APPROVED
by the decision of the Board of Directors NPJSC "Abylkas Saginov Karaganda Technical University"
dated September 10, 2025.
(Minutes No.7)

RISK PORTFOLIO,
including the Risk Map, the overall level of risk appetite, and the tolerance levels for key risks.

Abylkas Saginov Karaganda Technical University

Karaganda 2025

CONTENTS

1. BASIC PROVISIONS

The Risk Portfolio is a strategic tool that allows managing the existing risk categories of the Company.

The *focus* of the Risk Portfolio includes the strategic and tactical levels, covers the key areas of the University activities.

The *purpose* of forming the Risk Portfolio is to ensure a holistic view of risks, managing them at the decision-making level.

The main principles and approaches to organizing the corporate risk management and internal control system of Abylkas Saginov Karaganda Technical University NJSC (hereinafter referred to as the Company) are regulated by the Corporate Governance Code dated August 08, 2024 and the Risk Management and Internal Control Policy of Abylkas Saginov Karaganda Technical University NJSC.

The Sustainable Development Center has been defined as the structural unit responsible for risk management and internal control issues of the Company.

The activities to identify, to assess, to prevent risks and to minimize their damage are carried out in accordance with the Corporate Governance Code of the Company in the field of higher and postgraduate education, the joint order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated December 1, 2022 No. 166 and the Minister of National Economy of the Republic of Kazakhstan dated December 2, 2022 No. 116 "On approval of criteria for assessing the degree of risk and checklists for the education system, in terms of higher and postgraduate education", the Risk Management and Internal Control Policy of the Company.

The structure of the risk portfolio is defined as a set of procedures that allow identifying, describing emerging risks, risk owners, and developing risk response measures based on the following procedures:

1) building a risk register containing the information of the identified risks of the Company (risk description, risk factors, risk owner, risk assessment indicators);

2) constructing a risk map indicating the magnitude of their potential impact (damage) and the probability of their implementation (occurrence);

3) establishing risk appetite and risk tolerance for identified risks that allow determining the acceptable amount of risk and/or loss that the Company is ready to accept when achieving strategic goals.

To classify risks in the Company, risks are grouped into the following categories:

- strategic risks;
- financial risks;
- legal risks;
- academic risks;
- operational risks.

2. DETAILING RISK MANAGEMENT WITHIN THE PORTFOLIO

1. Strategic risks (including ecological and social risks)

Principal threats: loss of competitiveness, geopolitical restrictions, non-compliance of educational programs with labor market requirements, non-compliance with ESG standards, social instability, gender inequality, low level of student initiative and leadership.

Assessment methods: multi-factor SWOT and PEST analysis, benchmarking with global universities, sustainable development audit, analysis of social programs, monitoring of inclusiveness, analysis of the Company positioning in national and international rankings, student surveys, evaluation of the effectiveness of existing programs and initiatives.

Management tools: strategic planning, diversification of educational programs, international partnerships, ESG reporting, support for student self-government.

2. Financial risks

Principal threats: decrease in the financial stability of the Company, dependence on a limited number of sources of income, inefficient distribution of resources.

Assessment methods: financial modeling, income and expense analysis, stress testing.

Management tools: development of partnership programs with the industrial sector, budget monitoring, development of an endowment fund and fundraising.

5. Legal risks

Principal threats: changes in current legislation in the field of science and higher education, violations of intellectual property and academic integrity, corruption.

Assessment methods: IT security audit, monitoring of HR metrics, infrastructure assessment, SWOT analysis of the legal environment, analysis of complaints and appeals, surveys of students and employees, benchmarking of intellectual property protection strategies.

Management tools: monitoring of regulatory changes, automated control over contractual obligations.

4. Academic risks (including research activity risks)

Principal threats: declining the quality of education, academic dishonesty, student attrition, intellectual property leakage, ineffective technology transfer.

Assessment methods: rating metrics, student feedback analysis, violation monitoring, patent analysis, grant program audit, ethical assessment of projects.

Management tools: partner diversification, creation of innovation hubs, corporate project management, investing in startup development based on university research, teacher training programs, anti-plagiarism systems, new learning formats.

5. Operational risks

Principal threats: inefficiency of internal process management, bureaucratization, infrastructure and technical risks, cyber threats, personnel problems, physical security risks.

Assessment methods: KPIs and operational efficiency metrics, failure and impact analysis (FMEA), SWOT analysis of operational processes, operational process benchmarking, IT security audit, HR metrics monitoring, infrastructure assessment.

Management tools: assessment of the key performance indicators, identification of critical areas based on questionnaires, regular audit and analysis of operational efficiency, cyber insurance, improving the efficiency of the security system, personnel development programs, personnel development and process automation.

3. FORMING A RISK REGISTER

3.1 Risk identification and assessment

Risk identification is determining the Company's exposure to events, the occurrence of which can negatively affect the ability to achieve planned goals and to implement set objectives, as well as determining the direction and need to improve the risk management process. A combination of various methods and tools is used to identify risks, including the analysis of the Company's main business processes.

Risk identification and assessment is based on the risk management process in accordance with the Risk Management and Internal Control Policy of Abylkas Saginov Karaganda Technical University NJSC.

The risk management process consists of the following components:

- defining the environment;
- risk identification;
- risk assessment;
- risk management;
- risk control;
- information and communication;
- monitoring.

Defining and/or developing the environment is the basis of the risk management process that represents an overview of external and internal factors of the Company activities within the framework of the main strategic goals and objectives, KPI of the Members of the Management Board. The risk management environment can be external and internal.

The external environment represents the external conditions of the Company functioning. The external environment includes the legislative environment, competition from foreign and domestic universities, colleges, the demographic situation, the socio-economic level of the region, the level of training of applicants.

The internal environment determines the general attitude of the Company to risks, and how its employees view and respond to risks. The internal environment is the basis for other components of the risk management and internal control system and includes the Risk Management and Internal Control Policy, Risk Appetite, honesty and ethical values, professionalism, organizational structure, delegation of authority and distribution of responsibility.

3.2. Stakeholders' influence

Additionally, a Stakeholder Map is compiled to identify the instruments of influence of external factors (Appendix 1). The approach of responsible, thoughtful and rational interaction with stakeholders contributes to the sustainable development of the University.

Stakeholders can have both a positive and negative impact on the activities of the University, namely on the growth of the University's value, sustainable development, reputation and image, create or reduce risks.

The University has compiled a stakeholder map based on paragraphs 173-174 of paragraph 19 of the Corporate Governance Code, including potential investors and social partners; partners in the field of education; faculty and university employees; students and their parents; suppliers of goods and services; trade union; local executive bodies, local communities, the population of Karaganda and the Karaganda region, public organizations, the Sole Shareholder[1].

When identifying stakeholders and interacting with them, the University uses international standards for identifying and interacting with stakeholders (AA 1000 Standard, Accountability Principles Standard 2008 "Standard of engagement with stakeholders" 2011 (AA 2011 Stakeholder

[1] Order of the Minister of Science and Higher Education of the Republic of Kazakhstan No. 398 dated August 8, 2024 "On certain issues of corporate governance of higher and postgraduate education organizations"

Engagement Standard 2011), ISO 26000 Guide to Social Responsibility (Guide to Social Responsibility), GRI (Global Reporting Initiative).

Therefore, identifying risks when interacting with stakeholders is one of the components of the University's sustainable development.

The results of implementing the principles of sustainable development include:

1) attracting investment: in the world practice, when determining investment attractiveness, investors take into account the effectiveness in the field of sustainable development;

2) increasing management efficiency and minimizing risks: the integration of environmental and social aspects into the process of making management decisions allows you to expand planning horizons and take into account a more diverse range of risks and opportunities, which creates the prerequisites for sustainable business development;

3) strengthening reputation: improving corporate image is a direct result of sustainable development activities, which increases brand value and builds trust, and also has a positive impact on the quality of interactions with business partners;

4) increasing loyalty from internal and external stakeholders: forming attractive working conditions, opportunities for professional and career growth allows attracting and retaining promising qualified specialists; building an effective dialogue with stakeholders contributes to the formation of a positive environment around the university's activities, which helps to increase its effectiveness due to understanding and support from clients, MSHE, investors, government agencies, local population, public organizations;

5) increasing efficiency: introducing updated technologies allows developing innovative products and services, while increasing competitiveness and efficiency.

To assess the influence of stakeholders on the strategic goals of the company in 2023, a PEST analysis of macroenvironmental factors for the upcoming period was carried out (Appendix 2).

3.2 A Risk Register

The Company annually forms a Risk Register to ensure grouping, identification and detection of specific risks characteristic of each type of the Company's activity.

The Risk Register includes the following elements:

1) the name of the key areas of the Development Program;

2) the type of risk;

3) the risk factor;

4) the risk name;

5) the risk code;

6) the risk level.

The risk level assumes an assessment of each risk by the degree of influence and probability of occurrence on a scale from 1 to 5 points[2].

The formation of the risk register is carried out in the Automated Risk Management System (hereinafter referred to as the ARMS) based on the data provided by the risk owners and the analysis of the environment through a multifactor SWOT analysis, which allows identifying risks through an analysis of the potential environment for their occurrence, including the following areas:

S-O: "strengths - opportunities": the line of strength and opportunities for development implemented through the Company Development Program to achieve the key indicators defined by the Concept for the Development of Science and Higher Education in the Republic of Kazakhstan for 2023 - 2029[3].

Three more areas are a potential environment for the emergence of a Risk Factor and are aimed at developing preventive measures.

[2] Risk level = [impact]*[probability]/2

[3] Decree of the RK Government No. 248 dated March 28, 2023

W-O – “weaknesses – opportunities”: an improvement line that includes proposed ways to level out shortcomings.

S-T – “strengths – threats”: a defense line that defines the use of advantages to protect against uncontrollable external factors.

W-T – “weaknesses – threats”: a prevention line that identifies activities necessary to prevent future risks.

All the identified risk factors are entered into the Incident Register generated in the ARMS.

Heads of the structural divisions of the Company are defined as risk owners in accordance with the Charter and structure of the Company.

To improve the efficiency of the risk management process, an automated risk management system (ARMS) was developed and launched in 2024. It is located at the address: http://st.kstu.kz/. The system provides for the process of electronic documentation of risks and their management.

Based on the results of filling in the ARMS, a consolidated list of risks is generated. To identify key risks, the identified risks are unified. Based on the analysis results, 34 consolidated risks of the Company were identified. The Risk Register of the Company is presented in Appendix 3.

4. RISK MAP

A risk map is a graphical representation of risks depending on the magnitude of their potential impact and the probability of their implementation that is located in a rectangular table, the vertical axis of which indicates the size of the risk damage, and the horizontal axis indicates the probability of its occurrence.

Ranking of the risk assessment is performed using the Probability and Impact Matrix.

At the first stage of constructing the matrix, the input data are determined, the scales of consequences and probabilities are identified. The proposed scale covers a range of types of consequences under study and takes into account the possibility of their occurrence and impact: from the most possible to the least probable ones. The ranking of the risk assessment is presented in Table 1.

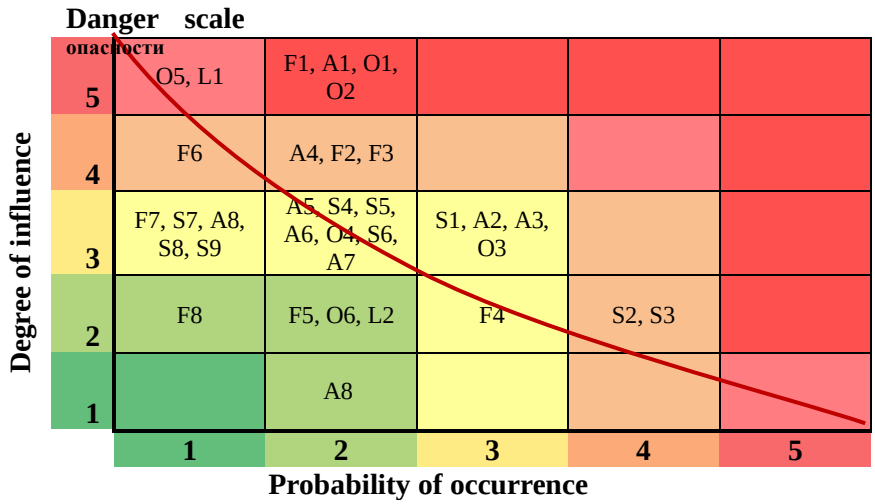
Table 1 – Risk assessment ranking

Level	Risk assessment based on consequences	Risk assessment based on probability of occurrence
5 – critical	A sharp significant decrease in the Company's performance indicators (more than 50%) Emergence of problems with interaction processes within the Company Termination of one or more internal processes Degree of violation: gross	The presence of fundamental differences from the existing situation Introduction of new components or processes High level of complexity of processes Insufficient number or absence of tools for analysis and management
4 – increased	A sharp significant decrease in the Company's performance indicators (more than 40%) Short-term process interruptions Significant difficulties in implementing internal processes Degree of violation: gross	The presence of significant differences from the existing situation Introduction of changes in the implementation of processes High level of complexity of processes Insufficient number of tools for analysis and management
3 – medium	Significant decrease in the Company's performance indicators (less than 40%) Emergence of problems with the implementation and management of interaction processes within the Company Lack of resources to continue one or more processes Degree of violation: significant	Minor differences from the existing situation Processes, despite their complexity, are controllable and manageable Analysis and management tools have been developed

2 – low	Minor decrease in performance indicators (<15%) of the Company Short-term slowdowns in processes Restoration of interaction processes within the model Additional resources are required Strengthening of control is necessary Degree of disruption: minor	Components involved in interaction processes have already been used before Medium level of complexity of processes Efficient tools for analysis and management
1 – insignificant	Minor decrease in performance indicators (<15%) of the Society Short-term slowdowns in processes Self-healing of interaction processes within the model Strengthening of control is necessary Degree of disruption: minor	Components involved in interaction processes have already been used before Low level of process complexity Efficient tools for analysis and management

The vertical axis of the risk map shows the increasing level of consequences (from 1 to 5), and the horizontal axis shows the increasing probability of each consequence (the risk level increases from the lower left to the upper right corner of Table 2). To display the degree of risk, the map is divided into green, yellow and red zones. The maximum degree of influence and the maximum probability of risk occurrence are the key points of the Danger Scale.

Table 2 – Risk Map



Based on the results of filling out the risk map, key risks are identified, and a list of preventive and reactive measures is formed.

The key risks of the Company include risks located on the Risk Map in the zone above the Hazard Scale, or in the zones that it intersects (Table 3).

Table 3 – Key risks of the Company

No	Risk name	Risk code	Influence	Probability
1.	Risk of decreasing the University income	F1	5	2
2.	Risk of decreasing the quality of students' practical skills	A1	5	2
3.	Risk of non-compliance with information security requirements	O1	5	2

No	Risk name	Risk code	Influence	Probability
4.	Risk of providing false information to external information systems and databases	O2	5	2
5.	Risk of reducing the quality of the teaching staff	S1	3	3
6.	Risk of reducing the focus of scientific research on the needs of production and business	A2	3	3
7.	Risk of reducing international collaborations and publication activity of the university's teaching staff	A3	3	3
8.	Risk of inconsistency of the digital competencies of employees with the requirements of the time	O3	3	3
9.	Risk of reducing the quality of teaching	A4	4	2
10.	Risk of reducing the productivity of employees	F2	4	2
11.	Risk of obsolescence of the material and technical base and its inconsistency with conducting research focused on the needs of modern industries	F3	4	2
12.	Risk of reducing the involvement of students in social and educational activities	S2	2	4
13.	Risk of non-compliance of the internal quality assurance system with international standards	S3	2	4
14.	Risk of no growth in additional income of the teaching staff from various types of academic activities	F4	2	3
15.	Risk of decreasing the number of selling RSSTA of TRL 7-9 level	A5	3	2
16.	Risk of decreasing positions in the international QS ranking	S4	3	2
17.	Risk of decreasing positions in the national institutional ranking among technical universities	S5	3	2
18.	Risk of decreasing the contingent of graduation from educational programs of VET, bachelor's, master's and doctoral studies	A6	3	2
19.	Risk of non-compliance with internal regulations and labor discipline of the teaching staff and employees	O4	3	2
20.	Risk of insufficient centralized management of innovative projects	S6	3	2
21.	Risk of a decrease in the number of students studying in additional education programs	A7	3	2
22.	Risk of violation of qualification requirements	O5	5	1
23.	Risk of administrative, corrupt and criminal violations by students and employees	L1	5	1
24.	Risk of decreasing profitability from the University research activities	F6	4	1

5. RISK APPETITE AND TOLERANCE

5.1. Determining risk appetite

5.1.1. In pursuing its mission, vision and goals set out in the Development Program and the other strategic documents, the Company accepts a level of risk proportionate to the expected benefits it can receive and the scale or probability of damage.

5.1.2. The Company determines the risk appetite for each of the established strategic goals.

5.1.3. Risk appetite determines the upper limit of the level of critical risks at the consolidated level that the Company is ready to accept. It also influences the allocation of resources, the organization of processes and the creation of the infrastructure within the university necessary for effective monitoring and response to risks.

5.1.4. Risk appetite (risk appetite statement) of the Company for the planning period on a consolidated basis is approved by the Board of Directors and has the following characteristics:

1) reflects the Company's strategy, including goals, objectives, financial constraints and stakeholder expectations;

2) covers all key aspects of activity;

3) takes into account the desire and ability to take risks;

4) defines the Company's attitude to risk;

5) is periodically reviewed taking into account the assessment of external and internal economic indicators;

6) requires effective risk monitoring.

5.1.5 To determine risk appetite and risk tolerance, a risk category is established in accordance with the method of its processing and options for applicable measures (Table 4).

Table 4 – Risk category in accordance with the method of its processing

Method of processing	Variants of activities	Risk category	Risk appetite
Evasion/ Avoidance/ Exclusion	Complete elimination of a certain threat or risk source by eliminating a potential source of a negative situation	**Inadmissible**	Unfavorable
Mitigation/ Reduction	Reducing the probability of occurrence and/or the amount of possible losses from the occurrence of a negative situation. However, the source of risk is not eliminated.	**Justified**	Cautious
Transfer/ Separation	Transferring responsibility for risk management to other participants without eliminating the source of risk		Moderate
Acceptance/ Retention	Confirmation of a possible negative situation and a conscious decision to accept its consequences and compensate for the damage at one's own expense.	**Acceptable**	Low

5.2. Risk Appetite Statement

5.2.1 The Company recognizes that its risk appetite is constantly changing as it responds to internal and external changes. At any given time, the Company is prepared to accept additional risks in one area while mitigating them in another. As part of the annual risk analysis, the risk appetite will be compared with current strategic and operational needs.

5.2.2. The Company's approach to risk is to minimize the negative impact on the achievement of key strategic goals and objectives:

1) The Company will not compromise compliance with the principles of anti-corruption legislation, legislative norms and qualification requirements in the field of higher education, information security and dissemination of information about its activities.

2) The Company will agree to higher academic and financial risks if a clear return and a positive impact on its strategic ambitions are demonstrated.

3) The Company adheres to a cautious strategy in the implementation of general management and personnel management processes, preventing a negative impact on employees. At the same time,

the Company is ready to assume certain risks in personnel management to improve the quality of educational services.

4) The Company is ready to consider optimal solutions in the area of social and educational policy and partnership with enterprises and organizations in the event of a predicted increase in the effectiveness of programs and projects implemented in the Company.

5) The Company is ready to assume certain risks in the area of scientific management and development of the material and technical base, as well as technologies, if innovations and improvements to key systems and services pay off.

Table 5 – Risk appetite matrix

Process management	Unfavorable *Preventing risks and uncertainty*	Cautious *Preference is given to safe options that have a low degree of risk and may have limited potential for profit.*	Moderate *Readiness to consider all possible options and select the one that is most likely to lead to successful implementation at an acceptable level of remuneration and value for money*	Low *Search for innovative ideas and choose options that offer potentially higher returns, despite the high risks inherent in this process*
Strategic management	**L1, O5, O2, O1**	**F1, S4, S5, S3**		
Personnel management	**O4**	**F2, F4, S1, O3**		
Management of infrastructure development and material support of processes				**F3**
Management of social and educational activities (Third mission)			**S2**	
Management of educational activities	**A1**	**A4, A6**	**A7**	
Management of scientific activities		**A3, A5**	**A2, F6**	**S6**

The risk appetite matrix includes division into categories of management of the main processes of the university and assumes the designation of an expressed attitude to risk (risk appetite):

- **unfavorable**, providing for complete prevention of the occurrence of a risk event or exclusion of its causes in the field of personnel management and educational activities in terms of allowing corruption;
- **cautious**, providing for the search for safe options for achieving strategic goals in the field of general management, personnel management, management of social and educational, educational and research activities;
- **moderate**, in which options can be considered that allow achieving an optimal ratio of costs and results in the field of all the types of management, with the exception of some general issues;
- **low**, implying the search for innovative ideas associated with significant costs, but potentially bringing the most effective result in the field of infrastructure development and management of scientific activities.

5.3 Risk tolerance

5.3.1. To effectively monitor and prevent the risk appetite level from being exceeded, the Company applies risk tolerance

Risk tolerance levels for key risks are approved based on two main approaches:

1) objective approach takes into account the requirements of laws, regulatory legal acts of state supervisory authorities, and internal regulatory documents of the Company;

2) subjective approach: risk tolerance levels for key risks are determined by interviewing or questionnaires among experts. With this approach, experts, based on their experience and knowledge, determine the threshold level, which is the risk tolerance level for the key risk.

Risk tolerance for key strategic indicators and KPIs of the Management Board Members represents the maximum permissible deviation from the existing risk level, and is indicated by risk owners in the table of the company's tolerance for key risks in the "Risk Tolerance" column.

Activities within the risk tolerance levels for key risks provide the management with a higher degree of confidence in the effectiveness of achieving the set goals without exceeding the risk appetite.

After the risk tolerance is approved, the risk tolerance levels are monitored. The risk tolerance levels are revised in the event of the emergence/identification of new risks or the occurrence of risk events. The responsible unit monitors compliance with the risk tolerance levels for key risks on a quarterly basis in accordance with the following procedure:

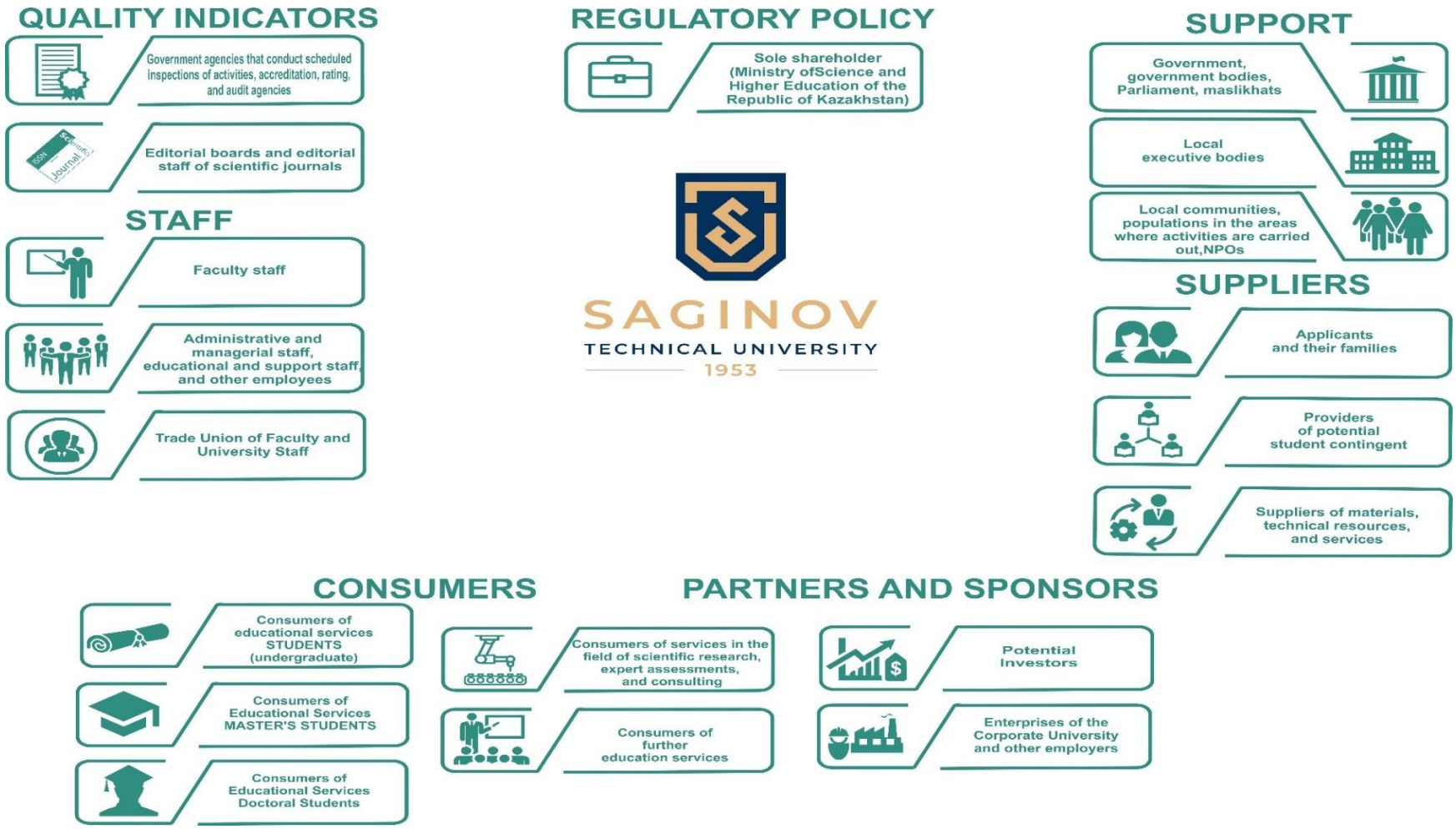
1) comparison of the actual results of deviation of the risk tolerance levels from the planned indicators;

2) in the event of a deviation, the responsible unit, together with the interested structural units, determines the causes and takes additional measures to reduce the impact, as a result of which the actual indicators of the risk tolerance levels are aligned within the established planned corridor for each risk or revised.

The Company tolerance for key risks is presented in Appendix 4.

Appendix 1 Stakeholder map

Stakeholder map



Stakeholders	Contribution, influence	Expectation, interest	Level of interaction	Methods of interaction
Direct stakeholders				
Sole Stakeholder (RK Ministry of Science and Higher Education)	Implementation of the powers of the Sole Shareholder, provided for in the legislative acts of the Republic of Kazakhstan and the Charter of the Company	Ensuring the quality of services in the field of higher and postgraduate education, promoting university science, strengthening the university brand Increasing the tertiary education of the population Improving the quality of scientific research Commercialization of RSSTA Increasing income from scientific research	Empowerment Coordination of activities Bilateral cooperation; joint development of experience and knowledge, decision-making and action Grant funding PTF	Multi-stakeholder forums; Advisory panels Integrating stakeholder engagement into governance, strategy and operations. Reporting information
Enterprises of Corporate University and other employers	Updating the University material and technical base, organizing internships for faculty, attracting leading specialists to design and evaluate educational programs, and conduct classes Financial resources, searching for new ideas and ways to collaborate in conducting scientific research Grant and scholarship programs	Specialists with competencies in demand for a specific enterprise Obtaining relevant research results for the purpose of their subsequent commercialization and/or implementation in practice Participation in professional events and recognition of the role of stakeholders	Negotiations, cooperation in the field of designing educational programs Implementation of joint educational, scientific and research activities. Activities for the development of human resources	Collective negotiations based on the principles of social partnership
The teaching staff	Human resources, high level of teaching, loyalty, high corporate culture	High wages, good working conditions, social stability, professional development and recognition of professional qualifications	Multilateral interaction; building up experience and knowledge from all sides. Operational interaction	Participatory decision making process; focus groups; feedback schemes
Administrative-managerial personnel, educational-support staff and others	Ensuring the University activities through the availability of relevant competencies, support and implementation of management decisions	High wages, good working conditions, social stability, professional development and recognition of professional qualifications and incentives	Multilateral interaction; building up experience and knowledge from all sides. Operational interaction Talent management HIPO employee support	Participatory decision making process; focus groups; feedback schemes
Trade Union of the teaching staff and employees of the University	Promoting social stability, regulating labor relations and resolving conflicts Promoting the development of scientific schools, conducting research and commercializing R&D results.	Respect for workers' rights, good working conditions Social recognition, employee development programs	Multilateral cooperation on issues of ensuring workers' rights and social guarantees	Joint decision making process Collective bargaining
Consumers of educational services STUDENTS (bachelor students)	Financial resources: - government grants; - self-payment for tuition; Assistance to the development of the	Obtaining a high-quality education, guaranteed demand in the labor market, postgraduate support Opportunity to obtain social connections	Multilateral interaction; building up experience and knowledge from all sides. Operational interaction	The learning process Social programs Consultations Feedback schemes

Stakeholders	Contribution, influence	Expectation, interest	Level of interaction	Methods of interaction
	university after graduation, including donations to the endowment fund	for the future Opportunity to gain experience in organizational work Opportunity to launch a startup		
Consumers of educational services MASTER STUDENTS	- government grants; - self-payment for tuition; Assistance to the development of the university after graduation, including donations to the endowment fund. Potential employees.	Obtaining high-quality postgraduate education, guaranteed demand in the labor market, career growth	Multilateral interaction; building up experience and knowledge from all sides. Operational interaction	The learning process Consultations Organization of research management Publication activity Feedback schemes
Consumers of educational services DOCTORAL STUDENTS	- government grants; - self-payment for tuition; Assistance to the development of the university after graduation, including donations to the endowment fund. Potential employees. Promoting the development of scientific schools, conducting research and commercializing R&D results.	Obtaining high-quality postgraduate education Implementation and financing of scientific initiatives Guaranteed employment Career growth	Multilateral interaction; building up experience and knowledge from all sides. Operational interaction	The learning process Consultation Organization of management, management and funding of scientific research. Publication activity Feedback schemes
Applicants and their families	Formation of the first-year contingent Increasing the university's income Attracting potential students through existing social connections	Obtaining a high-quality education Demand in the labor market Prestige of the diploma Social support	Multilateral interaction; building up experience and knowledge from all sides. Operational interaction	Career guidance Regular meetings Feedback schemes
Consumers of services of additional education	Increasing the university's income Increasing a positive image of the university Attracting new consumers of additional education services	Formation of new skills and competencies Certified courses Development of long-term cooperation Recognition of acquired skills	Multilateral interaction; Operational interaction	The learning process Consultations Formation of long-term programs of additional education within the framework of continuous education
Consumers of services in the field of research, expertise and consulting	Financial resources, material-technical resources, search for new ideas and ways of cooperation	Obtaining research results relevant to the request for the purpose of their subsequent commercialization and/or implementation in practice	Bilateral or multilateral interaction; joint development of experience and knowledge, decision-making and action	Joint projects; joint ventures; partnerships; joint initiatives of interested parties
Editors and editorial boards of scientific journals	Reviewing and publishing scientific papers	Formation of a pool of authors with a high citation index quality publication	Bilateral or multilateral interaction	Preparing papers for publishing; publication of scientific papers

Stakeholders	Contribution, influence	Expectation, interest	Level of interaction	Methods of interaction
State bodies carrying out scheduled inspections of activities, accreditation, rating, audit agencies	Verification of compliance of activities with current norms and standards	Improving the quality of functioning of the OVPO, implementing recommendations	Bilateral or multilateral interaction; joint development of experience and knowledge, decision-making and action	Scheduled and unscheduled audits, self-reports
Indirect stakeholders				
Potential investors	Financial resources (equity capital), including the formation of an endowment fund Investments in the creation of startups by students and faculty Co-financing of scientific research	Return on investment formation of personnel reserve of enterprise employees modernization of production facilities through the introduction of RSSTA	Bilateral or multilateral interaction; joint development of experience and knowledge, decision-making and action	Joint projects; partnership
Local executive bodies	Support in the areas of activity; loyalty and support of local authorities; favorable attitude; cooperation Financial resources Education grants Scholarships for talented students	Forming additional work places, region development	Bilateral or multilateral interaction; joint development of experience and knowledge, decision-making and action	Joint projects; joint ventures, partnership, joint initiatives of stakeholders
Local communities, population in the places of exercising activities, SPA	Forming a positive image, supporting initiatives	Social well-being Work places Quality education	Implementation of the Third mission of the University	Support and implementation of socio-economic initiatives in the region
Suppliers of the potential contingent of students[4]	A flow of applicants oriented to study at the University	Lifelong learning implementation, development of human capital	Bilateral or multilateral interaction	Career guidance Strengthening human resource potential
Suppliers of material-technical resources and services	Integrating stakeholder engagement into management, strategy and operations Participation in government contracts (for organizing events directly and indirectly)	Reliable sales market, regular solvent buyer	Bilateral or multilateral interaction	Concluding ncontracts. Purchasing resources
Government, state bodies, Parliament, maslikhats	State regulation. Involvement of students to participate in events on a paid basis	Taxes, solving social problems Ensuring socio-political stability Training of personnel in various areas of development of the Republic of Kazakhstan	Granting of authority Bilateral cooperation Participation of the University in the events of the CGB without payment	Integrating stakeholder engagement into management, strategy and operations.Participation in government contracts.

[4] Organizations of nsecondary, technical and vocational, higher and postgraduate education

Stakeholder influence and significance assessment

1. Attribute assessment: Power, Legitimacy, Urgency

Power is the stakeholder's power of influence on the Company, i.e. its ability to influence the activities of the Company, people making decisions on key issues of the Company's activities (regulatory, financial, administrative or political).

Legitimacy is the legality or socially acceptable participation of the stakeholder in the activities of the university. Legitimate stakeholders have justified interests and rights in relation to the Company.

Urgency is the relevance and urgency of the demands made by or to the Company (temporary pressure, significance of the topic for the stakeholder).

Based on the assessment of attributes, stakeholders are assigned a category that determines their role in the activities of the Comany: dominant, categorical, inactive, demanding, dependent.

No.	Stakeholder	Urgency	Legitimacy	Power	Category
1.	RK MSHE	High	High	Medium	Dominant
2.	Enterprises of the Corporate University and other employers	High	Medium	High	Dominant
3.	Faculty staff	Medium	High	High	Dependent
4.	Administrative and managerial staff, educational and managerial staff and other employees of the university	Medium	Medium	Medium	Dependent
5.	Trade union of faculty and employees of the university	Medium	High	Medium	Dominant
6.	Consumers of educational services: Students (bachelor's degree)	Low	Medium	Medium	Demanding
7.	Consumers of educational services: Master students	Low	Medium	Medium	Demanding
8.	Consumers of educational services: Doctoral students	Low	Medium	Medium	Demanding
9.	Applicants and their families	Low	Medium	Medium	Demanding
10.	Consumers of additional education services	Low	Medium	High	Inactive
11.	Consumers of services in the field of research, conducting examinations and consulting	Medium	Medium	Medium	Dependent
12.	Editors and editorial boards of scientific journals	Low	Medium	Medium	Dependent
13.	Government agencies carrying out scheduled inspections of activities, accreditation, rating, audit agencies	High	Medium	High	Categorical
14.	Potential investors	Medium	High	Medium	Dependent
15.	LEB	Medium	Medium	Medium	Dependent
16.	Local communities, population in places of activity, SPAs	Low	Medium	Medium	Dependent
17.	Organizations of secondary, technical and vocational, higher and postgraduate education	Low	Medium	Medium	Dependent
18.	Suppliers of material and technical resources and services	Low	Medium	Medium	Dependent
19.	Government, government agencies, Parliament, maslikhats	High	High	Medium	Dominant

2. Calculating the degree of stakeholder significance

The calculation is made taking into account the feedback; participation in the Company's initiatives; behavior in crisis situations; analysis of publications, statements, participation in management bodies according to the following criteria:

Signs for a positive value (support)		Signs for negative value (opposition)	
Point	**Characteristic**	**Point**	**Characteristic**
+5	Actively supports the Company's strategic goals, participates in their implementation	–1	Expresses doubts, puts forward disagreement
+4	Supports initiatives, participates in joint projects	–2	Actively criticizes in public space
+3	Loyal partner, ensures cooperation without initiative	–3	Participates in actions that undermine the initiatives of the Society
+2	Passively supports, does not interfere	–4	Systematically blocks initiatives
+1	Interested, but does not interact	–5	Openly opposes, organizes resistance
0	Neutral	0	Neutral

The degree of influence on the activities of the Company is assessed by: the ability to change the policy of the University or the structure of programs; administrative and regulatory role; the economic dependence of the Company on the stakeholder; the significance of feedback.

To assess there are used the following criteria:

Point	Criterion description
5	Can influence strategy, budget, accreditation, appointment of management
4	Determines training areas, influences reputation
3	Participates in operational decisions (e.g.: teaching staff, administrative and management personnel, administrative and management personnel, etc.)
2	Has limited influence (e.g.: students)
1	Single indirect influence (e.g.: some service consumers, media)
0	Effective lack of influence

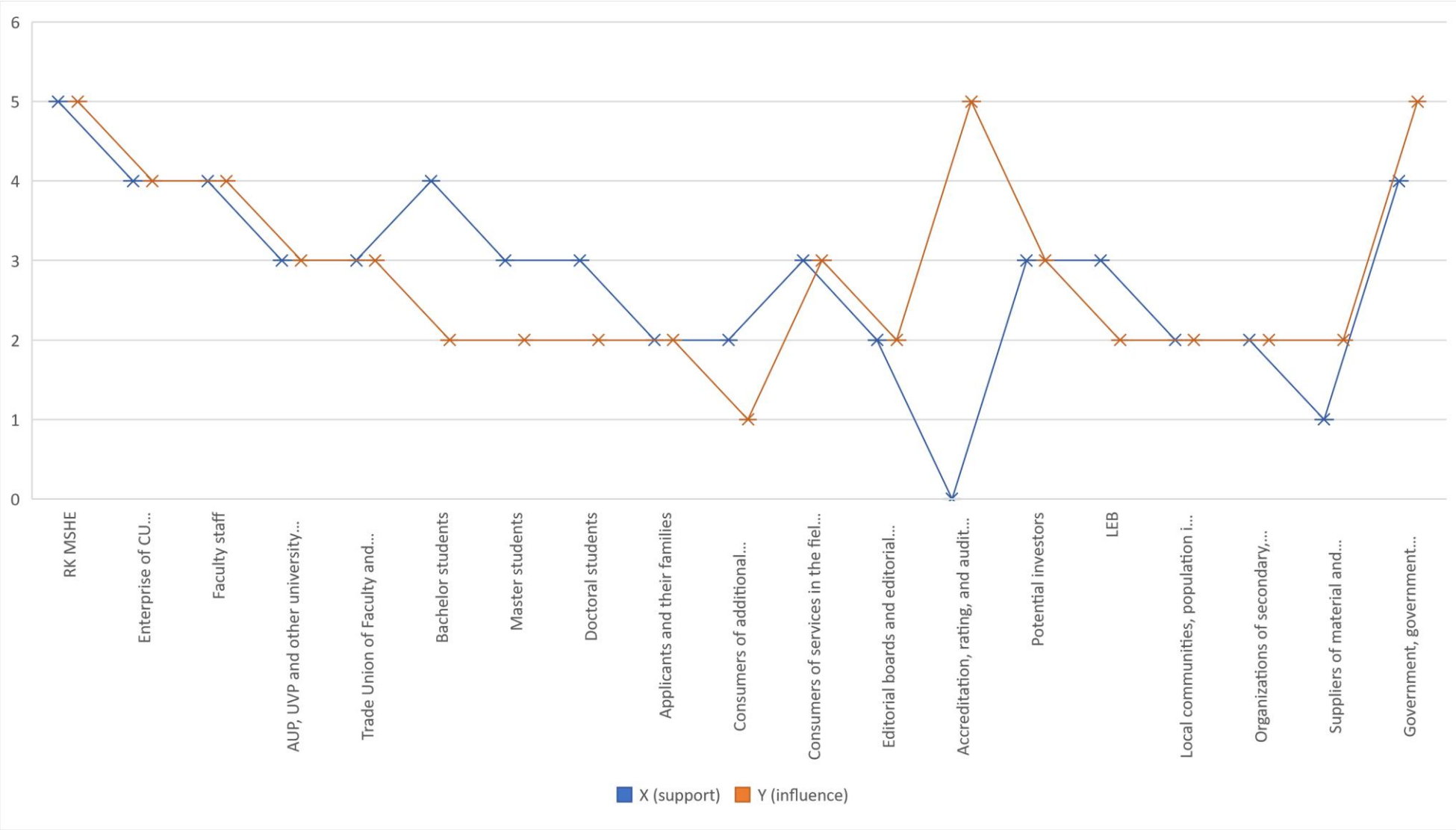
3. Calculation of the final significance indicator

No.	Stakeholder	X (Support)	Y (Influence)	D = X + Y	Interpretation
1.	RK MSHE	+5	5	10	Critical
2.	Enterprises of the Corporate University and other employers	+4	4	8	High Importance
3.	The teaching staff	+4	4	8	High Importance
4.	AMP, ESP and other employees of the university	+3	3	6	Medium Importance
5.	Trade union of the staff and employees of the University	+3	3	6	Medium Importance
6.	Consumers of educational services: Students (bachelor's degree)	+4	2	6	Medium Importance
7.	Consumers of educational services: Master students	+3	2	5	Medium Significance

No.	Stakeholder	X (Support)	Y (Influence)	D = X + Y	Interpretation
8.	Consumers of educational services: Doctoral students	+3	2	5	Medium Significance
9.	Applicants and their families	+2	2	4	Low Significance
10.	Consumers of additional education services	+2	1	3	Low Significance
11.	Consumers of services in the field of scientific research, examination and consulting	+3	3	6	Medium Significance
12.	Editorial boards and editorial boards of scientific journals	+2	2	4	Low Significance
13.	Government agencies that carry out scheduled inspections of activities, accreditation, rating, audit agencies	0	5	5	Required Controllers
14.	Potential investors	+3	3	6	Medium Significance
15.	LOIs	+3	2	5	Medium Significance
16.	Local communities, population in the places of activity, NGOs	+2	2	4	Low Significance
17.	Organizations of secondary, technical and vocational, higher and postgraduate education	+2	2	4	Low Significance
18.	Suppliers of material and technical resources and services	+1	2	3	Low Significance
19.	Government, government agencies, Parliament, maslikhats	+4	5	9	Critical

The final significance indicator is interpreted depending on the following criteria:

Range D	Category of significance	Interpretation and potential strategy of interaction
8 – 10	Critically high significance	The stakeholder provides support and has maximum influence. Requires inclusion in strategic management.
6 – 7.9	High significance	The stakeholder is an active partner or influential internal actor. Constant dialogue and participation in coordination are required.
5 – 5.9	Medium significance	Important for operational activities. Regular contact is required, but participation in strategy is not required.
2 – 4.9	Low significance	Limited influence or passive support. Interaction is situational.
0 – 1.9	Very low significance / peripheral	Minimal influence, little support. Monitoring the status, informing if necessary.
< 0	**Conflict stakeholder**	Potential source of resistance or reputational risks. Measures to neutralize threats or manage conflict are needed



Prioritization of stakeholder opinions in macroenvironment analysis: stakeholders with a high D (≥5) are included in the expert panel or priority survey when determining the most significant and unstable factors of the macroenvironment.

Appendix 2 PESTEL-analysis of macroenvironment factors

PESTEL-analysis of macroenvironment factors

In assessing the macroenvironmental factors, the Company identified the following groups of factors that have a potential impact on its activities:

1. Political and legal factors

- State regulation of the higher education system (Ministry of Higher Education of the Republic of Kazakhstan, government acts, Presidential Decrees, resolutions).
- Changes in the regulatory framework, including: standards for educational programs; mechanisms for transformation into research universities; implementation of ESG principles in higher education institutions; requirements for digitalization of the university's main processes.
- Licensing and accreditation policy: institutional and specialized accreditation; requirements for academic integrity and quality management.
- Visa policy and international academic mobility: access for foreign faculty and students; support for double degree initiatives and foreign internships.
- State and grant funding: grants for training, research projects, start-ups; funding policy for applied research and R & D.
- State regulation of competition in higher and postgraduate education

2. Economic factors

- Purchasing power of potential consumers of services in the field of higher and postgraduate education.
- Inflationary processes affecting the cost of educational services and purchasing power.
- Dynamics of development of industrial sectors and the need to form new competencies
- Labor market conditions and the transition to a digital and "green" economy.
- Competition from other universities in Kazakhstan, the CIS and online platforms.
- Currency fluctuations and import dependence in equipment and scientific technology.
- Availability of grants, venture and private financing for university start-ups.

3. Social and demographic factors

- Decrease in the number of school graduates in a number of regions (impact on admission).
- Educational migration of young people to megacities and abroad.
- Outflow of teaching staff and aging of the faculty.
- Social status of teachers, salary levels, support programs for HIPO employees.
- Value shifts in generations Z and Alpha: expectations of flexibility, career trajectory, social contribution.

- Influence of media, digital platforms and social networks on the perception of the university brand.
- The role of parents and families in choosing a university and educational trajectory.

4. Scientific-technological factors

- Accelerated technological transformation of Industry 4.0 — requirements for digital and engineering competencies.
- Integration of universities into R&D chains with industrial partners.
- Capitalization of research through startups, technology parks, technology transfer.
- International scientific cooperation, Horizon Europe, Erasmus+, PRIMA programs, etc.
- Digitalization of the educational process: LMS, AI in training, AR/VR technologies.
- Institutional capacity to generate scientific products (citation indices, publications in Scopus/WoS).

5. Ecological factors

- Expectations for sustainable development (ESG): energy efficiency of buildings; waste management; green campuses.
- Transition of the region's industry to a low-carbon economy — changing the profile of specialist training.
- Impact of the region's environmental situation on the university's image and students' health.

6. Cultural and ethical factors

- Intercultural communication and internationalization of education.
- Growing importance of academic and scientific ethics.
- Traditional cultural norms and their influence on the content and methods of teaching.
- Anti-corruption culture

The degree of influence of each factor on the activities of the company was determined on the following scales:

1. The influence of each factor on a scale from 1 to 5 (1 - minimal influence, 5 - maximum influence of the factor)

2. The probability of change of each factor on a three-point scale (where 0 - the factor will cease to exist in the future, 1 - the factor will not change in the near future, 2 - the factor will increase in the near future).

For the assessment, 14 experts were involved - representatives of stakeholder groups with a high importance indicator ($D \geq 5$). At the same time, for stakeholders who are students, the average values of the survey assessments were used (REDD for students - 19 people, REDD for master students - 72 people, REDD for doctoral students - 55 people).

Based on the weighted average value ($N_{av} \geq 3.8$) for each factor, taking into account the forecast of changes, the Final PEST analysis matrix with ranked factors of the macroeconomic environment was compiled.

Political and legal		**Economic**	
Changes in the regulatory framework, including: standards for educational programs; mechanisms for transformation into research universities; implementation of ESG principles in higher education institutions; requirements for digitalization of the university's main processes.	4,15	Inflationary processes affecting the cost of educational services and purchasing power	4,31
State regulation of the higher education system (Ministry of Higher Education of the Republic of Kazakhstan, government acts, Presidential Decrees, resolutions).	4,08	Purchasing power of potential consumers of services in the field of higher and postgraduate education	4,19
State and grant funding: grants for training, research projects, start-ups; funding policy for applied research and R&D	3,92	Competition from other universities in Kazakhstan, the CIS and online platforms	4,08
		Dynamics of development of industries and the need to form new competencies	4,04
		Currency fluctuations and import dependence in equipment and scientific technology	3,88
Social and demographic		**Scientific-technological**	
Educational migration of young people to megacities and abroad	4,27	Accelerated technological transformation of Industry 4.0 — requirements for digital and engineering competencies	4,27
Decrease in the number of school graduates in a number of regions (impact on admission)	4,19	Integration of universities into R&D chains with industrial partners.	4,15
Outflow of teaching staff and aging of the faculty	4,15	Capitalization of research through startups, technology parks, technology transfer	3,96
Social status of teachers, salary level, support programs for HIPO employees	3,96	Digitalization of the educational process: LMS, AI in training, AR/VR technologies	3,92
Influence of media, digital platforms and social networks on the perception of the university brand	3,81	Institutional capacity to generate scientific products (citation indices, publications in Scopus/WoS)	3,85
			3,88
Ecological		**Cultural and ethical**	
Expectations for Sustainable Development (ESG): energy efficiency of buildings; waste management; green campuses	4,0	Growing importance of academic and scientific ethics	4,04
		Intercultural communication and internationalization of education	3,96
		Anti-corruption culture	3,88

Based on the obtained results of the analysis, scientific and technological factors were identified as the most risk-generating factors of the macroenvironment (average rank 4.01); the ratio of macroenvironment factors and names of potential risks was determined, the risk classifier was updated with the definition of a group of risk factors for further work with risk owners.

Appendix 3 Risk Register

RISK REGISTER
Abylkas Saginov Karaganda Technical University NJSC

No	Distribution of risks among Board Members	Strategic goal	Risk name	Macroenvironment factor	Risk factor	Risk type	Risk code	Risk level
1	Chairman of the Management Board, Rector	Increasing the financial and economic stability and development of the material and technical base of the university	Risk of reducing the University income	Purchasing power of potential consumers of services in the field of higher and postgraduate education Institutional capacity to generate scientific products (citation indices, publications in Scopus/WoS) State and grant funding: grants for training, scientific projects, start-ups; funding policy for applied research and R&D	Reduction in contingent Reduction in the effectiveness of research and development and business contract activities	Financial	F1	5
2	Vice-rector for Academic Affairs	Consumer focus (employers, students, society)	Risk of reducing the quality of practical skills of students	Dynamics of industrial development and the need to develop new competencies Accelerated technological transformation of industry 4.0 - requirements for digital and engineering competencies	Weak partnerships with enterprises	Academic	A1	5
3	Vice-rector for SD&D	Ensuring effective management	Risk of non-compliance with information security requirements	Digitalization of the educational process: LMS, AI in training, AR/VR technologies	Imperfection of the information security system, failure to comply with requirements for ensuring information security; loss or availability of documents intended for official use	Operational	O1	5
4	Vice-rector for SD&D	Ensuring effective management	Risk of providing false information to external	Digitalization of the educational process: LMS, AI in training, AR/VR technologies	Failure to fill out information in the university's LMS	Operational	O2	5

No	Distribution of risks among Board Members	Strategic goal	Risk name	Macroenvironment factor	Risk factor	Risk type	Risk code	Risk level
			information systems and databases					
5	Vice-rector for SI	Highly qualified human resources	Risk of reducing the quality of the teaching staff	Institutional capacity to generate scientific products (citation indices, publications in Scopus/WoS)	Lack of continuity of scientific schools, reduced quality of support for young scientists, including when defending their dissertations	Strategic	S1	4,5
6	Vice-rector for SI	Consumer focus (employers, students, society)	Risk of decreasing orientation of scientific research to the needs of production and business	Integration of universities into R&D chains with industrial partners	Lack of sustainable cooperation between specialized departments and industrial enterprises	Academic	A2	4,5
7	Vice-rector for SD&D	Ensuring effective management	Risk of decreasing international collaborations and publication activity of the university faculty	International scientific cooperation, Horizon Europe, Erasmus+, PRIMA, etc. programs	Weak partnerships with foreign universities	Academic	A3	4,5
8	Vice-rector for SD&D	Highly qualified human resources	Risk of inconsistency of digital competencies of employees with the requirements of the time	Digitalization of the educational process: LMS, AI in training, AR/VR technologies	Lack of available resources for training	Operational	O3	4,5
9	Vice-rector for AA	Consumer focus (employers, students, society)	Risk of decreasing quality of teaching	Dynamics of industrial development and the need to develop new competencies	Changes in the composition of the teaching staff due to various reasons (including staffing with people who do not have teaching experience / certificates of advanced training in the field of pedagogy)	Academic	A4	4
10	Chairman of the Management Board, Rector	Increasing the financial and economic stability and development of the material and technical base of the university	Risk of decreased productivity of workers	Accelerated technological transformation of industry 4.0 — requirements for digital and engineering competencies	Decreasing the University income	Financial	F2	4

No	Distribution of risks among Board Members	Strategic goal	Risk name	Macroenvironment factor	Risk factor	Risk type	Risk code	Risk level
11	Vice-rector for SI	Consumer focus (employers, students, society)	Risk of obsolescence of the material and technical base and its inadequacy for conducting research focused on the needs of modern industries	Social status of teachers, salary levels, support programs for HIPO employees	Reduction in the volume of financial resources and sponsorship assistance to departments from enterprises	Financial	F3	4
12	Vice-rector for SEW	Consumer focus (employers, students, society)	Risk of decreased involvement of students in social and educational activities	Currency fluctuations and import dependence in equipment and scientific technology	Compulsory involvement of students in social and educational activities (for quantity)	Strategic	S2	4
13	Vice-rector for SD&D	Highly qualified human resources	Risk of inadequacy of the internal quality assurance system to international standards	Value shifts in generations Z and Alpha: expectations of flexibility, career trajectory, social contribution	Absence of advanced training programs in specialized areas for employees of departments	Strategic	S3	4
14	Vice-rector for AA	Highly qualified human resources	Risk of no growth in additional income of the teaching staff from various types of academic activities	Social status of teachers, salary levels, support programs for HIPO employees	Low motivation of teaching staff to participate in advanced training programs, language courses, development of digital educational resources)	Financial	F4	3
15	Vice-rector for SI	Highly qualified human resources	Risk of a decrease in the number of selling RNNTD of TRL level 7-9	Social status of teachers, salary levels, support programs for HIPO employees	Low quality and / or absence of significant results of scientific and scientific-technical activities that have potential for commercialization	Academic	A4	3
16	Vice-rector for SD&D	Ensuring effective management	Risk of a decrease in positions in the international QS ranking	Visa policy and international academic mobility: access for foreign faculty and students; support for double degree initiatives and international internships	Change in the methodology of the QS rating	Strategic	S4	3
17	Vice-rector for SD&D	Ensuring effective management	Risk of declining positions in the national institutional ranking among technical universities	Competition from other universities in Kazakhstan, the CIS and online platforms	Weakening of positions compared to competitive universities	Strategic	S5	3

No	Distribution of risks among Board Members	Strategic goal	Risk name	Macroenvironment factor	Risk factor	Risk type	Risk code	Risk level
18	Vice-rector for SEW	Consumer focus (employers, students, society)	Risk of decreasing the number of graduates in educational programs of technical and vocational education, bachelor's, master's and doctoral studies	Competition from other universities in Kazakhstan, the CIS and online platforms	Incomplete compliance of academic conditions with students' expectations	Strategic	A5	3
19	Chairman of the Management Board, Rector	Ensuring effective management	Risk of non-compliance with internal regulations and labor discipline of teaching staff and employees	Competition from other universities in Kazakhstan, the CIS and online platforms	Reduced level of awareness of the teaching staff about internal regulations, as well as lack of time management skills on the part of the teaching staff and employees	Operational	O4	3
20	Vice-rector for SI	Consumer focus (employers, students, society)	Risk of insufficient centralized management of innovative projects	Social status of faculty, salary levels, support programs for HIPO employees	Inadequacy of centralized management of innovative projects	Strategic	S6	3
21	Vice-rector for AA	Consumer focus (employers, students, society)	Risk of a decrease in the number of students in additional education programs	Competition from other universities in Kazakhstan, the CIS and online platforms	Increasing tuition fees. Dumping prices for courses from competitors. Low solvency of the population. Competition in the field of providing informal educational services	Academic	A6	3
22	Vice-rector for SD&D	Ensuring effective management	Risk of violation of qualification requirements	State regulation of the higher education system (MHE RK, government acts, Presidential Decrees, resolutions)	Insufficient provision of material assets that comply with sanitary rules and regulations approved by the authorized body in the field of health and fire safety	Operational	O5	2,5
23	Vice-rector for SEW	Ensuring effective management	Risk of administrative, corruption and criminal violations by students and employees	Licensing and accreditation policy: institutional and specialized accreditation; requirements for academic	Low level of anti-corruption and legal culture among students and employees	Legal	L1	2,5

No	Distribution of risks among Board Members	Strategic goal	Risk name	Macroenvironment factor	Risk factor	Risk type	Risk code	Risk level
				integrity and quality management				
24	Vice-rector for AA	Highly qualified human resources	Risk of decreased employee motivation due to discrepancy in salary expectations	Anti-corruption culture	Absence of growth in the university's income compared to the previous financial period	Financial	F5	2
25	Vice-rector for SI	Increasing the financial and economic stability and development of the material and technical base of the university	Risk of decreased profitability from the university's research activities	Growing importance of academic and scientific ethics	Absence of winning applications for grant and program-targeted funding, contracts with industrial enterprises for research and other work	Financial	F6	2
26	Vice-rector for SEW	Consumer focus (employers, students, society)	Low motivation of students to participate in scientific, educational, creative, sports and other events	Social status of teachers, salary levels, support programs for HIPO employees	Risk of a decrease in the number of competitive students (awarded at a level not lower than TOP-3) and/or having selling developments	Operational	O6	2
27	Vice-rector for AA	Ensuring effective management	Risk of violation of the requirements of the rules for the appointment, payment and amount of state scholarships for students	Social status of teachers, salary levels, support programs for HIPO employees	Timely posting of final grades to students by teachers in the electronic journal	Legal	L2	2
28	Vice-rector for AA	Increasing the financial and economic stability and development of the material and technical base of the university	Risk of decreased productivity of the educational process	Social status of teachers, salary levels, support programs for HIPO employees	Decrease in the university's income, increase in the staff of academic structures	Financial	F7	1,5
29	Vice-rector for AA	Highly qualified human resources	Risk of a decrease in the number of recognized teaching professionals	Social status of teachers, salary levels, support programs for HIPO employees	Low motivation to participate in industry competitions, scientific research and acceleration programs	Strategic	S7	1,5
30	Vice-rector for SI	Highly qualified human resources	Risk of a decrease in the number of potential RSSTA with security documents	Institutional capacity to generate scientific output (citation indices, publications in Scopus/WoS)	Low quality and/or lack of significant results of scientific and scientific-technical activities	Academic	A7	1,5

No	Distribution of risks among Board Members	Strategic goal	Risk name	Macroenvironment factor	Risk factor	Risk type	Risk code	Risk level
31	Vice-rector for AA	Consumer focus (employers, students, society)	Risk of a decrease in the average salary of graduates	Accelerated technological transformation of Industry 4.0 — requirements for digital and engineering competencies	Incomplete compliance of graduates' competencies with employers' expectations	Strategic	S8	1,5
32	Vice-rector for SD&D	Ensuring effective management	Risk of not achieving the appropriate level of digital maturity according to the methodology of the Ministry of Higher Education of the Republic of Kazakhstan	Digitalization of the educational process: LMS, AI in learning, AR/VR technologies	Lagging behind the university infrastructure in terms of IT development	Strategic	S9	1,5
33	Vice-rector for SEW	Increasing the financial and economic stability and development of the material and technical base of the university	Risk of a decrease in income from fundraising and social and educational activities	The influence of media, digital platforms and social networks on the perception of the university brand	Passivity of stakeholders in implementing socially significant projects for the university	Financial	F8	1
34	Vice-rector for AA	Ensuring effective management	Risk of non-compliance with the requirements for the annual renewal of the educational literature fund in terms of disciplines of educational programs	Value shifts in generations Z and Alpha: expectations of flexibility, career trajectory, social contribution	Absence of requests for the purchase of literature on educational programs from departments	Academic	A8	1

Appendix 4 Company's tolerance to the key risks

Company's tolerance to the key risks

The Company stated the maximum value of the key risks: – 10 (according to the Risk Map)

No	Risk name	Risk code	Risk factor	Risk level	Tolerance to the risk	Strategic goal	KPI of the Board Member	Distribution of risks among Board Members
1	Risk of decreasing the University's income	F1	Decreasing the contingent	5	7,5	Increasing financial and economic stability and developing the material and technical base of the university	Increase the University income from 10,531,899 in 2024 to 11,923,946 in 2029. [KPI of Rector]	Chairman of the Board, Rector
2	Risk of decreasing the quality of practical skills of students	A1	Decreasing the effectiveness of research and business contract activities	5	7,5	Customer focus (employers, students, society)	Increase ASBP from 196 thousand tenge. in 2024 up to 343 thousand tenge. in 2029 [KPI of Rector and Vice-Rector for AA]	Vice-rector for AA
3	Risk of non-compliance with information security requirements	O1	Weak partnerships with enterprises	5	7,5	Ensuring effective management	Increase the level of digital maturity from 1.5 in 2024 to 3 by 2029 [KPI of Vice-Rector for SD&D]	Vice-rector for SD&D
4	Risk of providing false information to external information systems and databases	O2	Imperfection of the information security system, failure to comply with requirements for ensuring information security; loss or availability of documents intended for official use	5	7,5	Ensuring effective management	Increase the level of digital maturity from 1.5 in 2024 to 3 by 2029 [KPI of Vice-Rector for SD&D]	Vice-rector for SD&D
5	Risk of decreasing the quality of the teaching staff	S1	Failure to fill out information in the university's LMS	4,5	6	Highly qualified human resources	Ensure the development of 50 RSSTA of TRL 3-4 level (Number of articles in Web of Science (Clarivate Analytics) and Scopus (Elsevier) journals of Q1-2 level (up to 80 by 2029) [KPI of Vice-Rector for SI]	Vice-rector for SI
6	Risk of decreasing the orientation of scientific research to the needs of production and business	A2	Absence of continuity of scientific schools, reduced quality of support for young scientists, including upon defense	4,5	6	Customer focus (employers, students, society)	Ensure the development of at least 50 potential RSSTA with EDW of TRL 5-6 level (from 30 in 2024 to 80 by 2029) [KPI of Vice-Rector for SI]	Vice-rector for SI
7	Risk of decreasing international collaborations and publication activity of	A3	Weak partnerships with foreign universities	4,5	6	Ensuring effective management	Ensure internationalization of the faculty and staff of the university through academic mobility, internships,	Vice-rector for SD&D

No	Risk name	Risk code	Risk factor	Risk level	Tolerance to the risk	Strategic goal	KPI of the Board Member	Distribution of risks among Board Members
	the university's teaching staff						involvement of foreign experts, language courses from 50 in 2024 to 175 people by 2029 [KPI of the Vice-Rector for SD&D]	
8	Risk of inconsistency of employees' digital competencies with the requirements of the times	O3	Absence of available resources for training	4,5	6	Highly qualified human resources	Increase the level of digital maturity from 1.5 in 2024 to 3 by 2029 [KPI of the Vice-Rector for SD&D]	Vice-rector for SD&D
9	Risk of decreasing the quality of teaching	A4	Changes in the composition of the teaching staff due to various reasons (including staffing with people who do not have teaching experience / certificates of advanced training in the field of pedagogy)	4	6	Customer focus (employers, students, society)	Increase the ASBP from 196 thousand tenge in 2024 to 343 thousand tenge in 2029. [KPI of the Rector and Vice-Rector for AB]	Vice-rector for AA
10	Risk of decreasing the employees' productivity	F2	Decrease in university income	4	6	Improving the financial and economic stability and developing the material and technical base of the university	Increase labor productivity of workers from 8,200 thousand tenge/person in 2024 to 12,200 thousand tenge/*person by 2029 [KPI of the Rector]	Chairman of the Board, Rector
11	Risk of obsolescence of the material and technical base and its inconsistency with conducting research focused on the needs of modern industries	F3	Reducing the amount of financial resources and sponsorship assistance to departments from enterprises	4	6	Customer focus (employers, students, society)	Increase the added value of KTU science (income from science-intensive projects of scientists) from 300 million tons in 2024 to more than 600 million tons by 2029 [KPI of the Vice-Rector of the Research Institute]	Vice-rector for SI
12	Risk of decreased involvement of students in social and educational activities	S2	Forced involvement of students in social and educational activities (for quantity)	4	5	Customer focus (employers, students, society)	Ensure the coverage of students in club and circle activities from 55% to 80% by 2029 [KPI of the Vice-Rector for SEW]	Vice-rector for SEW
13	Risk of non-compliance of the internal quality assurance system with international standards	S3	Absence of advanced training programs in specialized areas for employees of departments	4	5	Highly qualified human resources	Ensure strengthening of positions in the international QS ranking to 651 + by 2029 [KPI of the Rector and Vice-Rector for SD&D]	Vice-rector for SD&D
14	Risk of lack of growth of additional income of the teaching staff from various types of academic activities	F4	Low motivation of the teaching staff to participate in advanced training programs, language	3	4	Highly qualified human resources	Increase the income of the teaching staff (COR, advanced training, LPV, language courses, IELTS, scholarships)	Vice-rector for AA

No	Risk name	Risk code	Risk factor	Risk level	Tolerance to the risk	Strategic goal	KPI of the Board Member	Distribution of risks among Board Members
			courses, development of digital educational resources)				to 10,500 thousand tenge/person by 2029. [KPI of the Vice-Rector of AV]	
15	Risk of decreasing the number of selling RSSTA of TRL level 7-9	A4	Low quality and / or lack of significant results of scientific and scientific-technical activities that have potential for commercialization	3	4,5	Highly qualified human resources	Ensure the development of 15 selling R&D centers of TRL 7-9 level (scopes through OIS – from 2 in 2024 to 30 by 2029) [KPI of Vice-Rector for SI]	Vice-rector for SI
16	Risk of decrease in positions in the international QS ranking	S4	Change in the QS ranking methodology	3	4,5	Ensuring effective management	Ensure strengthening of positions in the international QS ranking to 651 + by 2029. [KPI of the Rector and Vice-Rector for SD&D]	Vice-rector for SD&D
17	Risk of decrease in positions in the national institutional ranking among technical universities	S5	Weakening of positions compared to competitive universities	3	4,5	Ensuring effective management	Ensure strengthening of positions in the national institutional ranking among technical universities from 5th in 2024 to 3rd place in 2029. [KPI of the Vice-Rector for SD&D]	Vice-rector for SD&D
18	Risk of decrease in the contingent of graduation in educational programs of TVE, bachelor's, master's and doctoral studies	A5	Incomplete compliance of academic conditions with the expectations of students	3	4,5	Customer focus (employers, students, society)	Ensure a stable contingent of graduates in the educational programs of TVE, bachelor's, master's and doctoral programs (1.5% of the economically active population) [KPI of the Vice-Rector for SEW]	Vice-rector for SEW
19	Risk of non-compliance with internal regulations and labor discipline of the teaching staff and employees	O4	Reduced level of awareness of the teaching staff about the internal regulations, as well as lack of time management skills on the part of the teaching staff and employees	3	4,5	Ensuring effective management	Maintain "at zero" administrative corruption and criminal violations of students and employees [KPI of the Rector and Vice-Rector for SEW]	Chairman of the Board, Rector
20	Risk of insufficient centralized management of innovative projects	S6	Inadequacy of centralized management of innovative projects	3	4,5	Customer focus (employers, students, society)	Ensure the development of at least 50 potential RSSTA with EDW level TRL 5-6 (from 30 in 2024 to 80 by 2029) [KPI of Vice-Rector for SI]	Vice-rector for SI
21	Risk of a decrease in the number of students in additional education programs	A6	Increasing the tuition fees. Dumping prices for courses from competitors. Low solvency of the population. Competition in the field of providing informal educational services	3	4,5	Customer focus (employers, students, society)	Increase the income of the teaching staff (COR, advanced training, language courses, IELTS, personal scholarships) from 3,200 thousand tenge/person in 2024 to 6,000 thousand tenge/person. by 2026 [KPI of Vice-Rector for AA]	Vice-rector for AA

No	Risk name	Risk code	Risk factor	Risk level	Tolerance to the risk	Strategic goal	KPI of the Board Member	Distribution of risks among Board Members
22	Risk of violation of qualification requirements	O5	Insufficient provision of material assets that comply with sanitary rules and regulations approved by the authorized body in the field of health and fire safety	2,5	2,5	Ensuring effective management	Ensure successful completion of external quality assessment procedures (share of accredited educational institutions operating for more than 4 years, 100%) [KPI of the Vice-Rector for SD&D]	Vice-rector for SD&D
23	Risk of administrative, corrupt and criminal violations by students and employees	L1	Low level of anti-corruption and legal culture among students and employees	2,5	2,5	Ensuring effective management	Maintain “at zero” administrative, corruption and criminal violations of students and employees [KPI of the Rector and Vice-Rector for SEW]	Vice-rector for SEW
24	Risk of decreasing employee motivation due to discrepancy in salary expectations	F5	Absence of growth in the university's income compared to the previous financial period	2	3	Highly qualified human resources	Increase motivation (SZP of employees) from 310 thousand tons in 2023 to 403.404 thousand tons in 2026 [KPI of Rector]	Vice-rector for AA