. If an individual user is unable to do so, administrators or HR managers can help. The format for leave requests - unlike in other countries - is not document-based; rather, it is integrated into the system itself.

Figure 8: Screen for applying vacation

성명	소속	직급	연속입직연월	재직상태
박	기획조정실 정보화담당관	사무관	2011.04.22	재직

연도	2018
제정기간	2018.09.01 ~ 2018.12.31
연가신청수	22명 (12개월)
잔여가용수	0
사용(신청)일수	6일
잔여일수	16일
상반기	15일 04:40

연기종류	연기기간	연기일수	잔여일수
연가	2018.06.15	1	1
연가	2018.04.13	1	1

Figure 9: Screen for employee's work status management

구분	취업시간	퇴직시간	가용시간	사용시간	잔여시간
가용	0:00	120:00	120:00	4:00	116:00
연가	-	-	1514:00	188:18	1425:42

구분	01/02 (월)	02/03 (화)	02/04 (수)
근무상태	연가		

Data extracted from the e-Saram serves a crucial role in decision-making. For instance, during the COVID19 pandemic, data played a pivotal role in having a clear picture of the number of employees who contracted the virus, how many required medical leave, and other related metrics. This information served as the basis for decision-making and assessment of the situation by the senior management of government organisations. Furthermore, leave data is utilised to calculate and maintain accurate records for employees' remaining leave balances.¹⁹

¹⁹ HR managers first compute manually leave entitlements and subsequently cross-verify the results with the system's calculations. This verification process is particularly relevant in cases like maternity leave, where discrepancies may arise due to inaccurately filled information in the system or the data is omitted. Thus, manual calculations are performed as a precautionary measure, and to ensure accuracy. This practice is common across most government organisations.

Overall, experience to date demonstrates that the utilisation of the e-Saram statistical function has influenced decision-making in other HRM-related areas. For example, if an individual with an English background is needed, the system allows for categorisation of civil servants by major degree, thus allowing to search for individuals with specific backgrounds and find the most appropriate ones for specific positions. Another example pertains to the Ministry of Foreign Affairs (MFA), which handles a significant number of high-ranking public officials. In this instance, statistics are used to determine the availability of vacant positions for high-ranking officials and future expectations. Such data significantly influence promotion and other career-related decisions. Moreover, since gender quotas for high-ranking public positions are in force, gender-related statistics also prove very useful.

Figure 10: Screen for statistical function of e-Saram

공무부서	직급	세부직급	계급	합계	남자	여자
합계				595	308	256
정무직	총계			3	3	
	차관			1	1	
행정지원직	총계			580	304	255
	총계			514	287	226
행정지원직	고위공무원			11	9	2
	3급			11	9	2
	4급			22	12	10
	4.5급			35	42	13
	5급			152	88	66
	6급			129	54	75
	7급			88	43	44
	8급			32	25	7
	9급			14	7	7
	연가			1	1	
연가사			1	1		
연가			16	9	7	
가용			5	4	1	
나은			10	5	5	

Rotation is another function handled by e-Saram as the law mandates that public employees rotate every three years, although it is not obligatory. Since rotation is not obligatory, the e-Saram does not send push notifications for rotation. However, statistics are available – utilising certain filters – to sort employees in a department by length of service, ranging from the longest to the shortest. In this manner, if a rotation list is needed, it can be generated from e-Saram using the filter function.

Training records of public employees are also part of the e-Saram. All specific training programmes that public officials must undergo are recorded in the system.²⁰ As of 2022, all educational websites providing training courses were integrated into e-Saram. While further refinements are conceivable, this integration has substantially alleviated the need for manual data entry of public employees' training activities resulting to improvements in operational efficiency. If previously, manual data entry entailed a daily workload of one to two hours by HR managers, it now takes approximately ten to fifteen minutes. This notable enhancement has resulted in a considerable reduction in time and effort expended on this task.

²⁰ In Korea, civil servants must complete mandatory educational training to advance in their careers. The training hours vary by department, typically ranging from 80 to 100 hours. Although the term «mandatory» lacks punitive measures for non-compliance, completion of these hours significantly impacts employees' promotion prospects and contributes to their performance evaluation. Delays in submitting performance goals or completing trainings are common. To address this issue, reminders are sent, sometimes daily, to keep employees informed about their progress and encourage timely completion.

A notable function of e-Saram – that other countries may find valuable – is that government officials who have undergone training abroad cannot retire or leave their positions for a specific period, by law. The system enforces the rule by notifying such individuals when they attempt to initiate the leave or retirement request processes.

Additionally, e-Saram has digitised the individual performance assessment process, a task that government officials must undergo twice a year.²¹ Digitising this process has significantly saved time for both employees and administrators responsible for performance evaluation.²² It is worth noting that in case of performance re-evaluation, the process is handled independently of the e-Saram; all requests and subsequent communications are conducted through email.²³

The e-Saram also handles functions related to awards and penalties.²⁴ In the case of awards, the system records two key pieces of information: (i) date an employee received award; and (ii) department responsible for granting award. This is crucial information, as regulatory requirements prevent individuals from receiving the same award for a specific period (usually three to five years). Additionally, the record of awards may be used by awardees to potentially offset penalties they may incur. With respect to updating information in the e-Saram, if the award is granted within a ministry or a government organisation, the relevant information is directly uploaded into the system. However, if the award is granted to an employee in a different department or organisation, awardees must notify their organisation so they can upload all related information into the system. Conversely, when it comes to penalties, the system captures the following information: (i) date of penalty; (ii) reasons for it; and (iii) its severity.²⁵ Recording penalty-related information is essential because it may have significant consequences, including a salary reduction, and/or a negative impact on promotion prospects.

²¹ Performance evaluation procedures differ by rank of public employees. It is also worth mentioning that performance evaluation primarily influences promotions rather than payroll, although in the case of Rank 1 to Rank 5 civil servants, it may also result to payroll adjustments (there are nine ranks of civil servants; Rank 1 the highest and Rank 9 the lowest). In other words, for senior or high-ranking public officials, performance evaluation scores impact their payroll directly. In case of exemplary performance, these officials receive bonuses in addition to their regular compensation. For other civil servants, their performance evaluation primarily affects their promotion prospects.

²² Generally, the individual performance assessment consists of the following procedures: (i) Qualification Assessment: Eligibility for performance appraisal is established based on specific timeframes, such as a requirement for employees to have worked at least two full months (for example, if evaluation takes place in July, the duration of the work of the employee from the period January-July need to be full two months); (ii) Employee Data Input: Eligible individuals are responsible for entering their performance data into the application in the e-Saram system; (iii) Department Head Review: Subsequently, department heads review the performance assessments submitted by their employees. To enable department heads to evaluate their subordinates' performance, HR managers perform a critical matching procedure in the system; and (iv) Final Evaluation Check: Following completion of performance assessments at all levels, a comprehensive evaluation check is performed to ensure adherence to the predefined criteria and guidelines.

²³ It is common for government employees to disagree with their performance evaluation results. In such instances, they have the option to submit a complaint form and request a re-evaluation by senior management. In most cases, however, re-evaluation requests often yield minimal changes in evaluation scores. This is largely attributed to the ranking system. Altering the performance evaluation score of one employee can significantly impact the ranking of other employees.

²⁴ Public civil servants can be recognised and rewarded through various means, including Public Service Awards, Long Service Awards for dedicated individuals, and Ministry-Level Awards specific to each government department. Outstanding public servants may also receive the President's Commendation for distinguished service and contributions to the nation. Additionally, merit-based awards are often granted to individuals who demonstrate exceptional accomplishments or leadership. Regarding the assignment of awards, the process can vary. It can be initiated from top management to lower levels or vice versa. In the case of significant awards, senior managers may create a list of candidates, which is then checked for eligibility. For other awards, each department may nominate candidates, and the eligibility of these candidates is verified before compiling a list of eligible awardees.

²⁵ Penalty records are manually entered into the system.

The e-Saram does not handle recruitment as such, as the MPM handles the recruitment of government officials through comprehensive national examinations. The involvement of HR managers is focused on addressing specific requirements only. These requirements may pertain to a limited number of positions (typically one or two), non-regular appointments, government officials with short-term assignments, or individuals with specialised skills, as these cases are not covered by the MPM's recruitment process.

Coverage

The e-Saram is responsible for the integration and administration of data pertaining to personnel matters, compensation, performance assessment, education and training, and other HR-related services for approximately 400,000 public servants across 70 central administrative government departments and agencies (as of November 2023), encompassing all public officials irrespective of their rank.²⁶ For instance, during the hiring process, submission of personal consent forms, and other required documents, is mandatory for all employees.²⁷ There are no distinctions or special security measures in place for high-ranking or lower-ranking employees during the hiring process. In addition to public servants, approximately 6,000 HR managers and 1,000 financial managers use the e-Saram.

Integration

The introduction of the second-generation e-Saram allowed for the integration of 70 distinct institutions than previously maintained separate and unique systems.²⁸ In 2011, hardware, databases, and applications (software) were integrated into a unified system that resulted to the enhancement of information resources operation and management.²⁹ Nowadays, e-Saram is the central human resource management electronic system for public servants and a comprehensive repository and authoritative source of information for administrative functions. However, due to strict legal regulations, integration of data such as social security numbers, addresses, names, etc is not allowed, although it is technically feasible. e-Saram is also integrated effectively with parallel systems, e.g., Insarang, and NEIS.³⁰

The integration process faced significant levels of complexity, given the involvement of 70 different institutions, which until then operated their own unique systems independently on separate servers and adhered to distinct ministry-specific regulations. Thus, the seamless integration of these different systems of different organisations into a unified e-Saram framework was a primary objective at the time. Despite these complexities, integration was a success story that stands out as a remarkable achievement in streamlining and harmonising the operations of these diverse entities and their systems under a common platform.

²⁶ It includes thirteen minister level organisations, nineteen ministries, six agencies, nineteen offices, and thirteen provisional committees.

²⁷ The hiring process cannot be completed without submission of the personal consent form.

²⁸ In total, 180 distinct systems were seamlessly integrated into e-Saram, establishing e-Saram as a comprehensive repository and authoritative source of information for various administrative functions.

²⁹ Integrating the various databases involved several essential steps: (i) Settlement of Data Exchange Rules: determine how long data will be exchanged, what type of data and in what format. This step set the stage for the integration process; (ii) Recipients' Request: potential recipients of the data must submit a request specifying their data needs; (iii) Institutional approval: institution responsible for the data sends an approval for sharing requested data; (iv) MOIS approval: The approved request is sent to the Ministry of the Interior and Safety for additional approval; (v) Development process (if necessary): any development processes required to facilitate integration are carried out at this stage. Technically speaking, it is possible to achieve integration in a single day. However, considering that the above-mentioned processes need to be completed, the integration takes about a week to complete on average.

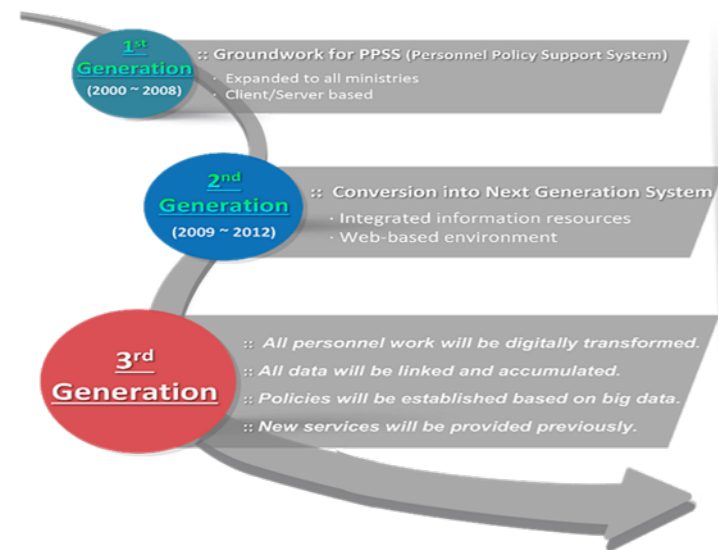
³⁰ Separate systems also exist. The "Insarang", operated by the Ministry of the Interior and Safety (MOIS), handles personnel management of local government officials, because of the division of responsibilities among different ministries. The NEIS, managed and operated by the Ministry of Education for teachers and educational officials, is also distinct from the e-Saram. In addition, the Ministry of Defence operates its own internal system, and it is not directly integrated with e-Saram.

This extensive integration significantly enhanced efficiency and coordination across the public sector, facilitating the exchange of vital data and ensuring a harmonious operation. For example, the integration of payroll and family information into the Government24 – the One-Stop Civil Service Portal.³¹ Any changes made to the information contained in the portal, automatically update the family and payroll related modules in the e-Saram, ensuring accuracy and consistency.

User participation and involvement

In ensuring active user participation in the e-HRMS development and implementation stages, the Ministry of Personnel Management conducted a series of interviews and collaborated with HR divisions across ministries. It also conducted a comprehensive survey among all e-HRMS users. They all focused on addressing challenges faced with the first-generation system and collecting requests and recommendations from HR managers at the same time. In parallel, the Ministry facilitated implementation by providing necessary information through public relations sessions that involved central ministries, agencies, and other relevant organisations, placing emphasis on the benefits of developing an electronic personnel record management system, while at the same time highlighting the importance of the data protection and security principles incorporated into the system. This holistic approach aimed at fostering a conducive environment for seamless implementation and integration of the second-generation e-Saram across government ministries and agencies. In addition, the Ministry of Personnel Management held a two-day session, in 2022, involving all HR managers to discuss the features of the system and inform the development of the third generation of e-Saram; currently under way.

Figure 11: Major changes by e-Saram generation



Training and support

Upon entry into a government organisation new employees undergo a comprehensive orientation on system usage that spans over three to four weeks approximately. This orientation includes instructional videos that delineate where and how data should be input in the system and the appropriate methods of doing so. Additional training is also provided by their predecessors during the handover period. Comprehensive training on the e-Saram system is also regularly provided by the MPM in a formal manner. Typically, two-day training sessions are conducted at the beginning and at the middle of the year.

³¹ https://www.dgovkorea.go.kr/service1/g2c_01/gov24

Furthermore, informative booklets containing supplementary material are readily accessible through Customer Service. While most processes are well-covered, approximately 20% of tasks - particularly those concerning penalties - lack corresponding instructions. In such cases, employees can request assistance from the Customer Service team that promptly offer guidance and support through email and/or telephone. In situations, where certain aspects remain unclear, direct communication with certain departments is available for specialised support.

Support is provided through Customer Service, which includes a Call Centre. In addition to the call centre, a website is available for submitting requests for specific issues. Responses to website requests are typically rapid, often within an hour or by the end of a working day. Responses are usually provided by direct telephone calls from Customer Service employees. An FAQ (frequently asked questions) section is also available, and it is regularly updated to provide answers to popular queries. Users are encouraged to check the FAQ section before making requests for support.³²

Data Protection and Privacy

The e-Saram system handles a substantial amount of personal information, which necessitates stringent access controls and security measures. To obtain personal data, it is mandatory to secure the individual's consent by means of a personal consent form. Additionally, distinct regulations are in place to govern access to different categories of data. Concurrently, in alignment with increased emphasis on personal information protection, the system bolsters the encryption of sensitive personnel data, and it possesses a refined authority structure as part of the system integration process. The stringent privacy regulations in Korea contribute to high data privacy standards. As a result, the integration of certain systems with e-Saram, although technically feasible, faces challenges due to these strict legal requirements.³³

Access to data involves a comprehensive security clearance process designed to restrict access to authorised personnel only. Data can only be accessed through a secure private network exclusively available to government officials.³⁴ Requests for connection are vetted by the National Intelligence Service,³⁵ ensuring the stringent security measures are consistently upheld and that access to this private network is meticulously restricted to authorised public officials only.³⁶ User authentication and authorisation for accessing data requires registration with the system for obtaining an ID and password, a privilege extended exclusively to public officials. While individual personal laptops can be used for signing in, this access is restricted to within the specific network (intranet) environment.

³² It is worth noting that, in terms of user-friendliness, while the system's layout may not adhere to a strictly linear structure, its search functionality is highly commendable. Users can efficiently retrieve pertinent data and information by entering specific keywords.

³³ In 2011, the Personal Privacy Protection Law was enacted. Article 1 (Purpose): The purpose of this Act is to provide for the processing of the personal information for the purpose of enhancing the right and interest of citizens, and further realising the dignity and value of the individuals by protecting their privacy from the unauthorised collection, leak, abuse or misuse of personal information; <http://koreanlii.or.kr/w/images/O/Oe/KoreanDPAct2011.pdf>

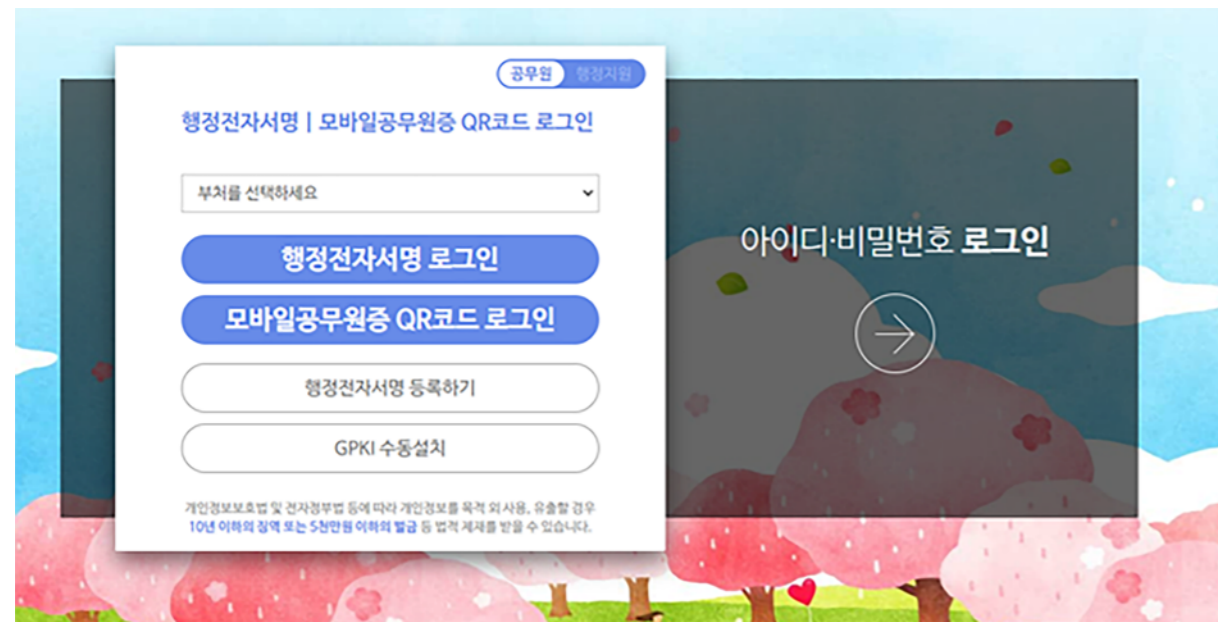
³⁴ Regarding the connection between the internet and the secure private network, a server gateway exists for the purpose of handling the communication and access is rigorously controlled and limited. Accessing the private network involves a comprehensive security clearance process, designed to ensure that only authorised personnel with a legitimate need can enter the private network. This procedure is integral to safeguarding the integrity and confidentiality of sensitive information.

³⁵ <https://eng.nis.go.kr/>

³⁶ To access this network, public officials are required to use specially configured laptops equipped with dedicated software. Upon logging in, the security protocols are automatically enforced, maintaining a high level of security on any computer they use.

The system employs a Public Servant Verification System to manage user authentication and authorisation. This system issues certificates that are mandatory for gaining access to the platform. However, alternative methods are also available. Overall, there are three primary methods for signing in: (i) Government Public Key Infrastructure (GPKI): This method serves as one of the authentication options;³⁷ (ii) ID and Password: An alternative means of logging in; and (iii) QR Code: A QR code-based option is also provided.³⁸

Figure 12: Screen for user authentication



Within the system, access is granted to specific roles, notably human resources (HR) personnel and those responsible for payroll management. In the context of performance evaluations, relevant information is shared with the respective employees and examination teams. It is important to emphasise that not all information is universally accessible. Instead, selective access is provided, granting limited information that pertains exclusively to the relevant department or designated individuals, including examination teams or other specific parties.

Nevertheless, there may be exceptions to these regulations, particularly for the MFA personnel stationed abroad. These exceptions likely consider the unique circumstances and security requirements of MFA personnel operating in foreign locations, allowing them to use the system under different conditions.

The Personal Information Protection Commission plays a crucial role in safeguarding personal information and preventing breaches.³⁹ This Committee is responsible for protecting individuals' personal data and ensuring that their privacy is not compromised. In the event of information leaks, the Commission investigates and imposes penalties and punishments. It operates within a framework of policies and relevant laws, offering support for information protection to organisations and addressing information leaks in the media.

³⁷ <https://www.gpki.go.kr/main/PreMainAction.action>

³⁸ It is important to note that individuals must seek approval from network administrators to use either of the first two authentication methods.

³⁹ <https://www.pipc.go.kr/eng/index.do>

For individuals affected by information leaks, there is a dedicated website where they can report such incidents. Whether it is a case of hacking or the unintentional disclosure of personal or corporate information, affected individuals can file reports on the website. Subsequently, Committee members conduct examinations and investigations. If the breach is attributed to system vulnerabilities, security measures are implemented. In cases where individuals fail to comply with data protection rules, the Committee decides on appropriate penalties and corrective actions. The core principles of personal information protection remain consistent irrespective of the government unit; they are all governed by the same laws on personal information protection. Chief Privacy Officers (CPO) are designated in each ministry responsible for upholding data privacy.

Benefits of the system

The system significantly enhances work efficiency through various functions as stated by HR managers. Functions like filtering, statistics, and categorisation play a crucial role in improving work efficiency. For example, filters within the system are instrumental in streamlining leave-related processes. As well, the system now provides disaggregated statistics for men and women, making it considerably more convenient, specifically in maternity or paternity leave calculations. Previously, there was only one category for all. The system now offers automatic categorisation for newly hired employees based on factors such as educational background, majors, and gender. This categorisation proves valuable in making human resource management decisions, especially concerning hiring.

Challenges and Limitations

The challenges during system integration implementation included concerns about data overlaps between government organisations and data ownership. Furthermore, during the development of the second-generation e-Saram significant consideration of the seamless migration of data from the first-generation e-HRMS was given, ensuring a seamless transition without downtime and uninterrupted user access.

Additionally, in the early stages of the first-generation e-Saram, the primary challenges faced included the digitalisation of paper documents - for this, extensive BPR was conducted to address such issues, drawing inspiration from private sector practices. Another significant challenge was resistance from individuals, primarily due to concerns about confidentiality when all relevant information is consolidated into a single system.

The development of the second-generation of e-Saram encountered minimal technical challenges. However, it faced hurdles, primarily in the domain of laws and regulations. The system was continually adapted to changing policies and regulations, presenting formidable challenges with respect to the system's adaptability.⁴⁰

Notable differences exist in the hiring process in Korea compared to other countries. In Korea, information for a new employee is input manually initially, whereas in other countries this information can be obtained using the individual identification number (IIN) of an employee and through integration with other government systems, eliminating the need for manual data entry.⁴¹ The level of integration of the e-HRMS in Korea could easily allow such retrieval of data from other systems and databases. Yet, there is no such intention due to data privacy concerns. However,

⁴⁰ It is worth noting that similar issues related to changes in rules, laws, and regulations are prevalent in other countries. One of the notable issues is the system's inability to quickly reflect these changes.

⁴¹ This unique process utilised in Korea is influenced by regulations and operational structures. While there is a personal consent form that new employees must sign, Korea handles various personal information through different departments. For instance, certain information required for hiring may be managed by a legislative branch, even if the individual is from the executive branch. Access to specific information is limited to the relevant department handling that data.

Korea is trying to solve the problem of data integration in the hiring process through the 3rd generation that we are currently in progress.

Another challenge faced is related to rotation. Every three years, HR managers transition to a new position and a new team, which is usually accompanied with changes in assigned tasks performed. Ideally, the transition should include training to prepare them for their new roles. However, in practice, this training does not occur consistently. Consequently, newly transferred employees find themselves working with the system and managing data before they receive the necessary training, which can lead to mis-entries and errors. A single mistake can have far-reaching effects on subsequent records and processes, highlighting the importance of comprehensive training during the transition period.

Currently, the primary objective of the e-Saram development and operational capacity is to attain more integration and flexibility across the various systems deployed by different ministries and government agencies, consolidating them into the e-Saram system. More databases integration will also assist in achieving this objective. Moreover, there are plans for improvements that were highlighted during a two-day session held in 2022, involving HR managers, on the development of the third-generation e-Saram.⁴²

⁴² Areas for improvement suggested were: (i) Limitation on open pages: only up to ten windows / pages may be open at any time currently while working with e-Saram, a limit considered insufficient; (ii) Connectivity issues: connectivity issues detected, especially when following specific steps or processes while hiring new employees, as the system's current configuration does not support sequencing, necessitating to managing the order manually; (iii) Systemic processes: it is observed that the system lacks support for systemic processes, such as payroll management; (iv) Growing demand for data: with e-Saram becoming more relevant in HRM processes, demand for more data is increasing – approximately 20 to 30 institutions request data from the system annually – thus more integration of databases is expected; (v) Access to personal information: A notable concern was the segregation of personal information handling across different departments. HR managers pointed out that they may require access to specific information managed by other departments, which necessitates navigating department-specific networks. Therefore, having access over all initial data to optimise the hiring process was requested; (vi) Individual Performance Assessment: Discussions during the session inquired into the individual performance assessment, particularly the assessment criteria tied to activities and contributions. Consideration was given to factors such as appointment allocation and their impact on performance evaluation; (vii) Training needs: As was mentioned previously, every three years HR managers have rotations. Thus, the need for training prior to using the system was deliberated during the session; (viii) Feature Enhancement: A suggestion was made to include a feature in the system that offers guidance on how inputted information influences other data aspects. For instance, the system could generate pop-up messages providing insights into how, for example, appointment-related information affects other data categories, enhancing user comprehension and data accuracy.

Kazakhstan

Brief description

The integrated information system “e-Qyzmet” is an electronic system designed to fully automate human resource management in the civil service, in the Republic of Kazakhstan. It serves as a unified database of all administrative civil servants, streamlining every aspect of their journey from recruitment and entry into the civil service to retirement. E-Qyzmet comprises over 400 distinct business processes that implies a high coverage of HR procedures across various state agencies.⁴³

The e-Qyzmet was established between 2013 and 2015, marking the initial steps towards digitising civil service personnel management with the purpose of consolidating personnel units into a nationwide network and automate their activities. From the outset, both modules for HR departments (main users) and civil servants (general users) were developed simultaneously. The system became operational in 2016 with nine blocks and 32 subsystems. Subsequently, it underwent continuous advancements until 2021, by incorporating new functionalities to align it with the evolving legislation of the e-HRM landscape. In 2022, the e-Qyzmet development trajectory took a significant turn entering a new development and modernisation phase. The e-HRMS underwent a comprehensive rebuilding process to address changing personnel management needs and consider the latest technological advancements. This modernization continued into 2023, emphasising the transition to full process automation eliminating the parallel paper-based document flow.⁴⁴

Also, in 2022, the development of an e-HRM mobile application began, to be completed by the end of 2023. Its main objective is to reduce processing time for document review and approval, which will be achieved through a self-service module that will eventually simplify the submission of leave requests and business trip memos by civil servants.

Overall, it seems that the initial goal of streamlining the work of HR units has been largely achieved through automation of many HR processes and efficiency improvements with respect to time spent on data entry and processing. Furthermore, emphasis is given on generating reliable statistics for better decision-making, that is the e-Qyzmet providing senior management with real-time information on the entire civil service workforce nationwide, by ensuring that all relevant data on civil service personnel is continuously updated and readily accessible through the system at all times.

Governance and Management

The main government body responsible for designing policy and coordinating implementation for the unified e-HRMS for the civil service is the Agency for Civil Service Affairs of the Republic of Kazakhstan.⁴⁵ The primary role of the Agency is to oversee and manage recruitment and other human resource functions in the public administration system of Kazakhstan. With the implementation of the integrated personnel management information system – e-Qyzmet – the Agency's role extends to ensuring the efficient and effective management of personnel-related information, processes, and services through a digital platform.⁴⁶

⁴³ There is an on-going effort to optimise these processes, with work focused on reducing the number of steps involved in completing them.

⁴⁴ For this purpose, more than 200 integrations have been executed between e-Qyzmet and external information systems since the inception of the former.

⁴⁵ Since its inception in 1998, this Agency has played a crucial role in overseeing various aspects of human resource management in state organisations, while being directly subordinate and accountable to the President of the Republic of Kazakhstan.

⁴⁶ The development of the e-Qyzmet system is grounded in the strategic vision of the Agency of the Republic of Kazakhstan for Civil Service Affairs, as outlined in the Strategic Plan for 2011-2015. It is also aligned with the principles of the Concept of the new model of civil service of the Republic of Kazakhstan, which was adopted in 2011. These documents set the objectives and provided the legal foundation for the development of the e-HRM system. Furthermore, the Law on Informatisation, and the Concept of Information Security of the Republic of Kazakhstan until 2016 inform the principles on which the e-HRM is built upon.

the Prosecutor General's Office, the system transfers relevant information to the appropriate authorities for analysis and action. Moreover, as many social programmes require verification of a person's civil servant status, e-Qyzmet provides such information and thus aiding in determining whether an individual is currently employed as a civil servant, has been dismissed, or is no longer eligible for certain programme benefits.⁵⁵

Furthermore, efforts are being made to develop integration that will allow the transfer of information to compile the time sheet. It will be used to transmit data about an employee's work hours for an entire month, their sick leave, or their business trip. The necessity for this integration arises because the system lacks the functionality related to wage calculation, which is currently computed and transferred independently to the «1C» accounting programme, without any interaction with e-Qyzmet. At present, the integration of the two systems is prevented by information security concerns, as the actual earnings of individual civil servants are considered confidential information intended for official use exclusively.

There are also intentions to integrate e-Qyzmet with the State Center for Pension Payments to access information about individuals' prior places of work that paid pension contributions and, hence, their employment history aimed at automating the population of the work activity section of their personal files with employment data.⁵⁶

Meanwhile, the need for integrating e-Qyzmet with the "Documentologist" – an electronic document management system – and with "e-Otinish" – a portal for official appeals to government agencies is perceived by HR specialists. Such integration would enable the tracking of each employee's workload based on the type of assignment, particularly for central apparatus employees responsible for executing presidential, administrative, and governmental directives, who often have varying workloads. Such integration would streamline workload calculations, enabling HR managers to monitor and report any uneven distribution of work to department directors. Currently, the process is performed manually, and it involves extracting data from various platforms, manually distributing it among employees, and then consolidating it into a single table for monitoring employee workloads.

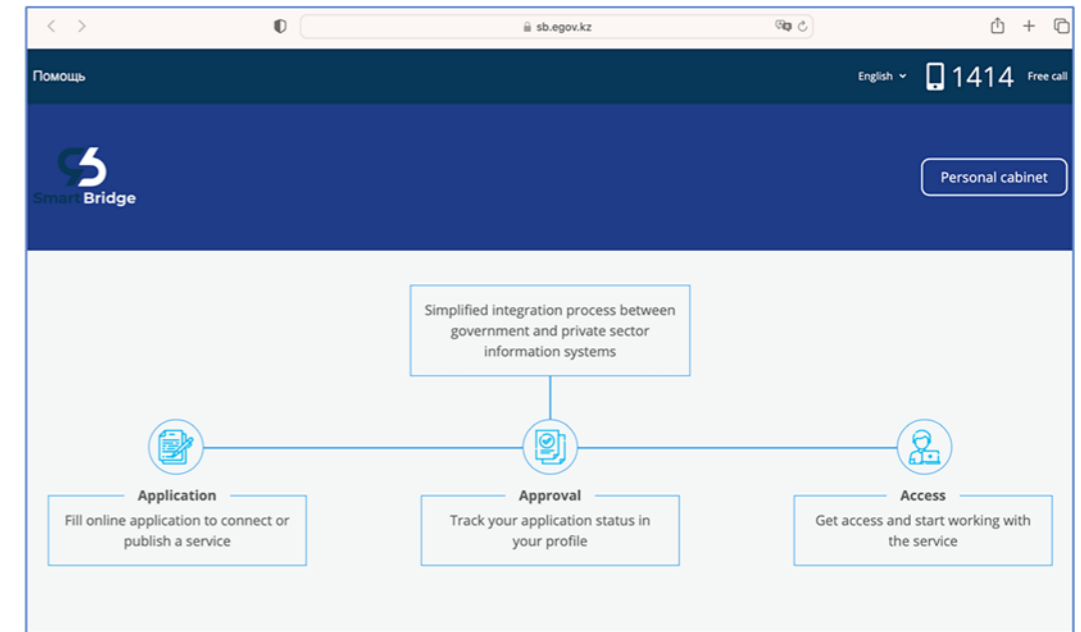
The integration of the different databases is administered by the "Smart Bridge" platform of the Ministry of Digital Development, Innovations and Aerospace Industry, where various services of all government organisations are displayed along with the description of their data. Any organisation, including non-governmental organisations, can apply using their business account for services they require. Once the data provider organisation approves the application, the operator of the e-government gateway – the National Information Technologies JSC – gives access to the requester (Figure 15).

If the requested services are on the Smart Bridge, no barriers are encountered at present. In general, approximately 80% of services and related data are available on the Smart Bridge. However, if a service is not available, the relevant government agency is approached to assess whether the service can be established for the e-Qyzmet. Ultimately, this depends on the funding, readiness, and presence of suppliers within the government agency which is reached out for integration.

⁵⁵ Future integration efforts entail several key initiatives. First, there are plans to exchange data with the Ministry of Finance to verify the submission status of mandatory annual declarations by civil servants, to be recorded in their personal files. Second, a two-way data exchange integration is being planned with the Ministry of Defence to eliminate the process of submitting quarterly reports on civil servants of military age, by e-Qyzmet obtaining information on their military ranks electronically. This initiative requires readiness on the part of the Ministry of Defence.

⁵⁶ It is noteworthy that under the Labor Code of the Republic of Kazakhstan extracts from the Unified Accumulative Pension Fund are among the documents validating work activity. Although such statements are not the primary means of verification, they are considered the most reliable source compared to the Unified Employment Agreements Accounting System, which is not mandatory and relies mainly on data from government organisations, lacking the necessary information from the private sector.

Figure 15: Integration process of information systems on the Smart Bridge Platform



Source: Smart Bridge, <https://sb.egov.kz/smart-bridge/home>.

User participation and involvement

HR Units' heads and specialists do not directly participate in the process of system development. However, their feedback and proposals are considered by the coordinating authority when updates or changes are initiated.⁵⁷ This process includes creating a methodology, determining legislative requirements, and obtaining approval, followed by registration with the Ministry of Justice. Subsequently, the Transformation and Digitalisation department shapes the actual system processes based on the established methodology. For the development and modernization of the system the collaboration involves the developers and the maintenance company of the E-Qyzmet, and a project management group established at the JSC «National Information Technology» overseeing the entire process. Thus overall, four parties work together to ensure clarity in implementation, when there is a need to address new requirements.

Training and support

Mandatory training is provided to all relevant HR Units employees with each new functionality introduced. Additionally, corresponding memos or user / administrator guidelines are developed and disseminated. Furthermore, as the system is currently undergoing extensive reconstruction, multiple in-person training sessions are already being organised to demonstrate how to effectively utilise the new system features, the skills that are required, and to provide other essential information.

The call centre is fully operational, allowing users to seek clarification on any issue, and the maintenance company is always ready to assist with any inquiries. If a proposal for modifications in the system is received from several government agencies and complies with existing legislation, it is considered for implementation to effect system changes. The duration for implementing such changes varies: minor adjustments typically take 2-3 weeks, while more substantial revisions can extend beyond a month.⁵⁸

⁵⁷ The Agency for Civil Service Affairs regularly receives suggestions from various government bodies regarding changes they deem necessary in the e-HRMS.

⁵⁸ As the Executive Office of the President is in the process of connecting to the e-Qyzmet system, a surge in change requests is anticipated, necessitating system adjustments. Consequently, it is deemed necessary to slightly expand the team responsible for processing requests. This expansion will enable the allocation of dedicated personnel for the specific task of formulating requests originating from the Executive Office.

Data protection and privacy

Data protection and privacy is safeguarded through a comprehensive system. To comply with information security e-Qyzmet, just as all other state systems, it operates in an isolated protected network - the Unified Transportation Environment (UTE). The UTE, secured at the state level, serves as the secure communication infrastructure for e-Qyzmet. All interactions among state entities take place within this protected environment, as mandated by legislation. To safeguard e-Qyzmet from unauthorised access, two key tools are employed:

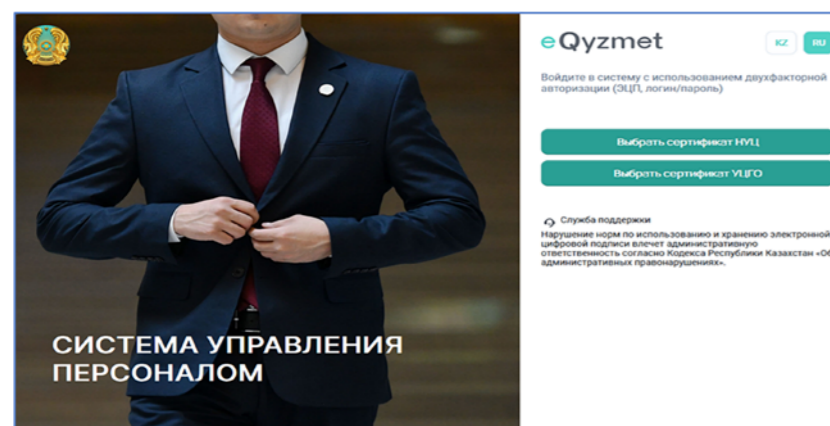
- A single transportation environment: This ensures that only authorised entities can access e-Qyzmet, thus preventing external intrusion.
- An e-government gateway: This secure gateway manages integration with various information systems, acting as a protective barrier to prevent unauthorised access to e-Qyzmet.

Access to information is tightly controlled at the functional level, with access granted based on specific roles.⁵⁹ For example, only personnel management service employees have access to the database. Individual public employees have access to their own data along with their immediate supervisors. Even within HR units, each user has a distinct role; one person may handle selection, another may focus on training, and someone else on personnel affairs. This approach ensures differentiation of access to information. Along with that, the Agency for Civil Service Affairs as the owner of the system has access to full statistics.

At the database level, personal data is encrypted, with the specific encryption criteria determined by the owner of the system – the Agency for Civil Service Affairs - further enhancing data security and privacy protection. Overall, this comprehensive approach ensures the security and privacy of data within the state digital infrastructure of Kazakhstan.

The user authentication and authorisation processes vary between the external and internal portals. For the external portal, it relies on the e-Government platform's Identity Provider (IDP), offering users multiple options for authorisation, including Digital ID, electronic digital signature, and login and password. For the internal portal (Figure 16), two-factor authentication ensures better security, as users provide login credentials and sign in with an electronic digital signature (EDS).

Figure 16: Authorisation page of e-Qyzmet



⁵⁹ individuals entering the civil service consent to the collection and processing of their personal data from other information systems, emphasising transparency and consent in handling personal information. This is also the case for candidates, who are asked for their permission during registration for automated processing of their personal data. Should candidates wish to withdraw this permission, they have the option to request the Designated Authority to cease accessing their data. Then, candidates receive a push notification or an SMS containing a code, which when entered into the system, halts any further personal data processing.

Benefits of the system

The e-HRM system's feature highly valued by policymakers is its data analytics capability. Previously, generating the annual report on personnel in the civil service required at least a week of laborious manual work by a personnel officer to collect data on the staffing of state bodies, its qualitative composition, education breakdown by majors, mentoring, training, internships, rotation, and more.⁶⁰ Nowadays, obtaining comprehensive data on the entire civil service workforce for the same report is taking just around 15 minutes, utilising the data analytics capabilities of e-Qyzmet.

In practice, however, errors occur due to incorrect or incomplete data. This is most probably caused partially by incorrect initial manual input of data into the system, as government agencies still rely upon numerous paper-based records for personnel management processes. These errors are also attributed to the fact that certain agencies remain unconnected to the system (Table 3) and data needed are manually collected. Additionally, discrepancies in statistics generated may arise as a result of varying methodologies employed by different organisations. For the purpose of unification, the Agency for Civil Service Affairs, in 2016, undertook the task of standardising electronic human resource management processes, which encompass the adoption of standard personnel record forms endorsed by the Agency.⁶¹

Table 3: Government agencies that do not utilise e-Qyzmet⁶²

Government body	Full-time staff positions
Executive bodies of the President of the Republic of Kazakhstan	414
Prime Minister's Office	656
Supreme Court	6,243
Ministry of Finance	14,647
Total number	21,960
% of total	≈ 29%

Conversely, one may argue that the introduction of e-Qyzmet has significantly relieved HR units from routine personnel work. All HR-related requests are now processed on-line leading to a significant reduction in time devoted to paperwork.⁶³ Consequently, it is assumed – as no specific evidence on such changes exists - that HR specialists have more time to focus on core HR duties rather than routine administrative tasks nowadays.⁶⁴

Furthermore, the recently introduced “Selection” module, which employs proctoring technology for observation and monitoring on-line testing has proven to be beneficial in several ways. This module enables potential candidates to take tests on-line at their convenience, irrespective of their location, eliminating the need to physically visit a testing centre. Considering the size of the country and travel distance associated with it, e-testing offers such benefits, as time and cost savings for candidates who no longer need to travel. It also reduces operational costs that are not incurred by the National

⁶⁰ «Monitoring the state of personnel in the civil service of the Republic of Kazakhstan».

⁶¹ Order No 27 (2016) “On approval of standard forms of documents for personnel records management of the administrative public service”.

⁶² At the time this report was being prepared, the Ministry of Finance and the Supreme Court were in the process of completing their full transition to the system. The remaining government agencies are scheduled to be connected by the end of the current year.

⁶³ These tasks are further enhanced due to the existence of an electronic archive, where all relevant files are stored and readily accessible, as the Archive is integrated with e-Qyzmet. The e-Archive is managed by the Ministry of Culture and Sports.

⁶⁴ However, despite the automation of a multitude of HR processes, government bodies continue to generate and retain certain HR related documents in paper format due to concerns about network connection stability and uninterrupted access to data - as observed during the events of January 2022. Additionally, legal requirements dictate that certain documents must be retained in paper form. However, these documents are digitally signed using an electronic digital signature (EDS) and are subsequently printed and archived.

Center for Civil Service Personnel Management for administering tests at testing centres. It is also expected that corruption risks will be reduced by eliminating personal interaction. However, this needs to be corroborated, in due course.

Human resources personnel perceive the e-Qyzmet system as highly efficient in various ways, benefiting different stakeholders. One significant advantage is the reduction in administrative work. For instance, the process of creating quarterly reports for the Agency for Civil Service Affairs involved manual data collection and analysis in Excel. However, as e-Qyzmet has automated this process, significant reduction in the time and effort required is observed. Moreover, the transition away from paper documentation, physical signatures for approvals, and manual distribution of documents has streamlined the reporting process, resulting in valuable time and resource savings.

The introduction of e-Qyzmet has also resulted to increased efficiency in HR processes. For example, it simplifies and advances personnel procedures, such as the issuance of vacation requests, which “now take only one day instead of an entire week.” Additionally, the adoption of the electronic document management system has also contributed to the efficiency of HR processes, as it has eliminated the need for paper-based documentation and manual tracking. Another major benefit of the e-HRMS is the significant time savings realised in data collection and reporting. Previously, it took personnel officers at least a week of painstaking work to gather and analyse information from various government agencies. Nowadays, comprehensive reports can be generated in just fifteen minutes.

The system enhances transparency and reinforces protection employee rights. For instance, it allows employees to track disciplinary processes and access all relevant documents, ensuring transparency in the process and protecting employees’ rights at the same time. According to the view of HR specialists, the system also ensures timely leave, objective work assessments, and promotes meritocracy, arguably allowing for fair evaluations of employee performance regardless of their relationship with management.

Furthermore, e-Qyzmet, as a centralised system, facilitates comprehensive oversight and assessment of employees’ progress across territorial divisions, and it simplifies talent tracking. It also enables objective evaluations and promotions to different divisions, fostering fairness and efficiency. Moreover, it provides better control and monitoring of departmental work, particularly in cases of layoffs, where the system helps identify the reasons and comprehensively assess the situation.

Lastly, the e-HRM system simplifies job searching and the application process. It provides information on open vacancies at various government agencies, making it easier for employees and candidates to search for government job vacancies. It eliminates the need for checking multiple agency websites and it reduces the paper load associated with job applications, as it used to.

Another important insight deriving from the analysis of the interview responses is that e-Qyzmet is having a significant impact on corporate culture and organisational outcomes in government organisations. For instance, the cultivation of trust and understanding of HR processes among employees, in contrast with the past, when HR Units were often seen as closed and opaque. HR processes have become transparent, allowing employees to be informed about decisions regarding promotions and other aspects of their careers. This does not only minimise misunderstandings, but it also encourages employees to take a more proactive role in their career development. As a result, a culture of openness and fairness is nurtured.

E-Qyzmet has also reinforced accountability, as it maintains a comprehensive record of all processes, eliminating past disputes for lost documents or delayed actions and it streamlines administrative procedures. Timeliness of requests or for performance assessments lies squarely with the employee, removing the need for monitoring by HR Units. Such features promote a sense of security for the HR Units’ teams.

The ability to create a variety of reports utilising the “Reports” module contributes to a more informed policy decision making process. For instance, a new remuneration system has been introduced in

a pilot mode in a number of state bodies. Statistical analysis of relevant data in the e-HRM platform has shown that institutions implementing the new civil service compensation system are attracting a higher number of candidates with master’s and PhD degrees, as well as individuals with foreign education backgrounds. Undoubtedly, this is a contributing factor to improving the overall quality and composition of the staff. For this reason, a memo has been drafted by the Agency for Civil Service Affairs for the President, proposing the extension of the pilot remuneration system to the entire civil service.

Challenges and limitations

E-Qyzmet faced several notable challenges from the beginning. There was significant resistance from civil servants to work with the system.⁶⁵ This resistance led to another early challenge: a heavy reliance on personnel specialists to manage the system on behalf of all employees, even though the e-HRMS aimed at empowering civil servants to independently handle their HR-related tasks. Overcoming these challenges required a concerted effort to enhance the system’s functionalities and its user-friendliness; gradually changing the situation over time.

Another challenge is managing a list of logins and passwords for each employee, as it poses considerable security risks and administrative burdens, when dealing with a large workforce. While centralisation in human resource management has helped address this challenge, primarily at the central level, there are still instances where a designated individual within a local government entity manages system-related tasks on behalf of the staff.

E-Qyzmet system also faced several significant drawbacks and challenges from a technical perspective. First, its original architecture, designed in 2013, was monolithic and thus it lacked flexibility. Even minor updates required extensive system overhauls, limiting adaptability, and impeding efficient maintenance. However, the new version under development takes a different approach, for example, there are separate services for different new functions, e.g., a proctoring system for monitoring on-line entry test, and a separate system for test administration. Another challenge and a notable shortcoming is the absence of a hot reserve infrastructure, which enables immediate and seamless backup activation in case of a system failure. Although a cold reserve is available, manual intervention is required to restore system functionality in the event of failures, potentially causing downtime and operational disruptions during critical situations.

Furthermore, old infrastructure which has remained unchanged, despite the significant advancement of the e-Qyzmet since 2015, e.g., the introduction of the “Selection” module, that has added extra load to the system causing system freezes. Such frequent interruptions in connectivity often lead to situations where HR professionals are unable to perform transactions and complete tasks on time, e.g., arranging a business trip. As a result, they revert to paper-based documentation processes leading to subsequent duplication.⁶⁶ Nevertheless, as part of the development and modernization of the system, work was carried out to transition from physical servers to virtual ones with large resources, which led to higher system performance.

Lastly, concerns regarding data reliability have also emerged. While errors were acknowledged, it was noted that they were mainly due to incorrect initial data input. In such cases, it is essential for the e-HRMS to incorporate features that enhance data accuracy, including built-in checks and validations to reduce the risk of errors associated with manual data entry.

⁶⁵ A common hurdle when introducing new technology into organisations, often stemming from unfamiliarity with the system or a perception of added complexity in their daily tasks.

⁶⁶ Internet instability also remains a challenge throughout the country, a situation beyond the immediate control of the e-Qyzmet system administrators. Nonetheless, proactive steps have been taken from the Agency’s side to draw attention to this matter through written correspondence and communications, underlining the adverse impact of unstable internet and inadequate infrastructure in Kazakhstan on the advancement of information systems, including e-Qyzmet. The authority responsible for resolving such issues is the Ministry of Digital Development, Innovations, and Aerospace Industry (MDDIAI).

In addition, for swift decision-making a functional analysis is considered essential to determine the currently required positions, necessary specialists, and competencies in demand. It would also be beneficial for HR units to identify positions with the lightest workloads or those no longer needed within a government agency for optimisation purposes. Presently, these processes are carried out manually, involving the assessment of job roles, workload evaluations, alignment of duties with the functions of a state body, and identification of potential areas for optimisation.

While overseeing disciplinary actions is considered to be a well automated HR activity in e-Qyzmet, personnel rotation between government departments still requires facilitation. Indeed, as reported by HR heads, currently, they manually record the deadlines for each employee subject to rotation. Recognising this need there is a plan to incorporate a specific function into the system: when a civil servant of a specific category approaches their three-year tenure in their current role, the system automatically generates a notification, informing an HR specialist that the rotation time is approaching. It then provides a visual representation on a map of the state agencies where rotation is feasible.

In terms of work-life balance, there is a legal provision for flexible working hours; however, remote work is not a common practice in the civil service, and thus, not integrated into the e-Qyzmet. While a talent management function is not currently available in the e-Qyzmet, its potential introduction is viewed as potentially beneficial for HR departments. In situations where two highly qualified candidates are available for a single position, HR staff often make informal notes about the second candidate and subsequently reach out to them in the future when new positions become available. If this process could be incorporated into the system through a roster, and candidates automatically received notifications about new positions, it would lead to a more efficient workflow for HR specialists.

Additionally, the system does take into account diversity by providing an adaptation for visually impaired users. It includes a feature where users can switch to a visually impaired-friendly mode. This demonstrates a proactive approach to ensuring inclusivity and accessibility for individuals with visual impairments, making the system more user-friendly and accommodating to a wider range of users.

Currently, the utilisation of AI technologies is in an exploratory stage, mainly for recruitment and selection, rather than for facilitating other aspects of personnel management. Thus, systematic data collection is on-going to facilitate future machine learning applications that will be incorporated into the e-Qyzmet. Such applications would serve a dual purpose, assisting government agencies in identifying suitable candidates and helping candidates discover positions conducive to their career advancement.

In sum, although e-Qyzmet has notably improved many HR routine processes and has introduced certain analytical capabilities, the system appears to lack the tools necessary for HR units to evolve into strategic partners for HRM policy and implementation. According to HR department heads, certain strategic tasks demand time-consuming manual work, even for experienced HR managers. While the system does contain regulations, mission statements, and tasks for state bodies, the determination of specific departmental needs for specialists, encompassing their education, experience, skills, and competences, is primarily reliant on the expertise and skills of HR managers and is not supported by the system. Consequently, for moving forward, future goals of the e-Qyzmet encompass advanced analytics and customised reporting capabilities to support data-driven strategic planning within the civil service and optimise policy formulation and implementation.⁶⁷

⁶⁷ The allocated budget for the e-Kyzmat development for 2022-2023 is about KZT 440 million, approximately USD 100 million, constituting around 0.039% of the GDP.

Kyrgyzstan

Brief description

In 2016, the State Agency for Civil Service and Local Self-Government Affairs – hereafter the Agency – was assigned with the task to create a database of government and municipal civil servants. In 2017, the initial version of the “e-Kyzmat” – thereafter, e-Kyzmat – consisting of the first two modules – “Personnel Management” and “Organisational Structure” – were developed and piloted in four government bodies, the Agency, the Ministry of Digital Development, the Kyrgyz Patent Office, and the Jogorku Kenesh (Supreme Council).

In January 2018, the second and current version of the e-Kyzmat was released. By 2019, all government organisations were connected. First, the central government organisations followed by their subordinate ones, and territorial divisions. The next stage (2020) involved the connection of local governments – mayors’ offices, akimats, etc. The widespread transition to the “InfoDocs” Electronic Document Management System (EDMS) in 2021-2022,⁶⁸ which is now directly connected with the e-Kyzmat has also enabled private organisations to begin connecting to the e-Kyzmat system for a fee.

The recently released “Strategy for Personnel Policy 2026” contains actions to modify and improve the e-Kyzmat system. For example, there are plans to create the “Electronic Employment Record Book”, the “Electronic Staffing Table,” and the “User Personal Account” modules.⁶⁹ There are also plans to develop the “Analytical” module for generating and providing statistical information, so the system can also be used as a decision-making tool.⁷⁰

The overall goal of e-Kyzmat is to enhance the quality of personnel management in the civil service by automating HRM processes and facilitating the collection, processing, utilisation, and exchange of personnel data based on the principles of single entry and multiple data use.⁷¹ Ultimately, the e-Kyzmat aims to digitise all data, move to a completely electronic environment for real-time reporting and serve as a decision-making tool.

Governance and Management

The e-Kyzmat is governed and managed through a collaborative effort involving various stakeholders. Ownership and coordination rest with the State Agency for Civil Service and Local Self-Government Affairs, which assumes the role of the system owner. This agency is tasked with leading legislation-

⁶⁸ «InfoDocs» is an electronic document management system that automates processing of documents – external and internal - in government agencies, their territorial divisions, and local governments, as well as to manage and maintain an electronic document archive.

⁶⁹ The “User Personal Account” module is designed to provide access to civil servants’ personal profiles where their information is entered by employees of personnel management units on seniority, wages, paid taxes and deductions, the expected amounts of pension. They will also be able to access an application to enrol for participation in open competitions for the internal personnel reserve of state and local government bodies. The “Electronic Employment Record Book” module is designed for users to enter data on work activity, and summary information about their work experience; all without maintaining a paper version. The module “Electronic staffing table” will introduce limits on the number of staff positions, i.e., the number of appointments cannot exceed the maximum number of employees determined for an organisation. The development of this module is almost complete; however, its main user – the Ministry of Finance – have submitted some proposals for improvement. Moreover, no piloting of the module has begun, as the accounting systems have not yet been developed.

⁷⁰ The terms of reference for the “Analytical” module were being finalised in May 2023, when interviews were taking place.

⁷¹ This approach ensures that once data is entered, it serves multiple purposes, thereby increasing processing speed and enhancing the relevance and integrity of the information.

based policy decisions, setting objectives, and coordinating with the developer company.⁷² The development and maintenance of the e-Kyzmat system are overseen by the “Infocom” State Enterprise, a subsidiary of the Ministry of Digital Development. Infocom’s team, including programmers, analysts, and system administrators, collaborates with the Agency in preparing terms of reference, describing business processes, and developing new modules or refining existing ones.⁷³

The development team within Infocom comprises 35 software developers. In routine operations, a smaller team of six individuals, including software developers, analysts, and a designer, is engaged. Task distribution is managed by the chief developer, with roles assigned for front-end and back-end development, API preparation, and design improvements. Infrastructure management, including hardware needs, falls under the responsibility of Infocom’s Infrastructure Management Unit (IMU). The system servers are housed at the Data Centre at Infocom and managed by Infocom.⁷⁴ The system operates within a closed network, utilising VPN channels and specific certificates for communication. External modules, such as the «Distant Learning» module, communicate through the government gateway.

Functionality

The e-Kyzmat system primarily functions as a unified database of civil servants handled and managed through two fully operational blocks – the “Personnel Management” and “Organisational Structure” modules. The former comprises personal information about each employee, including personal data, education qualifications, orders, and awards. This module tracks records of all changes regarding public servants from the time of their appointment. Information is entered by employees of the personnel department based on an order of appointment and the personal sheet (file) of each employee, if previously stored on paper. Over time, any awards received by employees are also documented in the system, along with other orders associated with business trips, vacation, etc. The “Personnel Management” module also records and tracks working time, work location, whether at the office or on a business trip, vacation time, sick leave, etc.

The “Organisational Structure” module contains the names of the state organisations, their divisions, departments, positions, overall staffing numbers, including those of their territorial subdivisions, if applicable (Figure 17). Thus, the module serves as a structural framework for the organisation, playing a vital role in the seamless operation of the «InfoDocs» Electronic Document Management System, which is closely integrated with e-Kyzmat; data from the “Organisational Structure” and “Personnel Management” regarding employees’ presence or absence at work is immediately transmitted to InfoDocs. If, according to the e-Kyzmat system, an employee is on vacation, the ability to send them documents for execution in the EDMS will be promptly disabled with a respective notification to the management. Moreover, any changes in personnel status, such as dismissals, reassignments, or transfers to another government body, are instantly communicated. Therefore, e-Kyzmat ensures an accurate and real-time information flow for uninterrupted documentation update of InfoDocs.

⁷² Decree of the Cabinet of Ministers “On the Action Plan for the Implementation of the National Development Programme of the Kyrgyz Republic until 2026” No 352 (25.12.2021) contains provisions for the e-Kyzmat system.

Decree of the President of the Kyrgyz Republic “On the National Development Programme of the Kyrgyz Republic until 2026” No 435 (12.10.2021) contains tasks for the implementation of the e-Kyzmat system, e.g., how to develop the electronic staff list, budget amounts, and step-by-step actions, and deadlines. The Regulations “On the automated information system for human resource management in state bodies and local governments of the Kyrgyz Republic “e-Kyzmat” were approved by Resolution of the Cabinet of Ministers of the Kyrgyz Republic No 120 (11.03.2022).

⁷³ The terms of reference are subject to approval by the Director of the Agency, guiding the subsequent implementation by the developer.

⁷⁴ Regarding data management, each government agency owns its data, but the technical operator, Infocom, is responsible for its physical storage. The data is housed in a cloud system accessible to government agencies, with each organisation’s data occupying a designated part.

Figure 17: Organisational Structure module

Отдел	Куратор	Количество должностей	Количество сотрудников
Руководство	Руководитель государственного органа, находящегося в ведении Президента	7	7
Отдел организации и координации статистики	Руководитель государственного органа, находящегося в ведении Президента	3	5
Управление экономической статистики и национальных счетов	Руководитель государственного органа, находящегося в ведении Президента	3	4
Отдел системы национальных счетов и экономических балансов	Руководитель государственного органа, находящегося в ведении Президента	4	7
Отдел статистики финансов	Руководитель государственного органа, находящегося в ведении Президента	4	5
Отдел статистики сельского хозяйства	Руководитель государственного органа, находящегося в ведении Президента	4	5
Отдел статистики цен	Руководитель государственного органа, находящегося в ведении Президента	4	6

However, the e-Kyzmat system support for administrative HR activities is somewhat limited, as all processes are carried out on paper, and only the conclusive data is subsequently entered into the system. For example, when employees request vacation a paper-based application is filled and submitted to their manager, who after approval sends it to the HR Unit, where one of its staff enters the necessary details such as the date, number, and «on vacation» status, into the system (Figure 18). A similar process is followed for sick leave. While the current approval process for business trips also relies on a traditional paper-based approach, there are plans to transition to an electronic format. However, it has not been decided yet whether it will be part of the e-Kyzmat system or the EDMS.

Figure 18: Employees on vacation/on leave status

Сотрудник	Статус	Дата
Иванов Иван Иванович	в отпуске	11.30
Петров Петр Петрович	в командировке	11.24
Сидоров Сергей Сергеевич	на больничном	11.20
Смирнов Александр Александрович	в командировку	11.19
Соколов Алексей Алексеевич	в командировку	11.19
Толкачев Владимир Владимирович	в командировку	11.14
Федотов Дмитрий Дмитриевич	в командировку	11.14
Харьков Павел Павлович	в командировку	11.11
Цыганов Алексей Алексеевич	в командировку	11.11
Чайков Николай Николаевич	в командировку	11.08
Шаронов Сергей Сергеевич	в командировку	11.08
Щербинин Александр Александрович	в командировку	11.08
Юрьев Владимир Владимирович	в командировку	11.08
Яковлев Алексей Алексеевич	в командировку	11.08

The e-Kyzmat system has also automated human resource management policy activities but only partially. For instance, the “Competitive Selection” (Synak testirlou) module handles the three-stage selection process: (1) review of documents; (2) testing; and (3) interview. The first stage comprises paper-based applications collected by state bodies’ personnel departments, which, in turn, submit electronic requests to the Agency transmitting the data to the “Synak testirlou” module.⁷⁵ The system automatically identifies candidates for the next stage, and results are emailed

⁷⁵ Through this module three tests are administered: knowledge of legislation, subject matter, and logical A compulsory test of the Kyrgyz language is also taken separately. It is conducted by a private organisation that issues a certificate upon a candidate successfully passes the test.

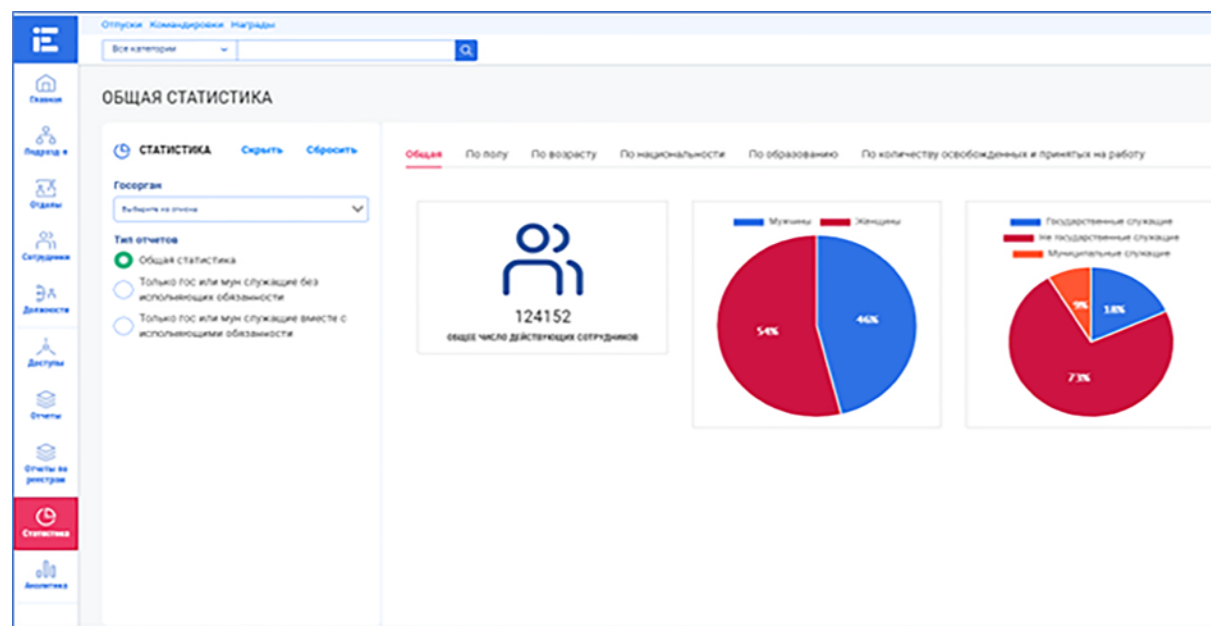
to them, while the relevant Personnel Officers may view the results in the “Competitive Selection” module. The subsequent interview stage is performed manually, with results later entered into the e-system. The ultimate goal is full automation of this activity starting with an electronic application form for candidates to eliminate human intervention and ensure unbiased selection.

Performance appraisal used to also be administered through the e-Kyzmat “Performance Evaluation” module. However, a 2021 Law abolished performance evaluation, replacing it with attestation of public employees. Attestations are conducted biennially by utilising the existing “Competitive Selection” module, due to similarities in procedures, with some modifications. Nevertheless, the “Performance Evaluation” module remains in the e-HMRS – in disabled mode – in case there are further legislative changes that may reactivate performance evaluation.

Another HRM policy activity facilitated by the e-Kyzmat system is training and development supported through the fully operational «Distant Learning» module, which is based on the Moodle platform.⁷⁶ This module, accessible by all civil servants as trainees, underwent an upgrade in 2022 to address previous challenges encountered in on-line learning.

The system provides basic statistical data, i.e., number of public employees, education qualifications, age, gender, ethnicity, etc. (Figure 19). Yet, here is no filtering function currently available to generate only the required information. Another issue with the statistics module involves errors in data and missing data, which can occur due to system changes. For this, statistical data are currently generated through the use of a Google Drive application, where all necessary data are entered manually. When summary statistical reports are requested, the required information is generated separately, and the data has to be downloaded to an Excel or Word file in order to proceed with the necessary analysis manually.

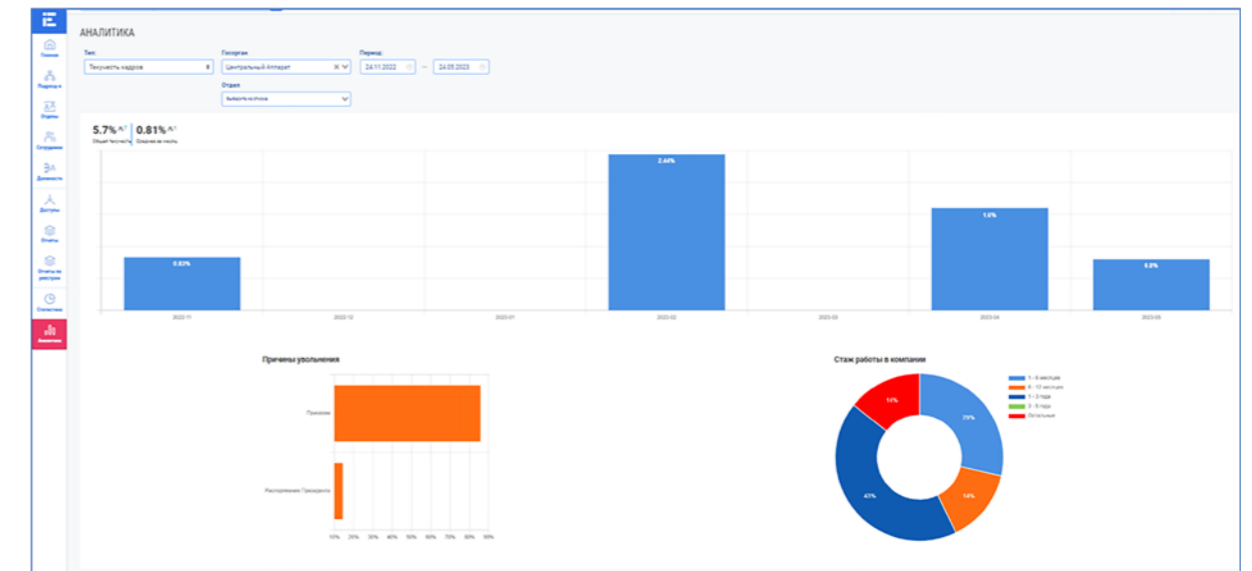
Figure 19: Statistics module of e-Kyzmat



When the “Analytics” module becomes fully operational (Figure 20), then each e-HRMS module will have its own component for analysing data. This module is also expected to be a tool for the country’s leadership, and for the heads of the government agencies to make decisions pertinent to career related issues of employees, i.e., promotions, rotations, re-assignments, layoffs, etc. In its final form, when all modules are completed, this tool will provide information and create summary reports drawing data from across the entire e-HRMS.

⁷⁶ Moodle is a Learning Platform or course management system (CMS) - a free Open-Source software package designed to provide educators, administrators, and learners with a single robust, secure, and integrated system to create personalised learning environments.

Figure 20: Analytics module of e-Kyzmat



Coverage

In 2023, there were 1,218 government organisations connected to the system - state and municipal organisations, and subordinate organisations to the central and municipal government – all coordinated and managed by the Agency. Nowadays, commercial organisations are also connected to the system. In 2023, the number of users was 4,120 approximately; all employees of personnel units.⁷⁷ Other users of the e-Kyzmat are the leadership and management of government organisations, however only for viewing information.

The data of 122,745 public employees – 100% of all state and municipal organisations employees – have already been digitised. The database also includes the data of public sector employees, such as teachers, doctors, etc, although they are not necessarily civil servants, as there is a need for Personnel Units to generate reports. However, the data of Law Enforcement officers are not included, as a separate database is maintained for them.⁷⁸

Integration

The e-HRMS is integrated with several databases of other government agencies (Figure 21), i.e., the Ministry of Internal Affairs database for passport information, residence registration (address), and criminal record (absence/presence) data, the Registry Office for marital status and family composition (children) data, or the Ministry of Education database, so that authenticity of degrees and diplomas may be validated, and the Social Fund database that provides information on a candidate’s work activity.⁷⁹

The e-Kyzmat also has an inverse relationship with other government databases. For instance, it receives information from three databases of the Ministry of Digital Development. Data from the InfoDocs system, data from the “Personnel Management” module (employee personal data, work experience, reports, order), and data from the “Organisational Structure” module (name of state organisation, the departments it consists of, the positions it has, its staffing plan, etc). At the same time,

⁷⁷ Their numbers may vary depending on the number of employees working for a state organisation.

⁷⁸ Some law enforcement officers are represented in the system – the clerk, the head, and personnel departments – as this is necessary for the EDMS workflow process. In other words, law enforcement agencies are connected to e-Kyzmat, for exchanging documents and for signatures, etc as “InfoDocs” does not work without e-Kyzmat.

⁷⁹ Such integration, however, does not exclude the need for paper-based documentation submitted by newcomers to the civil service. The regulations still require notarised copies of the original documents, including a passport, a marriage certificate, and others.

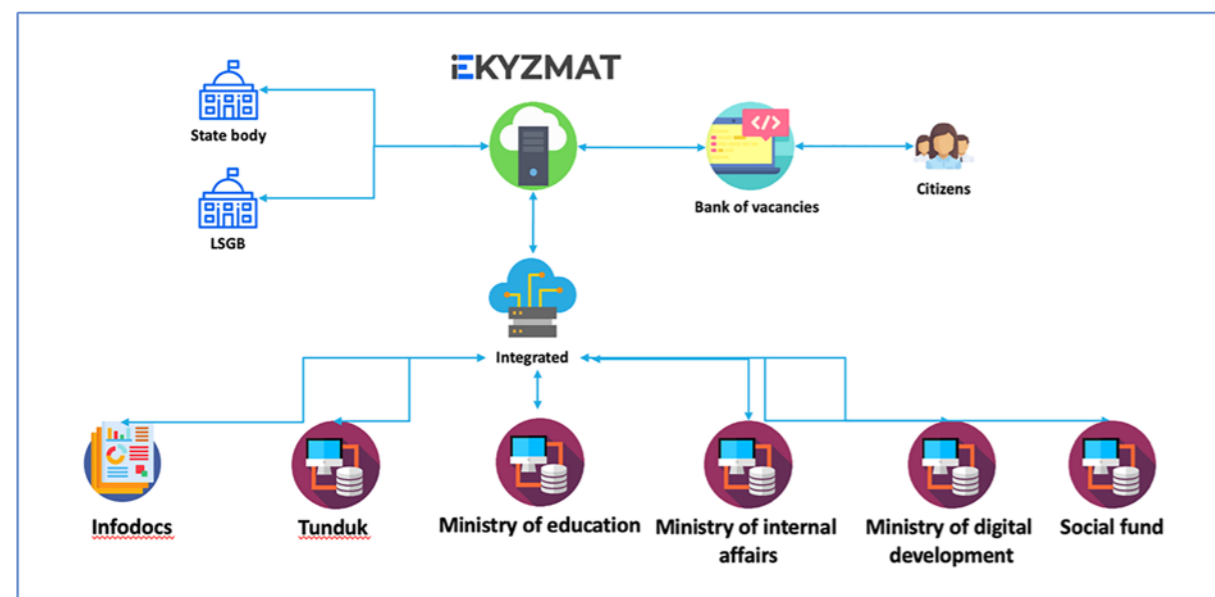
the InfoDocs system also receives updated information from the e-Kyzmat. For instance, if an employee is shown in e-Kyzmat on vacation, or on a business trip, the InfoDocs system does not permit the employee to sign documents. In addition, if an employee is dismissed or appointed, the event is visible to the management of the organisation so that necessary documents may be sent to the relevant employee (for execution).

In accordance with the law, each government agency is the sole owner of its electronic databases.⁸⁰ In the early stages of the e-HRMS development it was proposed that the Agency should be the database holder, but this proposal was not approved by government bodies. As a result, each government body has full jurisdiction of its databases, and it does not allow others to connect, unless there is a signed agreement in effect between government organisations involved. This situation will be a critical issue, if not resolved, for the “Analytics” module, which requires access to data from all government databases to work adequately as a tool for decision making on personnel matters.

For now, there is no integration with payroll systems.

Tunduk is the main gateway network between the different database systems of government organisations.

Figure 21: Interoperability of e-Kyzmat



Training and support

When the system was introduced, some training was provided in the form of presentations. Training was also provided to all public employees during roll out by the Agency. Nowadays, training takes the form of working meetings. Furthermore, if some questions arise users communicate among them by text messages. Requests for service can also be submitted through the Training Departments, and their curators. There are a few curators specialising in various areas and being responsible for specific government organisations.

In terms of system support, a dedicated support team is in place. Infocom’s support team provides training to HR specialists at the Agency headquarters, and subsequently, the Agency conducts training sessions for users, including those in regional departments. Infocom also manages the connection of private organisations to e-Kyzmat, offering them training and support services for a fee.

⁸⁰ <http://cbd.minjust.gov.kg/act/view/ru-ru/21819?cl=ru-ru>

The Agency constantly collects reports on problems and issues from all government agencies, along with suggestions, comments, and requests. Proposals received are implemented, and the system is updated with the changes. It usually takes one week for a request to be processed by the maintenance provider.⁸¹

There is no call centre as such. There is a general call centre in Infocom – 119 – providing reference services that are available throughout the republic to any citizen. Calls to 119 by e-Kyzmat users are re-directed to the Requests Processing Unit (RPU). The RPU also has its own software to communicate with users, the “Introdesk”, through which users can fill in a form with the type of request and for which system - as there are about 80 systems currently in use. No record of changes is kept. However, changes may be tracked by looking at the version control of open-source software features, such as Git.

Data Protection and Privacy

Security and access control are integral to the system. The system’s security includes the creation of separate domains in the e-Kyzmat databases. One for public/municipal employees, another for private traders. A third domain is planned for law enforcement agencies, but there has not been an agreement yet from their side.

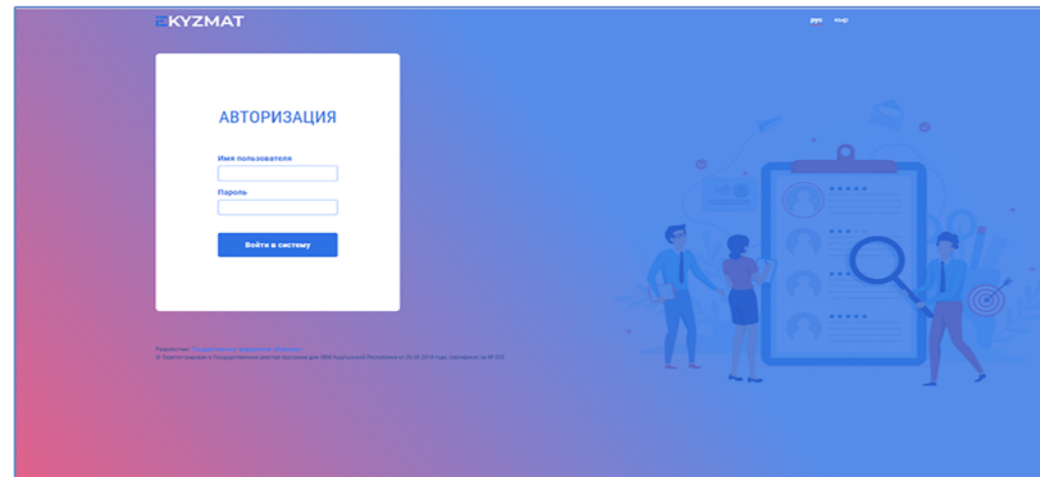
E-Kyzmat is not open to all. It is a closed system. It has its own network using VPN channels for communication, configured with specific certificates.⁸² Overall, access to the system is restricted. The number of individuals who can be users is determined by the management of a government organisation. Usually, if there are five employees in a Personnel Unit, only two may have access. Access to the system is granted to two types of users – HR Managers and Management, namely the Director and the Deputies of an organisation – the latter restricted to a review function only. Heads of Departments do not have access to e-Kyzmat. Central offices enjoy privileged access to viewing all subordinate units’ databases since Kyrgyzstan has adapted a centralised personnel department system in which one division manages personnel for all others. Conversely, subordinate units can only access their own databases.⁸³

The e-Kyzmat system is on-line, and it is accessed through an authorisation window using a username and password (Figure 22). This is the first step in ensuring system security. The second step is the use of closed (encrypted) channels on the Internet. Issuance of authentication credentials for the e-Kyzmat system is the responsibility of “Infocom”, the developer and maintenance operator of the e-HRM system. The single authorisation system – the Unified Authorisation Centre – was developed by “Infocom”. But there are other systems too, such as “InfoDocs”. Authorisation is done according to the Google Principle, when a single authorisation user function allows access to all services. This is a one-factor authentication system. A two-factor system of authorisation is planned.

⁸¹ The delay is usually noted at the legislative level. It takes time to enact the necessary regulations for the changes to come into effect, i.e., preparation of draft regulation and coordination with the legal department.

⁸² Modules that need to communicate externally, i.e., the “Distant Learning” module use the government gateway.

⁸³ In practice, however, it also happens that each division has its own personnel department. In this case, each personnel department will only work within its own division, without any connection to other personnel departments in other divisions. The rationale for this, is protection of personal data.

Figure 22: Authorisation page of e-Kyzmat

Managers and employees of personnel department enter through a cloud-based authentication system (electronic signature). This system is currently being removed due to security considerations. It will become operational again when the two-factor authentication system is rolled out. Until then, all users will enter the system through e-Kyzmat authorisation procedure. The system is developed using STEP technologies⁸⁴ The back-end of the system is developed with PHP programming language, and the database is using MySQL. The front-end is developed using JTS.⁸⁵

Benefits of the system

The unified e-HRMS in place – the e-Kyzmat – is a big breakthrough as all public employees have an electronic record of their personal files, thus making moves or transfers from one government body to another easier. There is no need to re-enter their data in a new personal file.⁸⁶ The e-Kyzmat has also contributed to keeping the number of personnel officers' positions low, as Kyrgyzstan management practices entail a centralised personnel department by one division managing personnel matters for all other divisions. For example, the personnel department of the central office is the personnel department for all other subdivisions of the organisation.

HR specialists perceive e-Kyzmat as convenient and helpful because it is an electronic version of employment record books and public servants' personal files; all in one electronic system. Certain features of the e-HRM system make the job easier. For example, the system can generate a "Reference" (an employee's resume), who is considered for receiving an award. Some personnel department employees claim that their efficiency increased by about 50% in preparing reports; it now takes one day to prepare instead of two. Overall, it is suggested that this system works well mainly in organisations not exceeding 200 employees.

Furthermore, the e-Kyzmat data assisted in some strategic decisions in the re-organisation of government departments with respect to the number of vacancies and corresponding reductions in their numbers. Knowing the number of vacant positions helped in adjusting the number of employees in an organisation during re-organisation, by reducing the number of positions to equal the number of existing positions minus the vacant ones.

With the advent of the system, transparency has been enhanced. For instance, there is no longer the possibility to add more candidates or accept required documentation later than the designated deadline for a competition.

⁸⁴ STEPS stands for «Standard for the Exchange of Product model data; informal.

⁸⁵ JTS Topology Suite is a Java library for creating and manipulating vector geometry.

⁸⁶ Conversely, when employees are transferred, retire, or resign, their data is not kept in their former employers' databases. This practice creates difficulties for HR departments in case former employees request any document or statement related to their prior employment.

Challenges and limitations

The biggest challenge in implementing necessary changes to enhance system functionality is associated with insufficient resources, both financial and human.⁸⁷ For the e-Kyzmat to become fully operational, approximately twice as much financial resources must be spent from what has been spent to date. Furthermore, the funding process exacerbates the issue, as funds are not allocated swiftly, and unutilised balances by the year-end must be returned to the Ministry of Finance. To circumvent this, tasks are labelled as urgent, and an unscheduled task status is achieved through a Presidential Administration instruction. Moreover, as modules are developed separately and their progress is heavily dependent on the availability of funding, there are cases where updates required in the system do not happen fast enough or happen only partially.⁸⁸

Equally, the pace of progress in developing the system is impeded by the shortage of essential human resources, mainly programmers. When no big changes are introduced to the system, the current team of six people is sufficient.⁸⁹ However, during the development process of new modules, there is no sufficient number of individuals to perform and complete the required work. For this reason, many tasks are postponed, and they are not implemented.⁹⁰ Analysts are in short supply too.

Another challenge is the frequent change in the legal framework. For instance, in 2021, there were many organisational changes and restructuring of government departments and agencies. Thus, the e-Kyzmat "Organisational Structure" database had to be updated, otherwise system reports would be generated with incorrect information. The change in the performance assessment method for public employees in 2021 also serves as a notable example. The Law came into effect immediately, and the Agency worked urgently to make functional changes in the "Competitive selection" module, so it can perform the Attestation process. For this, there was no time for piloting; it was tested within the Agency only. As a result, many mistakes were noted during deployment.⁹¹

Furthermore, the e-HRMS operation is significantly impacted by frequent government reorganisations, particularly the «Organisational Structure» module. Personnel departments spend a lot of their working time to make changes in e-Kyzmat, that is to re-assign positions of all employees. This is done manually, and it is rather time-consuming. The process is needed and must be completed in the shortest time possible, as without proper identification of positions in the organisational structure, the electronic document flow stops. "InfoDocs" cannot provide access to authorisations sequence procedures correctly, i.e., assign electronic signatures for documents to different hierarchical levels.

⁸⁷ For the development of the "Human Resources Management" and "Organisational Structure" modules about 4 million Soms were spent (USD 46,000 approximately). For the development of the "Competitive Selection" / "Personnel Reserve", "Distance Learning" and "Performance Evaluation" modules about 6 million Soms were spent (USD 68,000 approximately). For the development of the "personal account" in the e-Kyzmat system and the creation of the "electronic employment record book" (employment history), the budget amount allocated is 5 million Soms (just over USD 56,000 approximately). In total, the budget allocated for the e-HRMS development in Kyrgyzstan to date represents approximately 0.001 per cent of the country's GDP.

⁸⁸ This is another reason why paper-based documentation is still required.

⁸⁹ Three to four software developers, two analysts, and a designer are usually involved. There are no Quality Assurance Engineers thus far.

⁹⁰ This lack of programmers in "Infocom" is not due to salary levels but to the lack of programmers with the knowledge, qualifications and skills needed, e.g., not everyone can work remotely.

⁹¹ As mentioned earlier, the "Performance Assessment" module is still in place, but de-activated. In case there is a reversal in policy.

The large and rapid turnover of personnel department employees / system users is also a burden. Training new users is a process that does not always work fast enough. Due to high workloads, there is limited time for training, resulting in providing training for new users through video recordings, with infrequent in-person sessions. Inadequate training may lead to workflow problems and incorrect system usage.

In addition, in the absence of a digital document repository, the e-HRMS has increased the workload for HR personnel, as current legislation requires maintaining both paper and electronic records. This complexity is heightened in organisations that employ a large number of people. Yet, a Government Plan exists that indicates the need for the creation and transfer to a fully Electronic Database System. The development of a digital document repository – “Archive” – is the task of the Ministry of Digital Development.

By continually changing the functionality of the system, issues also arise that cause operational problems. For instance, recent attempts to modify certain modules resulted in incorrectly displayed reports due to altered or replaced fields. In addition, reorganisations impose ID-addresses change frequently, but there is no automatic update of the change in the reports of the other modules, as each module generates reports independently and it is not integrated with the other e-Kyzmat modules.

The system does not provide summary statistical data on the number of public employees, length of service, education qualifications, age, gender, etc automatically. Statistical data are currently generated through the use of a Google Drive application, as the reporting system of the e-HRM does not generate accurate reports. Hence, the same data is entered twice in order to obtain accurate reports.⁹²

In addition, it seems that integration has not reached a satisfactory level yet. This is evident in cases when an e-Kyzmat registered user applies for participation in a competition through the Personnel Reserve. All his/her data have to be entered manually, as there is no compatible level of interoperability with the Personnel Management module, where such information resides. Another issue is if a person quits a position, there is no record about this person in the system. The person’s records cannot be seen. Hence, the need to maintain a paper-based archive, in parallel.

⁹² HR specialists need to enter data into three separate systems – the e-Kyzmat, InfoDocs, and Google Drive.

Uzbekistan

Brief description

The electronic human resource management system in Uzbekistan, referred as hrm.argos.uz is a relatively recent development, initiated in 2022.⁹³ It is an electronic platform created to simplify the process of personnel management at both the national and local levels by replacing paper documents with an effective and modern digital system for monitoring the work of civil servants. One of the underlying ideas of creating hrm.argos.uz is to make personnel management in government agencies easier and more efficient by automating complex tasks related to human resource management. The system is also expected to serve as a platform for information exchange between different organisations on employee issues.

The implementation process of the e-HRM system involved comprehensive piloting and testing procedures. At the end of 2022, the e-HRMS was initially tested with the Agency for the Development of Public Service under the President of the Republic of Uzbekistan (hereinafter referred to as ARGOS) and Uzinfocom.⁹⁴ It was conducted to identify and address any initial issues. Subsequently, in January 2023 testing was expanded to include all government agencies until August 2023, allowing for the refinement of the system and addressing specific nuances of each agency. In May 2023, Presidential Decree 76 mandated that all state bodies must exclusively adopt the electronic personnel management system.⁹⁵ In September 2023, the Cabinet of Ministers issued a resolution specifying that all information and documentation related to human resource management in central and local executive authorities should be exclusively generated and recorded on the electronic platform «hrm.argos.uz» starting from 1 November 2023; excluding however paramilitary structures and law enforcement agencies.⁹⁶

In 2023, a significant administrative reform initiative resulted in a 30% reduction in the number of civil servants and the consolidation of numerous organisations, departments, and ministries from 61 to 28 independent state bodies. It significantly increased the workload of HR managers who had to navigate through these changes and adapt to the evolving demands of their roles.⁹⁷ In retrospect, in addition to automating the system for improved accuracy and efficiency in maintaining records of civil service personnel and associated processes, the primary objective of the system was to streamline the work of personnel officers. Nevertheless, the system does not only handle routine operational/administrative functions but also it liberates HR managers to focus on more strategic and value-added responsibilities, ultimately contributing to the organisation’s overall effectiveness and long-term success.

Governance and Management

The coordination and management of the e-HRMS fall under the scope of the ARGOS,⁹⁸ as the primary government organisation overseeing the HRM in civil service and reporting directly to

⁹³ The e-HRM system is aligned with the country’s overall HR strategy embracing digital innovation and modernising HR management, emphasising efficiency, transparency, and enhancing employee experience to meet evolving needs. <https://hrm.argos.uz/>. It is based on the Decree of the President of the Republic of Uzbekistan “On the Development Strategy of New Uzbekistan for 2022–2026”. The roots of this digital transformation trace back to the Presidential Decree 6079 of October 2020, which articulated measures to implement the «Digital Uzbekistan 2030» strategy, setting the stage for development until 2030. Subsequent documents draw from this framework, shaping medium and short-term programmes for advancing digital technologies in Uzbekistan; <https://mitc.uz/ru/news/3680>; <https://lex.uz/ru/docs/5031048>

⁹⁴ <https://uzinfocom.uz/uz>

⁹⁵ <https://lex.uz/en/pdfs/6472530>

⁹⁶ Resolution No. 492 (22.09.2023); <https://lex.uz/docs/6615596>

⁹⁷ Moreover, the transformation was also empowered by a shift from a personnel specialist to a Human Resource manager concept.

⁹⁸ <https://www.argos.uz/en/about>

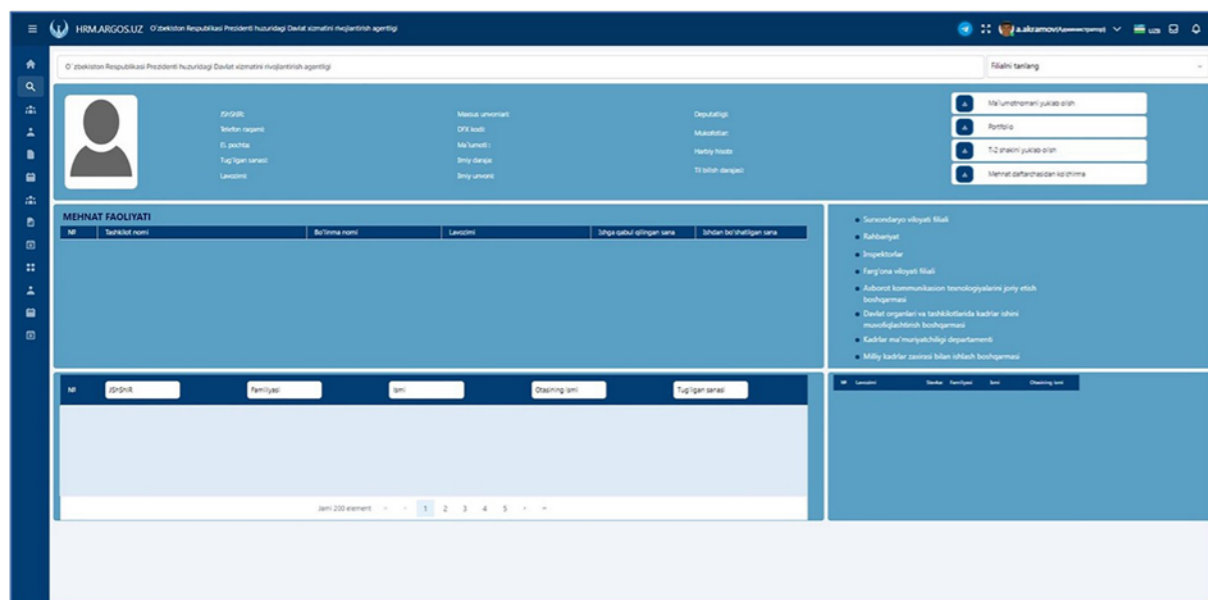
the President of the Republic of Uzbekistan. ARGOS takes a central role in governing the entire development, implementation, and management of the e-HRMS in the country, making it the focal point for digitising HR processes in the civil service. The responsibilities assigned to the ARGOS are multifaceted. They include ensuring the e-HRMS complies with legal requirements, upholds data security, and seamlessly integrates with other government systems; as well as liaising with ministries and other government departments to facilitate the system's smooth operation.

The e-HRMS is developed and maintained by the Unified Integrator of Uzbekistan (Uzinfocom), a subordinate organisation of the Ministry of Digital Technologies. Uzinfocom is a limited liability company with over 20 years of experience in IT development. Its scope of work includes system creation, maintenance, and ensuring legal compliance of the system. Uzinfocom operates under the authority of the Agency, which provides guidance and supervision. The current team of Uzinfocom working with the e-HRMS comprises three developers, four analysts, and one UX designer. Plans are in place to expand its membership as the system progresses and eventually create a department. Maintenance and support for the system are provided by the same Uzinfocom department responsible for the development of the e-HRMS.

Functionality

The e-HRMS is specifically tailored for HR units and management, aiming to streamline various administrative HR functions, including personnel profile management, document management, and time tracking. The employee profile encompasses a comprehensive record for each civil servant, complete with personal details, job appointment, employment history, length of service, training information, performance assessments, sick leaves, business trips, awards, and other relevant data (Figure 23). Some government organisations have reported that at least 50% of the data have been digitised, with the employment record data for most civil servants integrated into the system in 2019, in accordance with relevant legislation.⁹⁹

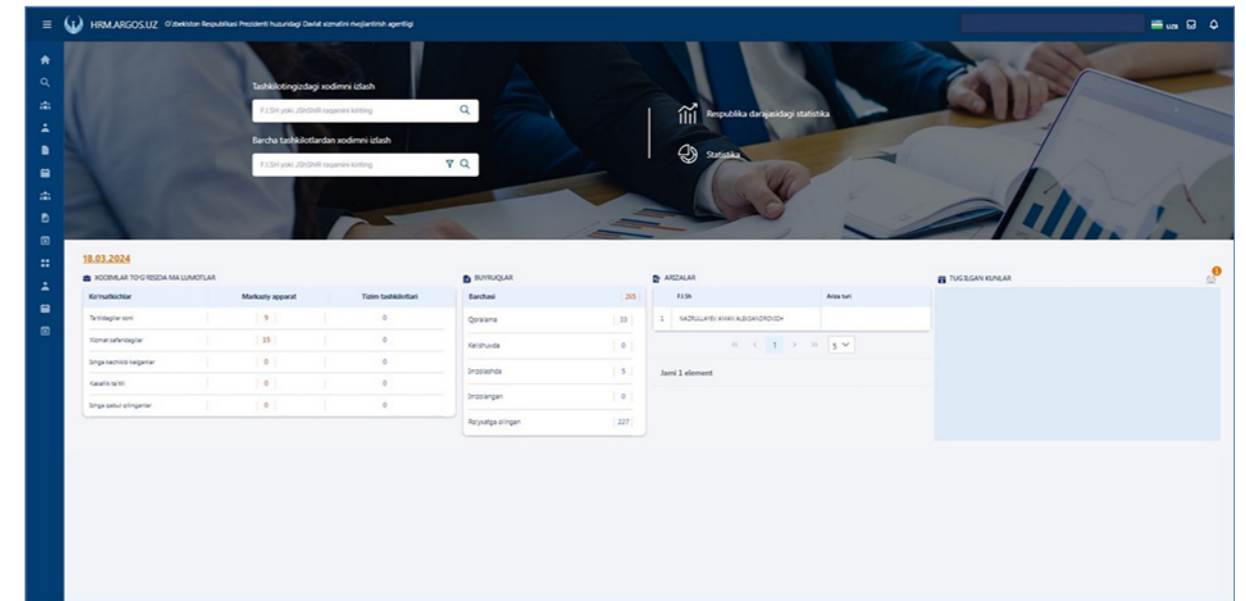
Figure 23: Employee profile in HRM.argos.uz



⁹⁹ According to the Decree of the President No. ПП-4502 dated October 31, 2019, new labour contracts must be registered in Unified National Labour System (UNLS) from 1 January 2020, and the existing ones must be changed or terminated by 1 September 2020. At first, the UNLS did not cover the private sector. It provides employers and employees with a platform for registering labour relations in electronic format and serves as an electronic database of individuals' employment record, effectively replacing the old system of "employment record books." Also, the UNLS contains actual, real-time information of the labour market and employment, the balance of labour resources, vacancies, and quantitative and qualitative composition of employees.

Individuals who still possess paper versions of employment record books,¹⁰⁰ primarily those transitioning from the private sector to the civil service, have the option to input their employment history data through the my.argos.uz platform. They can personally enter the required information, and HR specialists from their last previous employer must verify the accuracy of the data entered into the system.¹⁰¹ The system also contains details on the organisational structure, staffing, and up-to-date information on the number of employees who are on a business trip or on leave (Figure 24).

Figure 24: Main page of HRM.argos.uz



Furthermore, an attendance tracking function is enabled mainly through integration with the Access Control and Management System (ACMS) which tracks the time when employees enter their office (through the turnstile or via Face ID). Moreover, integration with the Ministry of Health's system enables the system to promptly register sick leave on the very first day, which is then recorded in the timesheet. Importantly, the system also has the capability to monitor working time of employees engaged remotely. This was made possible by recent changes in the Labour Code.¹⁰² Despite these electronically streamlined processes, the timesheet form is still manually completed and submitted to the accounting departments which operate their own separate UzASBO system.¹⁰³ However, technical work is on-going to integrate HRM.argos.uz with the payroll system of the Ministry of Finance.

HRM.argos.uz facilitates the management of personnel-related documents, although only partially, allowing HR officers to create different orders for actions such as dismissals, vacations, and business trips in the system, but the statement from an employee or a memo from a head of department – the

¹⁰⁰ While still legally valid, traditional employment record books coexist with electronic employment records that also carry legal weight. Any discrepancies are addressed on a case-by-case basis.

¹⁰¹ It is in the employees' best interest to be included in the database to ensure that details such as length of service and vacation days are accurately reflected. Keeping up with this trend proves beneficial for civil servants as it simplifies various processes, including career development and retirement. For example, personnel officers no longer require hard copies of training certificates; civil servants can directly upload them through my.argos.uz.

¹⁰² When an employee activates their laptop/computer, the integrated Unified Interdepartmental Electronic System for Performance Discipline "ijro.gov.uz" tracks the start and end times, automatically transmitting this information to the e-HMRS. <https://mf.ijro.uz/#!/welcome>

¹⁰³ It is the electronic compensation system for civil servants developed by the Ministry of Finance of the Republic of Uzbekistan; <http://main.uzasbo.uz/>

to all subdivisions, and subsequently to each employee, following a top-down structure. Regular reports on performance delivery are then submitted by individual civil servants to HR units, either on paper or via email. These reports are evaluated, and bonus payments are determined, as the performance assessment is directly linked to the pay system.

Coverage

The HRM.argos.uz system is being implemented consistently across all government organisations and departments that fall under the purview of legislation pertaining to public civil service. While in a testing mode, the platform has achieved significant connectivity, with all ministries and departments, along with over 4,000 organisations that are part of their system, being successfully connected. This constitutes around 95% of the government apparatus. Such extensive coverage ensures that HR processes are digitally streamlined not only at the central governmental level but also at the local administrations level, contributing to the overall efficiency and uniformity of HR practices throughout the country. However, the Presidential Administration and the law enforcement agencies are not part of the system. Nevertheless, the Cabinet of Ministers is in the process of implementing the system, with information entry underway (September 2023).

The system's scope extends beyond the central and local government levels, as there are plans for further expansion. The government envisions extending the system to encompass all state organisations, even those not directly under the civil service, such as educational institutions and hospitals. This expansion reflects a forward-looking approach aimed at digitising HR management across a wide spectrum of public sector entities. Such plans are indicative of the government's commitment to the widespread adoption of digital HR practices.

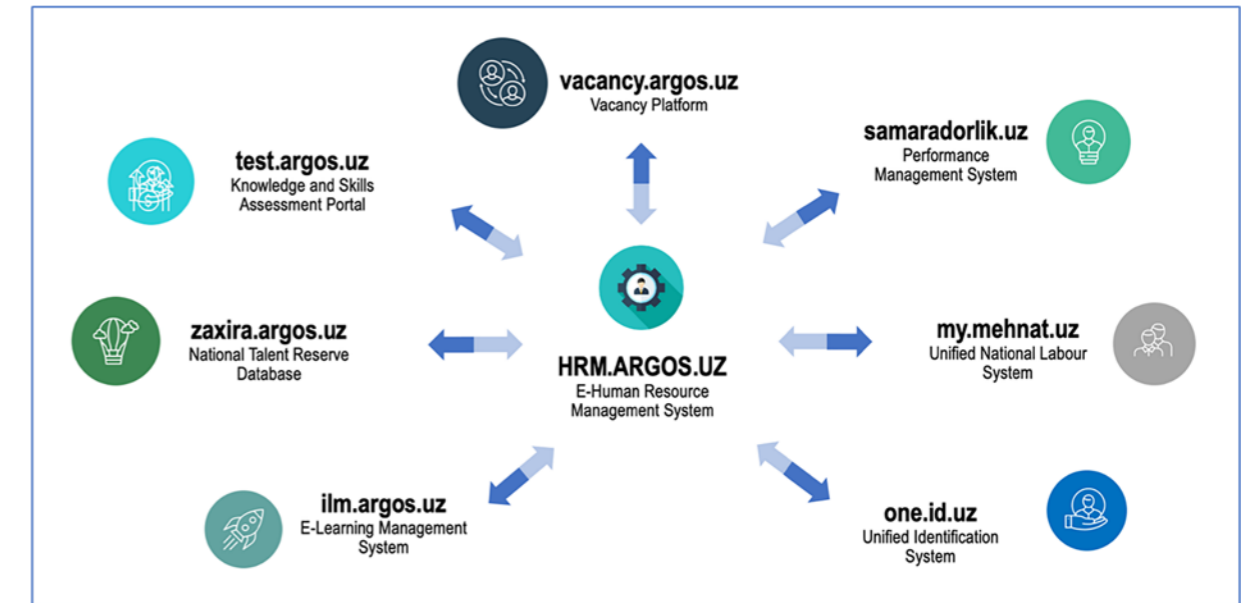
Integration

HRM.argos.uz is being integrated with various other HR systems and databases. To date, approximately 15 systems have been integrated with varying degrees of data sharing (Figure 26). The e-HRMS exchange necessary information with some of them, while for others it serves as a data source, or vice versa. For instance, the platform automatically shares the structure of government agency, employment contracts, additional agreements, and information on vacant positions with the Unified National Labour System (UNLS) "my.mehnat.uz". In return, HRM.argos.uz retrieves employment records from the UNLS, although for newcomers from the private sector, some information may be missing.

The platform is currently undergoing full integration with the Unified Open Portal of Vacant Positions for civil servants, known as «vacancy.argos.uz»¹⁰⁹ This integration aims to establish a comprehensive chain, ensuring that candidates cannot be accepted for a job without successfully passing the competitive selection process. Presently, upon hiring, the e-HRMS retrieves three parameters – personal identification number, date of birth, and passport number – from vacancy.argos.uz. Subsequently, the system obtains the remaining required data for newly hired individuals from other data sources through the «State Personalisation Center» system, which maintains information about all citizens of Uzbekistan. For example, the e-HRMS receives sick leave certificates from the Ministry of Health, information about higher education from the Ministry of Higher and Secondary Special Education, and details about family composition from the Civil Registry Office.

¹⁰⁹ www.vacancy.argos.uz is an on-line platform for open competitive selection, fully automated and integrated with the Ministry of Employment and Labour Relations' Unified National Labour System. Serving both employers and candidates, it operates on a one-window principle, reflecting all civil service vacancies. The system offers convenience by displaying all candidate information through a single account created using a personal identification number. Integrated with E-Government databases, candidates can apply for vacancies using their personal account. The selection process includes three stages: qualification compliance check, testing, and interview - all results are accessible by the candidates. The automated interview stage allows competition committee members to evaluate candidates promptly, reducing hiring time from 2-3 months to 20-25 days.

Figure 26: Integration of HRM.argos.uz



Meanwhile, from the moment an application is submitted to the point of hiring, prospective employees' personal data may undergo changes, and in such instances, access to up-to-date information is crucial. Currently, information is not automatically updated in the e-HRMS, however efforts are being made to transition from a request-response approach to a push notification system. For instance, if there are changes in the data of a particular individual in the State Personalisation Center, notifications will be dispatched automatically to all organisations where this individual is registered with, prompting the necessary modifications. In cases where an individual transitions from one government agency to another, an update request is initiated.

Currently, efforts are being made to integrate HRM.argos.uz with the Unified System of Interdepartmental Electronic Document Management "edo.ijro.uz," to ensure that documents generated in the e-HRMS transition to edo.ijro.uz. As per legislation, the HRM units maintain their own records of personnel related documents, including numbering, while organisation-related documents are concurrently stored in a separate folder within the edo.ijro.uz system. Therefore, individuals responsible for the documentation system in edo.ijro.uz must have access into the HR orders; integration to achieve this is presently underway.

In general, the process of integration with other state organisations typically involves two steps: (i) Signing a General Agreement: at the initial stage, an agreement is signed to outline the terms and conditions of the integration; and (ii) Signing a Tripartite Technical Instruction: a tripartite technical instruction is signed by ARGOS, Uzinfocom, and the data provider organisation. This instruction serves as a detailed technical framework for the integration process.¹¹⁰

Overall, the integration of the e-HRMS with other government systems shapes the development of Business Process Reengineering (BPR), which is, in turn, influenced by three factors: (1) the evolution of legislation, (2) internal changes implemented in systems of other government agencies, and (3) the digitalisation process revealing unnecessary steps. For instance, previously, employees had to manually provide information about their family and close relatives. However, through integration with the single portal for interactive public services,¹¹¹ this process has been streamlined, eliminating the need for separate requests. The required information is now automatically filled and stored in the personal files of employees. In essence, the BPR has led to the development of a more efficient HRM system.

¹¹⁰ It is worth noting that if the integration occurs through an interdepartmental traditional platform developed within UZINFOCOM, only a general agreement is required. In such cases, standardised requests streamline the integration process, eliminating the need for additional technological instructions.

¹¹¹ <https://my.gov.uz/ru>

User participation and involvement

Prior to commencing the development of the system, ARGOS conducted consultations with HR specialists and government agency heads to identify essential functions to be included in the e-HRM system, as well as to consider other features suggested by the various stakeholders. This inclusive process involved convening focus groups with representatives from seven ministries. In addition, Telegram chats were activated to collect and rationalise ideas and suggestions from all potential stakeholders. Through these collaborative efforts, HR specialists actively contributed valuable insights, for further shaping the desired functionalities to be included in the e-HRMS. Such proactive engagement by stakeholders demonstrates a commitment to meeting the needs and preferences of system users.

Training and support

After the development of a test version of the system was completed, in-person training sessions were organised for HR managers at central offices, subsequently extending to the regional level and beyond. In addition, consultations were arranged via telephone and Zoom meetings to address users' questions, while they were familiarising themselves with the new system. Nowadays, guidelines, handbooks, and eight short tutorial videos are provided for the introduction of newcomers to the system and for supporting existing users. Plans are in place for creating training videos to be uploaded directly to the system; when on-going changes in legislation have been completed, and training videos are up to date with the legislative and regulatory framework.

In May 2023, a dedicated troubleshooting group was formed - a test-mode call centre - to receive feedback and collect suggestions collection, as well as to provide continuous support. Call centre specialists received training to respond through various communication channels provided by UZINFOCOM and ARGOS (primarily its Digitalisation Department). Overall, users are supported 24/7 through multiple communication means, including a call centre, email, Telegram channel, and chatbots. Requests for support are categorised into three types: (i) critical; (ii) non-critical; and (iii) others.

For now, ARGOS and UZINFOCOM operate as a unified working group, with two responsible individuals from ARGOS overseeing the project. Requests for system improvement may originate from both ARGOS and UZINFOCOM. The working group holds discussions for prioritising requests and identifying solutions. Requests are individually assessed. The time required to execute a request can vary; some tasks may be completed within 2 hours, while others may take up to 2 days. To maintain transparency, all changes are tracked using Trello,¹¹² a cloud-based project management tool. Code versioning is also used, i.e., developers document changes within the code, including when the changes were made and their nature.

Data protection and privacy

The e-HRMS employs robust measures to ensure data protection and privacy across various aspects of its operation in accordance with the legal foundation established by the Law on Personal data (passed in June 2019). The system operates within an open network throughout the territory of the Republic and restrictions are in place for preventing external access from other countries. Users, particularly those from HR departments, undergo a strict authentication process to gain access to the system. This involves submitting a corresponding letter and a public key of the Electronic Digital Signature (EDS) to ARGOS, which is then attached to the organisation for access. Access is exclusively permitted through the assigned EDS, and any transfer of this right is legally prohibited, ensuring the system's security.

For information security purposes, users enter the system through a gateway, and access is granted only if authorised. Access privileges are role-based. Theoretically, HR specialists can initiate access from home using their EDS, which can be downloaded to any computer. Heads of organisations appoint responsible individuals, and the EDS access code is sent via SMS. Regular confirmation is required to maintain access. This is achieved by forcing access codes to expire every six hours.

¹¹² <https://trello.com/en>

In addition, the system does not allow full data transfers to mitigate the risk of a significant data leak if the Application Programming Interface (API) is compromised. Limited data is received from vacancy. argos, that is, passport number, date of birth, and personal identification number. Then, the system sends requests independently to various other systems to obtain other required data. Data visibility is strictly controlled, with each organisation having access only to data relevant to its own operations. Ministries, as central authorities, have visibility into their subordinate organisations data but lack the capability to make changes. Horizontally, ARGOS has visibility across all organisations; but it cannot modify any data.

HRM.argos.uz prioritises data backup and redundancy, with a daily backup occurring at midnight and additional backups throughout the day, copied to different servers. Developers contribute to data redundancy by regularly copying codes to the corporate GitHub.¹¹³ Currently, all servers are located in the same physical space, but the Ministry of Digital Technologies is actively working towards establishing geo-distribution. Operating within a cluster featuring numerous virtual servers storing system data, there are separate backups and combat servers. Plans are underway to geo-reserve the entire cluster in another data center, enhancing overall system resilience and disaster recovery capabilities.

Benefits of the system

Policymakers, developers, and the maintenance provider view HRM.argos.uz as a transformative tool that aligns with the broader goal of digitalisation and administrative reform. They perceive it as a means to modernise HR management in Uzbekistan's civil service. The system reflects a commitment to open governance, equal opportunity, and transparency, making it a key tool in the government's framework for HRM policy.

The e-HRM system was designed with a microservices architecture, allowing for ease in making changes and accommodating evolving requirements. Presently, the focus is on the transformation of the front-end segment into a modular structure. This will enable organisations to tailor their main page to their specific needs by selecting the relevant functions from the available modules. For example, one organisation may choose to highlight the attendance function on its main page, while another may give precedence to displaying order-related statistics.

The e-HRM system has had a notable impact on HR management in the civil service, with a remarkable 80% reduction in staff turnover reported by HR managers. This reduction signifies the system's role in streamlining and optimising HR processes, notably diminishing administrative burdens. Key automation of recruitment and interview processes has significantly expedited candidate hiring, reducing the time frame from 2-3 months to 2-3 weeks. This enhancement not only bolsters efficiency but also augments the quality of HR decision-making by offering data-driven insights.

Furthermore, this impact is reflected in the transformation of HR specialists' roles within district divisions. They have been redesignated as Human Resource Development Specialists. Future plans within one of the ministries are geared toward prioritising staff training and development, leading to the potential consolidation of administrative tasks from six personnel to just two, thanks to system improvements. This realignment enables remaining personnel to focus on developmental and strategic aspects. ARGOS has even recommended renaming the Personnel Departments to Human Resources Management Departments. This shift has led to a change in perception as well.

While it is premature to quantify significant cost reductions due to the system's recent implementation, there are already notable benefits. The partial elimination of paper documentation has resulted in substantial savings, cutting expenses associated with physical storage and manual processing. The reduction in HR process time has a cascading effect, reducing the resources required and leading to cost savings.

Evidently, the e-HRMS offers substantial benefits for HR professionals, facilitating the management of personnel records and streamlining HR operations, and reducing the reliance on traditional paper-

¹¹³ GitHub is a developer platform that allows developers to create, store, manage and share their code. It uses the Git software, providing the distributed version control of Git plus access control, bug tracking, software feature requests, task management, continuous integration, and wikis for every project. <https://github.com>

based documentation. The work of HR managers is greatly facilitated by the system, as monthly and quarterly reports must be submitted to various departments and ministries, agencies. Such reports can be generated through the system. Various statistics can be extracted from the system, using such data as the number of employees aged 30, the number of women, or the number of people of retirement age. Such analytics are useful to HR managers, in planning the number of open positions [vacancies], personnel changes, etc.

The e-HRMS has had a noticeable impact on corporate culture, particularly in terms of fostering transparency. It allows for decisions to be more transparent, e.g., which employees will participate in advanced training or go on overseas trips. This feature has been well-received, especially as it helps overcome obstacles some employees might face in terms of promotions or trainings.¹¹⁴ Additionally, it has positively influenced work-life balance, as the system tracks vacation scheduling diligently and displays when an employee must go on vacation.¹¹⁵

The positive perception of the HR departments has also improved, largely due to their elevated status in a government organisation. As one of the HR managers aptly expressed it, «If they used to be feared of us (of HR managers), now we are respected.» Furthermore, employees are also taking a more proactive approach, for example, by uploading training completion certificates to their system profiles. This reflects a culture of continuous learning and development.

Challenges and limitations

Policymakers, developers, and the maintenance company acknowledge that the implementation of the e-HRMS was not without its challenges. One of the significant challenges faced were objections from some ministries and departments that already had in-house systems. This necessitated reaching a delicate balance between the e-HRMS integration and maintaining the autonomy of existing systems.

Another challenge was the existence of different technological approaches and disparate systems adopted by different ministries and departments and the decentralisation of information systems, identified in 2017. Some systems were even imported from foreign countries, and they lacked the necessary provisions for modernisation and integration with each other. This fragmentation posed a considerable hindrance to data consolidation and efficient operations.

The introduction of the Single Identifier of Citizens of Uzbekistan, a 14-digit Personal Identification Number (PIN) was a pivotal turning point. This technique enabled the formation of databases and systems utilising these unique identifiers, offering a conducive environment for database integration. At this time, numerous government agencies are still working on the PIN implementation, which requires major changes in their own in-house systems, and thus complicating the integration process further.¹¹⁶

Prevalent business processes in the civil service further complicate the integration challenge. The process of appointing civil servants involves multiple stages, including selection, approval for appointment, and dismissal, often requiring more than one signature for validation. Additionally, the ARGOS system, as an example, mandates comprehensive procedures for hiring, such as testing, interviewing, and announcing vacancies. These processes, though essential for legal compliance, contribute to the complexity of the overall business process.

Handling historical data, particularly the archiving and accessibility of diplomas dating back to the Soviet era, has also presented a unique and intricate challenge. The process of consolidating data from diverse government agencies and databases, especially those established before the year 2000, has been time-consuming and intricate. While the unified system promises substantial benefits, its effectiveness hinges on the complete integration of all government bodies, a task that remains on-going.

¹¹⁴ In compliance with the Civil Service Law, the system ensures that advanced training is an annual requirement.

¹¹⁵ This is based on an interesting point made by one of the interviewed heads of HR unit.

¹¹⁶ For instance, a need exists for the system to generate Help-objective documents and portfolios for employees or job candidates automatically. However, the collection of requisite data is impeded by the lack of precise identifier-based connections to other databases and the system.

DISCUSSION

Four different countries, four different electronic human resource management systems (e-HRMS). Each was designed and developed utilising local experience and expertise, and taking a different approach in the way the system was designed, developed, and deployed; most likely reflecting the different administrative cultures prevailing across the countries included in this study. In fact, utilising discourse analysis on the respective e-HRMS brand names, some interesting differences in their orientation are revealed. For instance, the Korean e-HRMS brand name “e-Saram” means “person” in Korean. Evidently, e-Saram focuses primarily on the general user, the individual. Conversely, the Kazakhstani “e-Qyzmet” and the Kyrgyz “e-Kyzmat” denote “service” and they focus primarily on the organisation as a whole, and not on the user.

This perspective can be attributed to the relatively later development of the e-HRMS in Kazakhstan, compared to the Republic of Korea. Meanwhile, in Kyrgyzstan and Uzbekistan, these systems have been primarily designed for use by HR personnel and organisation leadership, with the former serving as main users, underscoring their focus on enhancing organisational HR processes.¹¹⁷

The timing of the development and deployment of the e-HRMS also differs considerably across the four countries. The first version of the Korean system became operational in 2001. Subsequently, it was redesigned and redeployed in 2011 utilising a drastically different design rationale and different technology. In 2020, payroll services were also incorporated into the e-Saram. The Kazakhstani system became operational in 2016 with nine modules and 22 subsystems, and it has been in a state of flux since, undergoing constant improvements by considering changing personnel management needs and technological advancements.

In Kyrgyzstan, the initial version of the e-HRMS became operational in 2017 with two modules. Then, in 2018 the second and current version was released to which central government organisations and local government were connected in 2019 and 2020 respectively. In Uzbekistan, development of the e-HRMS began in 2022, and by early 2023, the system was deployed in a pilot operation phase. By the end of 2023, all central and local government organisations were required to use the e-HRMS as the primary medium in personnel management processes, except for those in paramilitary structures and law enforcement agencies. This exception also applies in the cases of Kazakhstan, and Kyrgyzstan, whereas in Korea only military personnel are not included in e-Saram.

All four e-HRMS are coordinated and managed by a government organisation. The Ministry of Personnel Management is responsible for e-Saram that encompasses central government employees only – as other e-HRMS exist for local government and education personnel and managed by other ministries. The development and maintenance of the system are entrusted to private sector companies selected through an equitable and transparent competitive process. The key rationale for outsourcing development and maintenance work is that government officials often lack the necessary specialised skills and competencies required for such tasks. In Kazakhstan, the e-HRMS is coordinated and managed by the Agency for Civil Service Affairs, an organisation directly responsible to the president is in charge of overseeing and ensuring the efficient and effective management of e-Qyzmet in a unified manner across the country. The development of the e-HRMS is outsourced to the private sector through public procurement processes, annually. The rationale for outsourcing is very similar to that of Korea. It lies in the comparatively wider

¹¹⁷ This perspective is illustrated in the case of the Kyrgyz e-HRMS whose complete title is “e-Kyzmat Automated Information System”. This title denotes the primary function of the system, that is focusing on maintaining and updating personnel data rather than actively managing personnel. It is also illustrated in the case of Kazakhstan. According to the e-Qyzmet statement of purpose: “*The very concept of e-Qyzmet in recent years has been moving towards minimising the work of personnel management services as much as possible. All data that are available from several sources and any information system that can fill a personal file, they are pulled up as automatically as possible.*”

human and technical capabilities, flexibility, and capacity to swiftly implement changes of private companies. However, the maintenance of the system in Kazakhstan is entrusted to a quasi-public organisation operating under the Agency's jurisdiction. In Kyrgyzstan, the State Agency for Civil Service and Local Self-Government Affairs is the owner and manager of e-Kyzmat setting the e-HRMS objectives and coordinating the work performed by the developer company. In this case, the developer and maintainer of the system is a state-owned company – a subsidiary of the Ministry of Digital Development. Conversely, in Uzbekistan the coordination and management of the e-HRMS falls under the Agency for the Development of Public Service (ARGOS), an agency directly under the president of the republic. The e-HRMS is also developed and maintained by a state-owned company – as in the case of Kyrgyzstan – which is also a subsidiary of the Ministry of Digital Technologies.

As far as the functionality of the e-HRMS is concerned, the e-Saram seems to encompass a multitude of administrative and policy related activities and a fully functional statistical module generating statistics on demand for administrative purposes and policy related decision making. However, e-Saram does not handle recruitment, as this task is undertaken by the Ministry of Personnel Management through comprehensive national examinations. The most recent version of e-Saram is also flexible and scalable to accommodate changing needs and future growth. The system provides tailored services to various user categories ensuring that different categories of civil servants receive services optimised for their respective roles and responsibilities. Conversely, In Kazakhstan, e-Qyzmet has automated a range of administrative HR activities, including recruitment and selection processes. E-Qyzmet is also capable of generating HR related statistics – albeit a limited range - and it cannot yet provide graphical data analytics. In Kyrgyzstan, the e-Kyzmat functions primarily as a unified database of civil servants comprising two operational blocks, the personnel management and organisation structure modules. Nevertheless, e-Kyzmat provides limited support to administrative HR activities, as HR processes are carried out on paper and only the final data is subsequently entered into the system. This is also the case for HR policy related activities, as e-Kyzmat handles them partially. Furthermore, e-Kyzmat does not provide statistical data at the moment. Statistics are generated by downloading data stored into a Google drive application to an excel file for further manipulation and analysis and for report generation. Lastly, in Uzbekistan, the e-HRMS encompasses a range of key HR administrative functions.

It seems that coverage varies widely from country to country. it ranges from almost full inclusion of personnel that is classified as civil service to select groups of civil servants, i.e., central government administration only. For instance, in Korea e-Saram covers approximately 400,000 public servants, irrespective of their rank, across 70 central administrative government departments and agencies (November 2023). The e-Saram does not cover local government employees nor education personnel, who are managed through separate systems. The system is also used by approximately 6,000 HR and 1,000 financial managers. In Kazakhstan, e-Qyzmet covers the majority of government entities at all levels including central government organisations, various committees, and local government executive bodies. The system accommodates approximately 65,000 civil servants, each with a distinct access level. Plans are under way for other government entities, irrespective of their status, to join e-Qyzmet, including the Executive Office of the President and the Prime Minister's Office, although some political and administrative civil servants as well as law enforcement personnel will not join, apparently due to privacy and confidentiality concerns. Apparently, plans are in place to develop separate e-HRMS for such personnel. The Kyrgyz e-HRMS encompasses 100% of all state and municipal organisations employees – approximately 122,745 individuals from 1,218 different government organisations. The e-Kyzmat database also includes data of other public sector employees, such as teachers, doctors, etc but it excludes law enforcement agencies personnel, who are managed through a separate database. In Uzbekistan, the e-HRMS has a comprehensive coverage both at the central and local levels of civil service, excluding however personnel of the presidential administration and of the law enforcement agencies. 61 ministries and state organisations, along with 208 regional administrations are connected to the system. This extensive coverage ensures that all HR processes are digitally streamlined across the civil service contributing to the overall efficiency and uniformity of HR

practices throughout the country. In fact, the government envisions to eventually incorporate all state organisations, whose personnel is not classified as civil service. However, the presidential administration and the law enforcement agencies personnel are not part of the e-HRMS.

Integration of electronics systems and databases of different government organisations is considered a positive step towards streamlining HR processes and thus contributing to more efficient flow of essential data and pertinent information across institutions. It is not an easy task to accomplish as considerable complexity is involved given the different systems that need to be integrated with each other. Nevertheless, it is a necessary step to enhance the efficiency and coordination in the operation of diverse systems under a common platform. In Korea, the deployment of the second-generation e-Saram allowed for the integration of 70 distinct institutions that maintained separate systems. In total, 180 distinct systems were seamlessly integrated into the system, establishing e-Saram as a comprehensive repository and authoritative source of information for various HR administrative functions. In Kazakhstan, the level of integration of the e-HRMS is quite extensive, designed to maximise efficiency through automation of personnel management processes. The e-Qyzmet is connected to over 100 information systems and databases residing in various state entities, thus enabled to retrieve information for managing, updating, and maintaining public personnel records. In Kyrgyzstan, the e-Kyzmat is also integrated with several databases of other government agencies, such as the ministries of Internal Affairs and Education respectively to retrieve pertinent information for public employees. It is also integrated with the electronic document management system – InfoDocs – in accomplishing several HRM related tasks. In Uzbekistan, the e-HRMS is integrated with some other systems such as time tracking, vacancies, and electronic document management. The process of integration with fifteen other HR systems is currently under way. However, the e-HRMS are not integrated with payroll management systems, except in the case of Korea that integrated payroll management with e-Saram in 2020. That said, in Kyrgyzstan, some initial steps have been taken, albeit still in the development phase. In this regard, drawing from the Korean experience could prove invaluable, given that the e-Saram system has effectively incorporated payroll functionalities despite encountering initial resistance from various government agencies hesitant to embrace such integration.

Proactive user participation and involvement in the development and enhancement of the respective e-HRMS emphasises the importance of user feedback in shaping a system's design, operational capacity, and functionality. It also clearly demonstrates a commitment to meeting the needs and preferences of its potential users. In Korea, the Ministry of Personnel Management conducted a series of interviews involving HR managers and a comprehensive survey among all e-HRMS users to inform the development the second-generation e-Saram. It also involved HR divisions during the development phase. This holistic approach aimed at fostering a conducive environment for a seamless implementation and integration of the new version of the e-HRMS. In Kazakhstan, HR Unit heads and specialists feedback and proposals are considered by the Agency for Civil Service Affairs; thus, participating in the system development process indirectly. Similarly, in Kyrgyzstan, the feedback, and suggestions from the primary users are collected and addressed following the implementation of a newly introduced function. In Uzbekistan, focus groups consisting of HR managers and heads from various ministries, representatives of civil service agencies, and developers were formed on social media platforms, e.g., Telegram for sharing ideas and suggestions for improving the system.

For proper implementation of the e-HRMS users need to be trained initially, as well as when changes and improvements in the system are introduced, in order to ensure that processes are correctly executed, and data are handled accurately and in a secure manner. Hence, in Korea, all new public employees undergo comprehensive orientation training of e-Saram that lasts three to four weeks. Such training is complemented by instructional videos on how the system works, and booklets containing supplementary information. In addition, the Ministry of Personnel Management holds two-day training sessions on e-Saram twice yearly for HR related personnel. In Kazakhstan, training is mandatory for all HR Units employees with each new functionality introduced to the system. In addition, user and/or administrator guidelines

are issued and disseminated. Furthermore, since e-Qyzmet is currently undergoing extensive reconstruction, multiple in-person sessions are organised to demonstrate the new system features and processes. In Kyrgyzstan, when e-Kyzmat was introduced, some training was provided in the form of presentations. Training was also provided to all public employees during rollout. Users can also resolve issues they are concerned with through a messaging system in place for them. As private entities are also users of the system, they may receive training for a service fee. In Uzbekistan, when the test version of the e-HRMS was rolled out, training was provided, first in person and then on-line, to HR managers from central and regional government organisations. Eight instructional videos are also available designed to introduce newcomers to the system, which will eventually be further enhanced when the system is fully operational.

Conversely, users of the e-HRMS require support for properly and correctly operating the system. In all four cases, support is provided usually through the entity responsible for the maintenance of the e-HRMS. For instance, in Korea support is provided through a call centre, and a website for submitting queries typically resolved within a work day. The website also includes a searchable FAQ section for users to retrieve relevant information. In Kazakhstan, a call centre is fully operational providing users with clarifications on issues they are concerned with. There is also an option to address system-related issues via email. In Kyrgyzstan, there is no specialised call centre. However, calls through a citizen support call centre are redirected to a specialised unit that handles the resolution of issues that e-HRMS users are concerned with. In Uzbekistan, a dedicated troubleshooting group has been established to provide support and feedback to users through a multitude of communication channels, e.g., call centres, social media platforms, chatbots, emails and zoom calls.

Special attention is paid to data protection and privacy across all four countries. However, a notable contrast exists in the perception and subsequent implementation of data privacy and personal data protection principles among the four countries. This divergence became evident through a compelling case shared by an HR department head in one of the three Central Asia countries. This HR department head took pride in describing a case where he arranged welfare assistance for an employee based on personal information indiscriminately obtained through the Ministry of Health database, which is integrated with the e-HRMS:

“In the system, you can even see the diagnosis of an employee who is on sick leave. For example, I noticed that one of my employees had a diagnosis that required financial aid from the management, that is, this can also be tracked.”

In another Central Asia country, another HR department head held the view that the integration of the e-HRMS with the Ministry of Health database is crucial for accessing employees’ medical records during sick leave, as such integration would greatly enhance operational efficiency, enabling HR units to proactively access information for timesheet management, rather than waiting until an employee presents a medical certificate, albeit without placing significant emphasis on the privacy of personal information:

“I would also like to have integration with medical institutions. Currently, employees bring medical certificates after their sick leave, as these certificates are issued retrospectively, at the end of the sick leave period”.

These cases illustrate the varying perspectives on data privacy and the extent to which sensitive information is accessed and utilised within e-HRM systems across countries in question.

In any case, as the e-HRMS handle a substantial volume of personal information and data, stringent access controls and security measures are imperative in protection the privacy of public employees. Thus, first and foremost, accessing personal data requires prior consent by the individual. This is the case in all four countries. Public employees are asked to submit a personal consent form before anyone can access their data. However, unlike in Korea, where a separate consent is required for accessing different data, in the Central Asia countries a single consent form covers all data required by the HR units to complete their records. Yet, there have been no

concerns raised by individuals in this regard. In general, access to data involves a comprehensive security clearance process aimed at restricting access to authorised personnel only. In all cases, user authentication and authorisation to accessing data requires registration with the system for obtaining entry credentials, i.e., username, password, etc. Furthermore, access to data is selective in congruence with specific roles, i.e., relevant departments and/or designated individuals have selective access granted to access data pertaining to their specific roles exclusively. Korea has established specific security protocols for accessing information in e-Saram and compliance with these measures is crucial to ensuring the protection of sensitive information and privacy of individuals. Data access is only allowed over a secure private network accessible by public officials only. Korea has also established a personal information protection commission as a watchdog safeguarding personal information and preventing breaches. Kazakhstan has also an established policy pertaining to personal data protection and access. Data access and exchange operates on an isolated and protected network. Access to information is tightly controlled at the functional level, with access granted to specific roles, who perform specific tasks and thus have access to data relevant to their work only. User authentication is required, specific processes vary however, between external and internal users. A similar situation exists in Kyrgyzstan, where security and access control to data is an integral part of the system. The e-HRMS operates on a private network utilising VPN protocol for communication – a standard in place in all four countries. Access to the system is restricted to two types of users, i.e., HR management and general management. In Uzbekistan, the e-HRMS also operates with strict adherence to data protection regulations and standards. User authentication involves multiple security layers utilising electronic digital signatures.

Undoubtedly, the introduction of e-HRMS has been beneficial overall in many different ways. For instance, a significant impact has been on streamlining HR processes and reducing reliance on paper-based documentation. As shown in the Appendix 1, key HR administrative and policy-related processes have transitioned to the respective e-HRMS. Furthermore, the deployment of e-HRMS are transforming the scope of work of human resource management entities. HR personnel, having been freed to a considerable extent from repetitive and time-consuming tasks that have been automated, they can now focus more on strategic and qualitative aspects of human resource management thus contributing to the betterment of the public workforce most suitable for the needs of the 21st century. This surely has elevated their role from the organisational perspective as they have moved away from administrative work per se to performing more strategic level tasks of the HR function. The capability to generate statistics that provide insights into proactive decision making in HR related matters has helped in that direction. This is a feature that is highly valued by policy makers since they can base their decisions using data analytics.

Another important insight deriving from this analysis is that the introduction of e-HRMS is having a significant impact on corporate culture and organisational outcomes in government organisations. As processes have become more transparent and there is reinforced accountability in the system, trust has also increased.

Conversely, although one would also think of cost reduction occurring through automation of processes, it may be premature to quantify such reductions as it will take time to assess the financial benefits stemming from the introduction of the e-HRMS. Additionally, the magnitude of financial and other resources devoted to the development and operationalisation of the e-HRMS will surely take considerable time to offset the benefits derived over time.

The introduction of an e-HRMS denotes a fundamental change in operational processes and information management, the scale of which precludes a number of challenges initially and on the way. A major challenge faced at the beginning stages has been resistance from civil servants to work with the new systems and/or their concerns about confidentiality when electronic versions of disparate paper documentation were consolidated into a single system. Overcoming such a challenge required a concerted effort to enhance e-HRMS functionality and user friendliness coupled with information provision campaigns gradually changing attitudes and perspectives of users over time.

Elements	Korea	Kazakhstan	Kyrgyzstan	Uzbekistan
User levels	Individual	✓		
	Personnel officer	✓		
	HR manager	✓		
	Financial manager	✓		
	Department head	✓		
Integration / Inter-operability	Management	✓		
		- 70 institutions	- 100 information systems	- 61 ministries
		- 180 information systems	- Electronic document management system	- 208 regional administrations
		- Unified system of hardware, software, and databases		- 15 information systems electronic document management system
			- Ministry of Internal Affairs - Registry Office - Ministry of Education - Social Fund - Ministry of Digital Development	
User participation	Interviews	✓		
	Surveys	✓	+	
	Feedback mechanism	✓	✓	✓
	Information campaign	✓		
	Induction	✓		
Training	Periodic	✓	+	✓
	Ad hoc	✓	✓	✓
	Video material	✓	+	✓
	Printed material	✓	✓	✓
	Call centre (dedicated)	✓	✓	✓
Support	Call centre (general)	✓	✓	✓
	Website	✓	+	✓
	Social media	✓		✓
	Person-to-person	✓		✓
	Person consent required	✓	✓	✓
Data privacy protection	User authentication	✓	✓	✓
	Access by role	✓	✓	✓
	Network	Private (closed)	Private (closed)	Open
	Oversight	Personal information protection commission	Agency for Civil Service Affairs	
	Legal framework	Personal Privacy Protection Law (2011)	Law On Personal Data and their Protection (2013)	Law On Personal Information (2008)

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