

## APPENDIX A

### Matrix of SWOT analysis

Internal factors	Strengths (S)	Weaknesses (W)
	<p><i>1. Internationalization at the university level</i></p> <p>1.1. Positions in ratings</p> <ul style="list-style-type: none"> <li>– Significant increase in QS rankings during the first 2 years after joining</li> <li>– Rating on RankPro</li> <li>– Rating by webometrics</li> <li>– NAOCO National Ranking is the 1st by Technical Universities</li> <li>– National IAAR Ranking as the 1st by Technical Universities</li> </ul>	<p><i>1. Internationalization at the university level</i></p> <p>1.1 Low interest of teaching staff and scientists in international projects participation;</p> <p>1.2 Low level of membership in international associations of universities;</p> <p>1.3 Insufficiently high level of digitalization of processes in the university;</p> <p>1.4 The library stock is predominantly in Russian;</p> <p>1.5 Insufficient financing of international projects and programs at the expense of budgetary funds and the university's own funds;</p> <p>1.6 Low level of participation in international educational exhibitions and projects.</p>
	<p><i>2. Administrative management, management structure, work with administrative staff</i></p> <p>2.1 Implementation of state policy in the management of the organization of higher education in accordance with the recommendations of the authorized body in the field of education.</p> <p>2.2 High level of management of the educational process.</p> <p>2.3 Development of the incentive system and development of the personnel reserve.</p>	<p><i>2. Administrative management, management structure, work with administrative staff</i></p> <p>2.1 Lack of transparent management processes;</p> <p>2.2 Lack of interconnection between intra-university processes.</p> <p>2.3 Low level of time management.</p> <p>2.4 Partial compliance of the qualification requirements for administrative personnel with accepted international standards;</p> <p>2.5 Insufficient study of internationalization issues in the internal strategic documents of the university.</p> <p>2.6 Low level of development of digital competencies of administrative personnel.</p> <p>2.7 Insufficient involvement of teaching staff and students in corporate governance processes.</p>
	<p><i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i></p> <p>3.1 Orientation of educational programs to Industry 4.0</p> <p>3.2 High employment rate of graduates 94.9%</p> <p>3.3 Student-centered academic policy.</p>	<p><i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i></p> <p>3.1 Low number of modules taught in English</p> <p>3.2 Non-compliance with the requirements for opening doctoral programs in some of the implemented areas of training.</p> <p>3.3 Orientation to Russian standards when designing the content of educational programs.</p> <p>3.4 Low compliance of electronic content with international standards.</p>

	<p><i>4. Teaching staff</i></p> <p>4.1 84% of teachers have postgraduate qualifications.</p> <p>4.2 Personnel policy of the university.</p> <p>4.3 50% of the teaching staff have a doctorate.</p>	<p><i>4. Teaching staff</i></p> <p>4.1 Low level of external mobility of teaching staff and scientists (incoming and outgoing).</p> <p>4.2 Lack of staff speaking three languages.</p> <p>4.3 Insufficient development of management skills among scientists and researchers.</p> <p>4.4 Lack of favorable prospects for scientific personnel.</p> <p>4.5 Lack of appropriate postgraduate support to improve the qualifications of personnel.</p> <p>4.6 Fixed attitudes of thinking.</p>
	<p><i>5. Student mobility</i></p> <p>5.1 Academic mobility programs for students, including the positive dynamics of the level of outgoing mobility among students.</p>	<p><i>5. Student mobility</i></p> <p>5.1 Low level of mobility of incoming students.</p> <p>5.2 The flow of outgoing academic mobility is mainly directed towards the Russian-speaking countries.</p> <p>5.3 Regional mobility (from the nearest neighboring countries) constitutes the bulk of the applicants.</p>
	<p><i>6. Cooperation and partnership</i></p> <p>6.1 Involvement of representatives of large international companies in the educational process.</p> <p>6.2 Industry partnerships.</p> <p>Tripartite agreements - University-Employer-Student.</p> <p>6.3 Involvement of KazMIRD and other institutes, teaching staff of the university to conduct consultations and examinations in specialized subject areas.</p> <p>6.4 Operating centers of the international level.</p>	<p><i>6. Cooperation and partnership</i></p> <p>6.1 Most of the cooperation agreements are not implemented, remaining to act only on paper.</p> <p>6.2 Low level of English proficiency among teaching staff and students.</p> <p>6.3 Lack of international collaborations.</p> <p>6.4 Weak integration of education, science and business.</p>
	<p><i>7. Science and innovation</i></p> <p>7.1 Implementation of research results into production (development of prototypes).</p> <p>7.2 Development of the material and technical base for research activities.</p> <p>7.3 Cooperation with scientists from neighboring countries.</p> <p>7.4 Publications in journals with a high Impact factor</p> <p>7.5 Focus on the integration of IT with various industries.</p>	<p><i>7. Science and innovation</i></p> <p>7.1 Orientation of educational programs, scientific research to the Russian Federation.</p> <p>7.2 Lack of direct international funding for research.</p> <p>7.3 Insufficient and low level of international publications in English.</p> <p>7.4 Lack of entrepreneurial and research skills.</p> <p>7.5 Insufficient application of research results or applied research in the field of economic development.</p> <p>7.6 Low R&amp;D indicators</p> <p>7.7 Weak development of commercialization of innovations.</p> <p>7.8 Lack of infrastructure to support the introduction of new technologies in teaching, research and management.</p> <p>7.9 Research stagnation infrastructure.</p> <p>7.10 Lack of scientific research in conjunction with leading foreign universities.</p>
	<b>Opportunities(O)</b>	<b>Threats(T)</b>

<b>External factors</b>	<p><i>1. Internationalization at the university level</i></p> <p>1.1 Leading institution for technical disciplines in Central Asia</p> <p>1.2 Improving the position in the QS rankings</p> <p>1.3 Development of an alumni association to receive help and support from them</p>	<p><i>1. Internationalization at the university level</i></p> <p>1.1 Kazakhstan's restrained position in the international arena contributes to poor conversion of applications for funding research projects and a lack of international partners.</p> <p>1.2. Growing ranking of QS partners</p> <p>1.3 Decrease in position in world rankings</p> <p>1.4 Regulated model of budgetary financing.</p> <p>1.5 Lack of a systematic approach to internationalization in the current strategic documents of the Republic;</p> <p>1.6 Youth emigration to foreign universities</p> <p>1.7 Transfer of the education system of the Republic of Kazakhstan to a distance format in connection with the coronavirus pandemic.</p> <p>1.8 Lack of funds and resources for student grants, research and staff development.</p>
	<p><i>2. Administrative management, management structure, work with administrative staff</i></p> <p>2.1 Annual advanced training of administrative personnel in the development of managerial and communication skills in republican and foreign educational organizations</p>	<p><i>2. Administrative management, management structure, work with administrative staff</i></p> <p>2.1 Imperfection of digital systems for the exchange and transmission of information</p> <p>2.3 Non-compliance of established procedures with business processes.</p> <p>2.4 Lack of transparency in administrative processes / procedures.</p> <p>2.5 Lack of a well-functioning system for providing jobs or practical experience for graduates.</p> <p>2.6 Lack of international staff.</p> <p>2.7 Lack of staff motivation and involvement;</p> <p>2.8 Lack of a system of advanced training of administrative personnel due to the appropriate postgraduate support;</p> <p>2.9 Fixed mindsets</p> <p>2.10 Overestimation of targets / performance indicators and, as a result, their non-fulfillment.</p> <p>2.11 Failure to accept new working methods.</p> <p>2.12 Failure to develop youth policy taking into account international experience.</p> <p>2.13 Lack of clear regulations for information flows along the vertical and horizontal management, which leads to a decrease in the efficiency of information dissemination.</p>

	<p><i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i></p> <p>3.1 Joint implementation of programs (academic and industrial);</p> <p>3.2 Cooperation for joint / double degrees in the implementation of Double Degree programs.</p> <p>3.3 Development of online modules and programs, including MOOC;</p> <p>3.4 Development of educational programs in accordance with the requirements of employers.</p> <p>3.5 Development of educational programs focused on obtaining work qualifications;</p> <p>3.6 Development of working curricula for the VET system.</p> <p>3.7 Development of project-oriented programs.</p> <p>3.8 Development of new ways to assess learning outcomes;</p> <p>3.9 Implementation of research results in the educational process.</p> <p>3.10 Transition to competence-based educational programs.</p> <p>3.11 Development of standards and quality management systems for programs in accordance with international practice.</p>	<p><i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i></p> <p>3.1 Weak analytics for forecasting the need for specialists.</p> <p>3.2 Insufficient level of implementation and use of the anti-plagiarism system</p> <p>3.4 Lack of clear coordination on the part of the republican educational and methodological councils for educational programs aimed at improving the quality of educational programs.</p> <p>3.5 Decrease in the level of training of applicants.</p> <p>3.6 Lack of compulsory modules taught in English as part of the educational program.</p> <p>3.7 Development of new and innovative educational programs without taking into account international practice.</p> <p>3.8 Duration of the process of obtaining permission from the Authorized body in the field of education for the implementation of new and / or innovative educational programs.</p> <p>3.9 Failure to accept modern and innovative teaching methods.</p> <p>3.10 Imperfection of support systems for digital learning systems.</p>
	<p><i>4. Teaching staff</i></p> <p>4.1 Increasing the number of doctoral staff;</p> <p>4.2 Increasing the number of trilingual staff</p>	<p><i>Teaching staff</i></p> <p>4.1 Lack of succession planning</p> <p>4.2 Emigration of scientific personnel for the realization of their scientific potential •</p> <p>4.3 Lack of a flexible system for organizing foreign trips of teaching staff and scientists</p>
	<p><i>5. Student mobility</i></p> <p>5.1 Development of new directions of academic mobility, including with non-CIS countries.</p> <p>5.2 Increasing the prestige and ranking of the university at the international level.</p> <p>5.3. Expansion of the “Education Hub in Central Asia” trend.</p>	<p><i>5. Student mobility</i></p> <p>5.1 Reduction in funding for outgoing academic mobility</p>
	<p><i>6. Cooperation and partnership</i></p> <p>6.1 Cooperation in the formation of a positive image of the university in the international market of educational services.</p> <p>6.2 Cooperation with Kazakh and foreign partner universities in library resources.</p> <p>6.2 Improving the work of the Career Development Center.</p> <p>6.3 Creation of a business and innovation hub.</p> <p>6.4 Increasing income from non-grant programs through student recruitment.</p>	<p><i>6. Cooperation and partnership</i></p> <p>6.1 Formalization of tripartite agreements</p> <p>6.2 Reducing the motivation of foreign partners to cooperate</p>

	<p><i>7. Science and innovation</i></p> <p>7.1 Development of joint research with foreign partners;</p> <p>7.2 Development of research work in priority areas Industry 4.0.</p> <p>7.3 Establishing cooperation with foreign companies to research methods of mining.</p> <p>7.4 Presentation of research results at the international level.</p> <p>7.5 Commercialization of research results.</p>	<p><i>7. Science and innovation</i></p> <p>7.1 Low citation rate of scientific publications</p> <p>7.2 Lack of awareness of the possibility of applying for international funding;</p> <p>7.3 Low percentage of close interaction with industry;</p> <p>7.4 Low percentage of R&amp;D commissioned by enterprises and commercialization of the results obtained.</p>
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## APPENDIX B

### Decision Matrix 1: S-O - Power Line

S-O: Strengths + Opportunities		
Strengths	Opportunities	Decisions
<i>1. Internationalization at the university level</i>		
1.1. Positions in ratings – Large increase in QS rankings during the first 2 years after joining – Rating on RankPro – Rating by webometrics – NAOCO National Ranking # 1 by Technical Universities – National IAAR Ranking as 1st by Technical Universities	1.1 Leading institution for technical disciplines in Central Asia. 1.2 Improving the position in the QS rankings. 1.3 Development of an alumni association to receive help and support from them.	1. Improving the quality of technical education in accordance with international standards. 2. Creation of a specialized service for communication and interaction with graduates, including those living abroad. 3. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects.
<i>2. Administrative management, management structure, work with administrative staff</i>		
2.1 Implementation of state policy in the management of the organization of higher education in accordance with the recommendations of the authorized body in the field of education. 2.2 High level of management of the educational process. 2.3 Development of the incentive system and development of the personnel reserve.	2.1 Annual advanced training of administrative personnel in the development of managerial and communication skills in republican and foreign educational organizations.	1. Development of intra-university standards for administrative processes in the field of internationalization. 2. Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of internationalization of the university.
<i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i>		
3.1 Orientation of educational programs to Industry 4.0; 3.2 High employment rate of graduates 94.9%; 3.3 Student-centered academic policy.	3.1 Joint implementation of programs (academic and industrial); 3.2 Cooperation for joint / double diplomas in the implementation of Double Degree programs; 3.3 Development of online modules and programs, including MOOC; 3.4 Development of educational programs in accordance with the requirements of employers; 3.5 Development of educational programs focused on obtaining work qualifications; 3.6 Development of working curricula for the VET system; 3.7 Development of project-oriented programs; 3.8 Development of new ways to assess learning outcomes; 3.9 Implementation of research results in the educational process; 3.10 Transition to competence-based educational programs; 3.11 Development of standards and quality management systems for programs in accordance with international practice.	1. Identification of new components for implementation in curricula, taking into account international academic requirements for students. 2. Creation of a base of key competencies of graduates that meet international standards. 3. Involvement of foreign scientists for consultations on the development of curricula in the framework of partnership agreements. 4. Involvement of regional and foreign employers in the definition of key competencies of graduates. 5. Ensuring the continuity of educational programs. 6. Application of research results in the development of educational programs.

<i>4. Teaching staff</i>		
<p>4.1 84% of teachers have postgraduate qualifications.</p> <p>4.2 Personnel policy of the university.</p> <p>4.3 50% of the teaching staff have a doctorate.</p>	<p>4.1 Increasing the number of doctoral staff;</p> <p>4.2 Increasing the number of trilingual staff.</p>	<p>1. Identification of priority areas for advanced training of the teaching staff, including the development of language competencies and intercultural communications.</p> <p>2. Encouraging young scientists to conduct research and obtain doctoral qualifications.</p> <p>3. Providing language support in preparation for entrance exams for master's and doctoral studies.</p> <p>4. Allocation of budgetary funds for language support of teachers for conducting classes in three languages.</p> <p>5. Search for new sources of funding for the organization of mobility and training of teaching staff.</p>
<i>5. Student mobility</i>		
<p>5.1 Academic mobility programs for students, including the positive dynamics of the level of outgoing mobility among students.</p>	<p>5.1 Development of new directions of academic mobility, including with non-CIS countries</p> <p>5.2 Increasing the prestige and ranking of the university at the international level.</p> <p>5.3. Expansion of the “Education Hub in Central Asia” trend.</p>	<p>1. Conclusion of partnership agreements with universities in the far abroad.</p> <p>2. Active involvement of existing foreign partners in academic mobility programs.</p> <p>3. Search for new programs for the organization of academic mobility of students, funded by extra-budgetary funds and funds of the university.</p>
<i>6. Cooperation and partnership</i>		
<p>6.1 Involvement of representatives of large international companies in the educational process.</p> <p>6.2 Industry partnerships, Tripartite agreements - University-Employer-Student.</p> <p>6.3 Involvement of KazMIRD and other institutes, teaching staff of the university to conduct consultations and examinations in specialized subject areas.</p> <p>6.4 Operating centers of the international level.</p> <p>6.5 Integration of education and production.</p> <p>6.6 Organization of entrepreneurial courses and support for start-ups among students and teaching staff.</p>	<p>6.1 Cooperation in the formation of a positive image of the university in the international market of educational services.</p> <p>6.2 Cooperation with Kazakh and foreign partner universities in library resources.</p> <p>6.2 Improving the work of the Career Development Center.</p> <p>6.3 Creation of a business and innovation hub.</p> <p>6.4 Increase income from non-grant programs through student recruitment.</p>	<p>6.1 Cooperation in the formation of a positive image of the university in the international market of educational services.</p> <p>6.2 Cooperation with Kazakh and foreign partner universities in library resources.</p> <p>6.2 Improving the work of the Career Development Center.</p> <p>6.3 Creation of a business and innovation hub.</p> <p>6.4 Increase income from non-grant programs through student recruitment, as well as the provision of specialized services on the basis of existing institutions of the university.</p> <p>5. Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups.</p>
<i>7. Science and innovation</i>		

<p>7.1 Implementation of research results into production (development of prototypes).</p> <p>7.2 Development of the material and technical base for research activities.</p> <p>7.3 Cooperation with scientists from neighboring countries.</p> <p>7.4 Publications in journals with a high Impact factor.</p> <p>7.5 Focus on the integration of IT with various industries.</p>	<p>7.1 Development of joint research with foreign partners;</p> <p>7.2 Development of research work in priority areas Industry 4.0.</p> <p>7.3 Establishing cooperation with foreign companies to research methods of mining.</p> <p>7.4 Presentation of research results at the international level.</p> <p>7.5 Commercialization of research results.</p>	<p>1. Improving the quality of preparation of articles in English for the publication of research results for presentation to the international scientific community.</p> <p>2. Development of an open dialogue platform to attract foreign partners to conduct research and commercialize the results.</p>
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## APPENDIX C

### Decision Matrix 1: W-O - Improvement Line

<b>W-O: Weak points+ Opportunity</b>		
<b>Weak points</b>	<b>Opportunity</b>	<b>Decision</b>
<i>1. Internationalization at the university level</i>		
1.1 Low interest of teaching staff and scientists in participation in international projects. 1.2 Low level of membership in international associations of universities; 1.3 Insufficiently high level of digitalization of processes in the university. 1.4 The library stock is predominantly in Russian. 1.5 Insufficient financing of international projects and programs at the expense of budgetary funds and the university's own funds. 1.6 Low level of participation in international educational exhibitions and projects.	1.1 Leading institution for technical disciplines in Central Asia. 1.2 Improving the position in the QS rankings. 1.3 Development of an alumni association to receive help and support from them.	1. Stimulating teaching staff and scientists to participate in international projects. 2. Increasing the share of membership in international associations. 3. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects. 4. Providing the university with English-language electronic library resources through cooperation with foreign partners. 5. Development of cooperation with foreign publications and electronic resources. 6. Search for new programs and competitions for financing collaboration initiatives. 7. Increase in participation in international exhibitions. 8. Creation of a marketing service.
<i>2. Administrative management, management structure, work with administrative staff</i>		
2.1 Lack of transparent management processes; 2.2 Lack of interconnection between intra-university processes. 2.3 Low level of time management. 2.4 Partial compliance of the qualification requirements for administrative personnel with accepted international standards; 2.5 Insufficient study of internationalization issues in the internal strategic documents of the university. 2.6 Low level of development of digital competencies of administrative personnel. 2.7 Insufficient involvement of teaching staff and students in corporate governance processes.	2.1 Annual advanced training of administrative personnel in the development of managerial and communication skills in republican and foreign educational organizations.	1. Development of intra-university standards for administrative processes in the field of internationalization. 2. Conducting trainings, round tables, refresher courses with the participation of foreign specialists for administrative workers involved in managing the process of internationalization of the university. 3. Compliance and development of algorithms for administrative management processes in order to ensure their transparency and interconnection. 4. Development of corporate management standards.
<i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i>		
3.1 Low number of modules taught in English. 3.2 Non-compliance with the requirements for opening doctoral programs in some implemented areas of training. 3.3 Orientation to Russian standards when designing the content of educational programs.	3.1 Joint implementation of programs (academic and industrial); 3.2 Cooperation for joint / double diplomas in the implementation of Double Degree programs; 3.3 Development of online modules and programs, including MOOC;	1. Definition of new components of implementation in curricula, taking into account international academic requirements for students. 2. Identification of priority areas for advanced training of the teaching staff, including the development of language and

3.4 Low compliance of electronic content with international standards.	<p>3.4 Development of educational programs in accordance with the requirements of employers</p> <p>3.5 Development of educational programs focused on obtaining work qualifications;</p> <p>3.6 Development of working curricula for the VET system.</p> <p>3.7 Development of project-oriented programs.</p> <p>3.8 Development of new ways to assess learning outcomes.</p> <p>3.9 Implementation of research results in the educational process.</p> <p>3.10 Transition to competence-based educational programs.</p> <p>3.11 Development of standards and quality management systems for programs in accordance with international practice.</p>	<p>digital competencies, intercultural communications.</p> <p>3. Allocation of budgetary funds for language support of teachers for conducting classes in three languages.</p> <p>4. Involvement of foreign scientists for consultations on the development of curricula in the framework of partnership agreements.</p> <p>5. Conclusion of partnership agreements with foreign universities.</p> <p>6. Application of research results in the development of educational programs.</p>
<i>4. Teaching staff</i>		
<p>4.1 Low level of external mobility of teaching staff and scientists (incoming and outgoing).</p> <p>4.2 Lack of staff speaking three languages.</p> <p>4.3 Insufficient development of management skills among scientists and researchers.</p> <p>4.4 Lack of favorable prospects for scientific personnel.</p> <p>4.5 Lack of appropriate postgraduate support to improve the qualifications of personnel.</p> <p>4.6 Fixed attitudes of thinking.</p>	<p>4.1 Increasing the number of doctoral staff;</p> <p>4.2 Increasing the number of trilingual staff.</p>	<p>1. Search for new programs and grants for the mobility of teaching staff</p> <p>2. Search for new foreign partners to motivate scientific personnel.</p> <p>3. Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists.</p> <p>4. Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications.</p> <p>5. Application of international practice of creating a support group for postgraduate support and undergraduate training programs.</p>
<i>5. Student mobility</i>		
<p>5.1 Low level of mobility of incoming students.</p> <p>5.2 The flow of outgoing academic mobility is mainly directed towards the Russian-speaking countries.</p> <p>5.2 Regional mobility (from the nearest neighboring countries) constitutes the bulk of the applicants.</p>	<p>5.1 Development of new directions of academic mobility, including with non-CIS countries</p> <p>5.2 Increasing the prestige and ranking of the university at the international level.</p> <p>5.3. Expansion of the "Education Hub in Central Asia" trend.</p>	<p>1. Conclusion of partnership agreements with universities in the far abroad.</p> <p>2. Active involvement of existing foreign partners in academic mobility programs.</p> <p>3. Participation in exchange programs like Erasmus +, DAAD and Fullbright.</p>
<i>6. Cooperation and partnership</i>		
<p>6.1 Most of the cooperation agreements are not implemented, remaining to act only on paper.</p> <p>6.2 Low level of English proficiency among teaching staff and students.</p> <p>6.3 Lack of international collaborations.</p>	<p>6.1 Cooperation in the formation of a positive image of the university in the international market of educational services.</p> <p>6.2 Cooperation with Kazakh and foreign partner universities in library resources.</p>	<p>1. Resumption of work on previously concluded contracts.</p> <p>2. Creation of an action plan with a partner university before concluding a new contract.</p> <p>3. Identification of priority areas for advanced training of the teaching staff, including the</p>

6.4 Weak integration of education, science and business.	6.2 Improving the work of the Career Development Center. 6.3 Creation of a business and innovation hub. 6.4 Increase income from non-grant programs through student recruitment.	development of language and digital competencies, intercultural communications. 4. Creation of a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators.
<i>7. Science and innovation</i>		
7.1 Orientation of educational programs, scientific research to the Russian Federation. 7.2 Lack of direct international funding for research. 7.3 Insufficient and low level of international publications in English. 7.4 Lack of entrepreneurial and research skills. 7.5 Insufficient application of research results or applied research in the field of economic development. 7.6 Low R&D indicators 7.7 Weak development of commercialization of innovations. 7.8 Lack of infrastructure to support the introduction of new technologies in teaching, research and management. 7.9 Research stagnation infrastructure. 7.10 Lack of scientific research in conjunction with leading foreign universities.	7.1 Development of joint research with foreign partners; 7.2 Development of research work in priority areas Industry 4.0. 7.3 Establishing cooperation with foreign companies to research methods of mining. 7.4 Presentation of research results at the international level. 7.5 Commercialization of research results.	1. Conclusion of partnership agreements with universities from far abroad. 2. Increasing the participation of teaching staff and scientists at international seminars, conferences, forums. 3. Translation of the accumulated materials into English for the purpose of publishing them in international journals. 4. Establishment and strengthening of communication with regional and republican industries. 5. Implementation of research results or applied research in the real sector of the economy. 6. Improvement of the library system in order to increase the availability of available resources for students. 7. Creation of a network library with foreign partners. 8. Creation of infrastructure to support the introduction of new technologies in teaching, research and management. 9. Improving the quality of preparation of articles in English for the publication of research results for submission to the international scientific community. 10. Development of an open dialogue platform to attract foreign partners to conduct research and commercialize the results.

## APPENDIX D

### Decision Matrix 1: S-T - Protection Line

S-T: Strong points + Threats		
Strong points	Threats	Decision
<i>1. Internationalization at the university level</i>		
<p>1.1. Positions in ratings</p> <ul style="list-style-type: none"> <li>– Large increase in QS rankings during the first 2 years after joining</li> <li>– Rating on RankPro</li> <li>– Rating by webometrics</li> <li>– NAOCO National Ranking # 1 by Technical Universities</li> <li>– National IAAR Ranking as 1st by Technical Universities</li> </ul>	<p>1.1 Kazakhstan's restrained position in the international arena contributes to poor conversion of applications for funding research projects and a lack of international partners.</p> <p>1.2. Growing ranking of QS partners.</p> <p>1.3 Decrease in position in world rankings.</p> <p>1.4 Regulated model of budgetary financing.</p> <p>1.5 Lack of a systematic approach to internationalization in the current strategic documents of the Republic;</p> <p>1.6 Youth emigration to foreign universities.</p> <p>1.7 Transfer of the education system of the Republic of Kazakhstan to a distance format in connection with the coronavirus pandemic.</p> <p>1.8 Lack of funds and resources for student grants, research and staff development.</p>	<p>1. Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university.</p> <p>2. Search for mechanisms of financing international initiatives except for budgetary funds in order to reduce dependence on republican funding.</p> <p>3. Creation of mechanisms and tools for attracting gifted students.</p> <p>4. Participation in foreign courses to improve the qualifications of teaching staff on the use of DLE.</p> <p>5. Creation of a new own information resource to neutralize threats during training using DLE.</p> <p>6. Search for international funds for financing educational, scientific and sports student initiatives.</p>
<i>2. Administrative management, management structure, work with administrative staff</i>		
<p>2.1 Implementation of state policy in the management of the organization of higher education in accordance with the recommendations of the authorized body in the field of education.</p> <p>2.2 High level of management of the educational process.</p> <p>2.3 Development of the incentive system and development of the personnel reserve.</p>	<p>2.1 Imperfection of digital systems for the exchange and transmission of information</p> <p>2.3 Non-compliance of established procedures with business processes.</p> <p>2.4 Lack of transparency in administrative processes / procedures.</p> <p>2.5 Lack of a well-functioning system for providing jobs or practical experience for graduates.</p> <p>2.6 Lack of international staff.</p> <p>2.7 Lack of staff motivation and involvement;</p> <p>2.8 Lack of a system of advanced training of administrative personnel due to the appropriate postgraduate support;</p> <p>2.9 Fixed mindsets</p> <p>2.10 Overestimation of targets / performance indicators and, as a result, their non-fulfillment.</p> <p>2.11 Failure to accept new working methods.</p> <p>2.12 Failure to develop youth policy taking into account international experience.</p> <p>2.13 Lack of clear regulations for information flows along the vertical and horizontal management, which</p>	<p>1. Development of intra-university standards for administrative processes in the field of internationalization.</p> <p>2. Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of internationalization of the university.</p> <p>3. Application of international practice of creating a support group for postgraduate support and undergraduate training programs.</p> <p>4. Compliance and development of algorithms for administrative management processes in order to ensure their transparency and interconnection.</p> <p>5. Development of corporate management standards.</p> <p>6. Search for new foreign partners to motivate personnel.</p> <p>7. Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists.</p> <p>8. Development of an information system that ensures the implementation of</p>

	leads to a decrease in the efficiency of information dissemination.	internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers.
<i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i>		
3.1 Orientation of educational programs to Industry 4.0. 3.2 High employment rate of graduates 94.9%. 3.3 Student-centered academic policy.	3.1 Weak analytics for forecasting the need for specialists. 3.2 Insufficient level of implementation and use of the anti-plagiarism system. 3.4 Lack of clear coordination on the part of the republican educational and methodological councils for educational programs aimed at improving the quality of educational programs. 3.5 Decrease in the level of training of applicants. 3.6 Lack of compulsory modules taught in English as part of the educational program. 3.7 Development of new and innovative educational programs without taking into account international practice. 3.8 Duration of the process of obtaining permission from the Authorized body in the field of education for the implementation of new and / or innovative educational programs. 3.9 Failure to accept modern and innovative teaching methods. 3.10 Imperfection of support systems for digital learning systems.	1. Definition of new components of implementation in curricula, taking into account international academic requirements for students. 2. Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook 3. Development of mechanisms for interaction of all subjects of the educational process of internationalization through an integrated information learning system. 4. Identification of new components for implementation in curricula, taking into account international academic requirements for students. 5. Creation of a base of key competencies of graduates that meet international standards. 6. Ensuring the continuity of educational programs. 7. Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications. 8. Allocation of budgetary funds for language support of teachers for conducting classes in three languages. 9. Involvement of regional and foreign employers in determining the key competencies of graduates. 10. Creation of infrastructure to support the introduction of new technologies in teaching, research and management.
<i>4. Teaching staff</i>		
4.1 84% of teachers have postgraduate qualifications. 4.2 Personnel policy of the university.	4.1 Lack of succession planning 4.2 Emigration of scientific personnel for the realization of their scientific potential .	1. Development of a methodology for the language training of university staff and students as a condition for the development of

4.3 50% of the teaching staff have a doctorate.	4.3 Lack of a flexible system for organizing foreign trips of teaching staff and scientists.	<p>key methodological competencies for teaching and learning in English</p> <p>2. Encouraging young scientists to conduct research and obtain doctoral qualifications.</p> <p>3. Providing language support in preparation for entrance exams for master's and doctoral studies</p> <p>4. Allocation of budgetary funds for language support of teachers for conducting classes in three languages.</p> <p>5. Participation in foreign courses on professional development of teaching staff on the use of DLE.</p> <p>6. Increasing the participation of teaching staff and scientists at international seminars, conferences, forums.</p> <p>7. Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications.</p> <p>8. Creation of an incentive system for teaching staff and scientists to expand international cooperation and form a network of international collaborators.</p> <p>9. Search for new programs and grants for the mobility of teaching staff.</p>
<i>5. Student mobility</i>		
5.1 Academic mobility programs for students, including the positive dynamics of the level of outgoing mobility among students.	5.1 Reduction of funding for outgoing academic mobility.	<p>1. Attracting and supporting international students.</p> <p>2. Conclusion of partnership agreements with universities from far abroad.</p> <p>3. Active involvement of existing foreign partners in academic mobility programs.</p> <p>4. Search for new programs for the organization of academic mobility of students, financed from extrabudgetary funds and funds of the university.</p> <p>5. Increase the amount of electronic content on the university website in English.</p> <p>6. Opening of the official representative office of the university abroad.</p>
<i>6. Cooperation and partnership</i>		
6.1 Involvement of representatives of large international companies in the educational process. 6.2 Industry partnerships,	6.1 Formal conclusion of tripartite agreements. 6.2 Reducing the motivation of foreign partners to cooperate.	1. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects.

<p>Tripartite agreements - University-Employer-Student.</p> <p>6.3 Involvement of KazMIRD and other institutes, teaching staff of the university to conduct consultations and examinations in specialized subject areas.</p> <p>6.4 Operating centers of the international level.</p>		<p>2. Involvement of regional and foreign employers to determine the key competencies of graduates.</p> <p>3. Conclusion of partnership agreements with foreign universities.</p> <p>4. Opening of the official representative office of the university abroad.</p> <p>5. Search for new areas of cooperation within the educational activities of the university, as well as the provision of specialized services on the basis of existing institutions of the university.</p> <p>6. Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups.</p> <p>7. Establishment and strengthening of communication with regional and republican industries.</p> <p>8. Implementation of research results or applied research in the real sector of the economy.</p>
<i>7. Science and innovation</i>		
<p>7.1 Implementation of research results into production (development of prototypes).</p> <p>7.2 Development of the material and technical base for research activities.</p> <p>7.3 Cooperation with scientists from neighboring countries.</p> <p>7.4 Publications in journals with a high Impact factor.</p> <p>7.5 Focus on the integration of IT with various industries.</p>	<p>1. Low citation rate of scientific publications.</p> <p>7.2 Lack of awareness of the possibility of applying for international funding;</p> <p>7.3 Low percentage of close interaction with industry,</p> <p>7.4 Low percentage of R&amp;D commissioned by enterprises and commercialization of the results obtained.</p>	<p>1. Improving the quality of preparation of articles in English for the publication of research results for presentation to the international scientific community.</p> <p>2. Development of an open dialogue platform to attract foreign partners to conduct research and commercialize the results.</p> <p>3. Translation of the accumulated materials into English for the purpose of their publication in international journals.</p> <p>5. Implementation of research results or applied research in the real sector of the economy.</p>

## APPENDIX E

### Decision Matrix 1: W-T - Warning Line

W-T: Weaknesses + Threats		
Weaknesses	Threats	Decisions
<i>1. Internationalization at the university level</i>		
<p>1.1 Low interest of teaching staff and scientists in participation in international projects.</p> <p>1.2 Low level of membership in international associations of universities;</p> <p>1.3 Insufficiently high level of digitalization of processes in the university.</p> <p>1.4 The library stock is predominantly in Russian.</p> <p>1.5 Insufficient financing of international projects and programs at the expense of budgetary funds and the university's own funds.</p> <p>1.6 Low level of participation in international educational exhibitions and projects.</p>	<p>1.1 Kazakhstan's restrained position in the international arena contributes to poor conversion of applications for funding research projects and a lack of international partners.</p> <p>1.2. Growing ranking of QS partners.</p> <p>1.3 Decrease in position in world rankings.</p> <p>1.4 Regulated model of budgetary financing.</p> <p>1.5 Lack of a systematic approach to internationalization in the current strategic documents of the Republic;</p> <p>1.6 Youth emigration to foreign universities.</p> <p>1.7 Transfer of the education system of the Republic of Kazakhstan to a distance format in connection with the coronavirus pandemic.</p> <p>1.8 Lack of funds and resources for student grants, research and staff development.</p>	<p>1 Improving the quality of technical education in line with international standards.</p> <p>2 Providing the university with English-language electronic library resources through cooperation with foreign partners.</p> <p>3 Definition of new components of implementation in curricula, taking into account international academic requirements for students.</p> <p>4 Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university.</p> <p>5 Search for new programs and competitions for financing collaboration initiatives.</p> <p>6 Development of intra-university standards for administrative processes in the field of internationalization.</p> <p>7 Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers.</p>
<i>2. Administrative management, management structure, work with administrative staff</i>		
<p>2.1 Lack of transparent management processes;</p> <p>2.2 Lack of interconnection between intra-university processes.</p> <p>2.3 Low level of time management.</p> <p>2.4 Partial compliance of the qualification requirements for administrative personnel with accepted international standards;</p> <p>2.5 Insufficient study of internationalization issues in</p>	<p>2.1 Imperfection of digital systems for the exchange and transmission of information</p> <p>2.3 Non-compliance of established procedures with business processes.</p> <p>2.4 Lack of transparency in administrative processes / procedures.</p> <p>2.5 Lack of a well-functioning system for providing jobs or practical experience for graduates.</p> <p>2.6 Lack of international staff.</p> <p>2.7 Lack of staff motivation and involvement;</p>	<p>1 Observance and development of algorithms of administrative management processes in order to ensure their transparency and interconnection.</p> <p>2 Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists.</p> <p>3 Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of internationalization of the university.</p>



<p>the internal strategic documents of the university.</p> <p>2.6 Low level of development of digital competencies of administrative personnel.</p> <p>2.7 Insufficient involvement of teaching staff and students in corporate governance processes.</p>	<p>2.8 Lack of a system of advanced training of administrative personnel due to the appropriate postgraduate support;</p> <p>2.9 Fixed mindsets.</p> <p>2.10 Overestimation of targets / performance indicators and, as a result, their non-fulfillment.</p> <p>2.11 Failure to accept new working methods.</p> <p>2.12 Failure to develop youth policy taking into account international experience.</p> <p>2.13 Lack of clear regulations for information flows along the vertical and horizontal management, which leads to a decrease in the efficiency of information dissemination.</p>	<p>4 Development of intra-university standards for administrative processes in the field of internationalization.</p> <p>5 Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers</p> <p>6 Development of corporate management standards.</p>
<p><i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i></p>		
<p>3.1 Low number of modules taught in English.</p> <p>3.2 Non-compliance with the requirements for opening doctoral programs in some of the implemented areas of training.</p> <p>3.3 Orientation to Russian standards when designing the content of educational programs.</p> <p>3.4 Low compliance of electronic content with international standards.</p>	<p>3.1 Weak analytics for forecasting the need for specialists.</p> <p>3.2 Insufficient level of implementation and use of the anti-plagiarism system</p> <p>3.4 Lack of clear coordination on the part of the republican educational and methodological councils for educational programs aimed at improving the quality of educational programs.</p> <p>3.5 Decrease in the level of training of applicants.</p> <p>3.6 Lack of compulsory modules taught in English as part of the educational program.</p> <p>3.7 Development of new and innovative educational programs without taking into account international practice.</p> <p>3.8 Duration of the process of obtaining permission from the Authorized body in the field of education for the implementation of new and / or innovative educational programs.</p> <p>3.9 Failure to accept modern and innovative teaching methods.</p> <p>3.10 Imperfection of support systems for digital learning systems.</p>	<p>1 Allocation of budgetary funds for language support of teachers for conducting classes in three languages.</p> <p>2 Ensuring the continuity of educational programs.</p> <p>3 Determination of key competencies and skills of readiness for a career of future engineering students in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook</p> <p>4 Involvement of foreign scientists for consultations on the development of curricula in the framework of partnership agreements.</p> <p>5 Involvement of regional and foreign employers in the definition of key competencies of graduates.</p> <p>6 Involvement of regional and foreign employers in determining the key competencies of graduates.</p> <p>7 Creation of a base of key competencies of graduates that meet international standards.</p> <p>8 Creation of a new own information resource to neutralize threats during training using DLE.</p>
<p><i>4. Teaching staff</i></p>		
<p>4.1 Low level of external mobility of teaching staff and scientists (incoming and outgoing).</p> <p>4.2 Lack of staff speaking three languages.</p> <p>4.3 Insufficient development of management skills among scientists and researchers.</p>	<p>4.1 Lack of succession planning.</p> <p>4.2 Emigration of scientific personnel for the realization of their scientific potential.</p> <p>4.3 Lack of a flexible system for organizing foreign trips of teaching staff and scientists.</p>	<p>1 Participation in foreign courses to improve the qualifications of teaching staff on the use of DLE.</p> <p>2 Encouraging teaching staff and scientists to participate in international projects.</p> <p>3 Encouraging young scientists to conduct research and obtain doctoral qualifications.</p>

<p>4.4 Lack of favorable prospects for scientific personnel.</p> <p>4.5 Lack of appropriate postgraduate support to improve the qualifications of personnel.</p> <p>4.6 Fixed mindsets.</p>		<p>4 Application of international practice of creating a support group for postgraduate support and undergraduate training programs.</p> <p>5 Search for new programs and grants for mobility of teaching staff</p> <p>6 Search for new sources of funding for the organization of mobility and training of teaching staff.</p> <p>7 faculty members, including on the development of language competencies and intercultural communication.</p>
<i>5. Student mobility</i>		
<p>5.1 Low level of mobility of incoming students.</p> <p>5.2 The flow of outgoing academic mobility is mainly directed towards the Russian-speaking countries.</p> <p>5.2 Regional mobility (from the nearest neighboring countries) constitutes the bulk of the applicants.</p>	<p>5.1 Reduction in funding for outgoing academic mobility.</p>	<p>1 Active involvement of existing foreign partners in academic mobility programs.</p> <p>2 Attracting and supporting international students.</p> <p>3 Search for new programs for the organization of academic mobility of students, financed from extrabudgetary funds and funds of the university.</p> <p>4 Search for international funds for financing educational, scientific and sports student initiatives.</p> <p>5 Determination of key competencies and skills of readiness for a career of future engineering students in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook.</p>
<i>6. Collaboration and partnership</i>		
<p>6.1 Most of the cooperation agreements are not implemented, remaining to act only on paper.</p> <p>6.2 Low level of English proficiency among teaching staff and students.</p> <p>6.3 Lack of international collaborations.</p> <p>6.4 Weak integration of education, science and business.</p>	<p>6.1 Formal conclusion of tripartite agreements.</p> <p>6.2 Reducing the motivation of foreign partners to cooperate.</p>	<p>1. Development of an open dialogue platform for attracting foreign partners to conduct scientific research and commercialize the results.</p> <p>2. Development of an open dialogue platform to attract foreign partners to conduct scientific research and commercialize the results obtained.</p> <p>3. Creation of infrastructure to support the introduction of new technologies in teaching, research and management.</p> <p>4. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects</p> <p>5. Creation of a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators.</p>
<i>7. Science and innovation</i>		

<p>7.1 Orientation of educational programs, scientific research to the RF.</p> <p>7.2 Lack of direct international funding for research.</p> <p>7.3 Insufficient and low level of international publications in English.</p> <p>7.4 Lack of entrepreneurial and research skills.</p> <p>7.5 Insufficient application of research results or applied research in the field of economic development.</p> <p>7.6 Low RDED performance</p> <p>7.7 Weak development of commercialization of innovations.</p> <p>7.8 Lack of infrastructure to support the introduction of new technologies in teaching, research and management.</p> <p>7.9 Research stagnation infrastructure.</p> <p>7.10 Lack of scientific research in conjunction with leading foreign universities.</p>	<p>7.1 Low citation rate of scientific publications.</p> <p>7.2 Lack of awareness of the possibility of applying for international funding;</p> <p>7.3 Low percentage of close interaction with industry.</p> <p>7.4 Low percentage of R&amp;D commissioned by enterprises and commercialization of the results obtained.</p>	<p>1 1 Increasing the participation of teaching staff and scientists at international seminars, conferences, forums.</p> <p>2 2 Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English.</p> <p>3 Translation of the developed materials into English with the aim of publishing them in international journals.</p> <p>4 Encourage young scientists to conduct research and obtain doctoral qualifications.</p> <p>5 Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups.</p> <p>6 Increasing the participation of teaching staff and scientists at international seminars, conferences, forums.</p> <p>7 Establishing and strengthening ties with regional and republican industries.</p>
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## APPENDIX F

### Decision Matrix 1: O-T - the line of mutual influence of external factors

O-T: Opportunities + Threats		
Opportunities	Threats	Decisions
<i>1. Internationalization at the university level</i>		
1.1 Leading institution for technical disciplines in Central Asia. 1.2 Improving the position in the QS rankings. 1.3 Development of an alumni association to receive help and support from them.	1.1 Kazakhstan's restrained position in the international arena contributes to poor conversion of applications for funding research projects and a lack of international partners. 1.2. Growing ranking of QS partners. 1.3 Decrease in position in world rankings. 1.4 Regulated model of budgetary financing. 1.5 Lack of a systematic approach to internationalization in the current strategic documents of the Republic; 1.6 Youth emigration to foreign universities. 1.7 Transfer of the education system of the Republic of Kazakhstan to a distance format in connection with the coronavirus pandemic. 1.8 Lack of funds and resources for student grants, research and staff development.	1. Participation in exchange programs like Erasmus +, DAAD and Fullbright. 2. Creation of a specialized service for communication and interaction with graduates, including those living abroad. 3. Creation of a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators. 4. Creation of an action plan with a partner university before concluding a new contract. 5. Creation of a marketing service. 6. Development of corporate management standards. 7. Development of intra-university standards for administrative processes in the field of internationalization. 8. Search for new programs and competitions for financing collaboration initiatives. 9. Search for new sources of funding for the organization of mobility and training of teaching staff. 10. Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, training future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook.
<i>2. Administrative management, management structure, work with administrative staff</i>		
2.1 Annual advanced training of administrative personnel in the development of managerial and communication skills in republican and foreign educational organizations.	2.1 Imperfection of digital systems for the exchange and transmission of information 2.3 Non-compliance of established procedures with business processes. 2.4 Lack of transparency in administrative processes / procedures. 2.5 Lack of a well-functioning system for providing jobs or practical experience for graduates. 2.6 Lack of international staff. 2.7 Lack of staff motivation and involvement; 2.8 Lack of a system of advanced training of administrative personnel	1 Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university. 2 Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists. 3 Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of

	<p>due to the appropriate postgraduate support;</p> <p>2.9 Fixed mindsets.</p> <p>2.10 Overestimation of targets / performance indicators and, as a result, their non-fulfillment.</p> <p>2.11 Failure to accept new working methods.</p> <p>2.12 Failure to develop youth policy taking into account international experience.</p> <p>2.13 Lack of clear regulations for information flows along the vertical and horizontal management, which leads to a decrease in the efficiency of information dissemination.</p>	<p>internationalization of the university.</p> <p>4 Development of intra-university standards for administrative processes in the field of internationalization.</p> <p>5 Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers.</p> <p>6 Development of corporate management standards.</p>
<i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i>		
<p>3.1 Joint implementation of programs (academic and industrial);</p> <p>3.2 Cooperation for joint / double diplomas in the implementation of Double Degree programs.</p> <p>3.3 Development of online modules and programs, including MOOC;</p> <p>3.4 Development of educational programs in accordance with the requirements of employers.</p> <p>3.5 Development of educational programs focused on obtaining work qualifications;</p> <p>3.6 Development of working curricula for the VET system.</p> <p>3.7 Development of project-oriented programs.</p> <p>3.8 Development of new ways of assessing learning outcomes;</p> <p>3.9 Implementation of research results in the educational process.</p> <p>3.10 Transition to competence-based educational programs.</p> <p>3.11 Development of standards and quality management systems for programs in accordance with international practice.</p>	<p>3.1 Weak analytics for forecasting the need for specialists.</p> <p>3.2 Insufficient level of implementation and use of the anti-plagiarism system.</p> <p>3.4 Lack of clear coordination on the part of the republican educational and methodological councils for educational programs, aimed at improving the quality of educational programs.</p> <p>3.5 Decrease in the level of training of applicants.</p> <p>3.6 Lack of compulsory modules taught in English as part of the educational program.</p> <p>3.7 Development of new and innovative educational programs without taking into account international practice.</p> <p>3.8 Duration of the process of obtaining permission from the Authorized body in the field of education for the implementation of new and / or innovative educational programs.</p> <p>3.9 Failure to accept modern and innovative teaching methods.</p> <p>3.10 Imperfection of support systems for digital learning systems.</p>	<p>1 Application of research results in the development of educational programs.</p> <p>2 Improving the quality of technical education in line with international standards.</p> <p>3 Definition of new components of implementation in curricula, taking into account international academic requirements for students.</p> <p>4 Conclusion of partnership agreements with universities from far abroad.</p> <p>5 Involvement of regional and foreign employers in the definition of key competencies of graduates.</p> <p>6 Involvement of foreign scientists for consultations on the development of curricula in the framework of partnership agreements.</p> <p>7 Creation of infrastructure to support the introduction of new technologies in teaching, research and management.</p> <p>8 Creation of graduates key competencies base that correspond international standards.</p>
<i>4. Teaching staff</i>		
<p>4.1 Increasing the number of doctoral staff;</p> <p>4.2 Increasing the number of trilingual staff</p>	<p>4.1 Lack of succession planning</p> <p>4.2 Emigration of scientific personnel for the realization of their scientific potential</p> <p>4.3 Lack of a flexible system for organizing foreign trips of teaching staff and scientists</p>	<p>1. 1. Encouraging young scientists to conduct research and obtain doctoral qualifications.</p> <p>2. 2. Increasing the participation of teaching staff and scientists at international seminars, conferences, forums.</p> <p>3. Participation in exchange programs like Erasmus +, DAAD and Fulbright.</p>

		<p>4. Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English</p> <p>5. Providing the university with English-language electronic library resources through cooperation with foreign partners.</p> <p>6. Providing language support in preparation for entrance exams for master's and doctoral studies</p> <p>7. Improving the quality of preparation of articles in English for the publication of research results for submission to the international scientific community.</p>
<i>5. Student mobility</i>		
<p>5.1 Development of new directions of academic mobility, including with non-CIS countries</p> <p>5.2 Increasing the prestige and ranking of the university at the international level.</p> <p>5.3. Expansion of the “Education Hub in Central Asia” trend.</p>	<p>5.1 Reduction in funding for outgoing academic mobility</p>	<p>1. Active involvement of existing foreign partners in academic mobility programs.</p> <p>2. Search for international funds for financing educational, scientific and sports student initiatives.</p> <p>3. Search for new programs for the organization of academic mobility of students, financed from extrabudgetary funds and funds of the university</p> <p>4. Improvement of the library system in order to increase the availability of available resources for students.</p> <p>5. Creation of a network library with foreign partners.</p> <p>6. Creation of a specialized service for communication and interaction with graduates, including those living abroad.</p> <p>7. Increase in the share of membership in international associations</p> <p>8. Increase in the amount of electronic content on the university website in English.</p>
<i>6. Collaboration and partnership</i>		
<p>6. 1 Cooperation in the formation of a positive image of the university in the international market of educational services.</p> <p>6.2 Cooperation with Kazakh and foreign partner universities in library resources.</p> <p>6.2 Improving the work of the Career Development Center.</p> <p>6.3 Creation of a business and innovation hub.</p> <p>6.4 Increase income from non-grant programs through student recruitment.</p>	<p>6.1 Formal conclusion of tripartite agreements</p> <p>6.2 Reducing the motivation of foreign partners to cooperate</p>	<p>1 Improvement of the library system in order to increase the availability of available resources for students.</p> <p>2 Creation of a network library with foreign partners.</p> <p>3 Increase in participation in international exhibitions.</p> <p>4 Search for new areas of cooperation within the educational activities of the university, as well as the provision of specialized services on the basis of existing institutions of the university.</p>

		<p>5 Search for international funds for financing educational, scientific and sports student initiatives.</p> <p>6 Search for mechanisms of financing international initiatives, except from budgetary funds in order to reduce dependence on republican funding.</p> <p>7 Opening of the official representative office of the university abroad.</p> <p>8 Setting up a marketing service.</p>
<i>7. Science and innovation</i>		
<p>.1 Development of joint research with foreign partners;</p> <p>7.2 Development of research work in priority areas Industry 4.0.</p> <p>7.3 Establishing cooperation with foreign companies to research methods of mining.</p> <p>7.4 Presentation of research results at the international level.</p> <p>7.5 Commercialization of research results.</p>	<p>7.1 Low citation rate of scientific publications.</p> <p>7.2 Lack of awareness of the possibility of applying for international funding;</p> <p>7.3 Low percentage of close interaction with industry,</p> <p>7.4 Low percentage of R&amp;D commissioned by enterprises and commercialization of the results obtained</p>	<p>1 Encouraging young scientists to conduct research and obtain doctoral qualifications.</p> <p>2 Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects</p> <p>3 Development of an open dialogue platform to attract foreign partners to conduct research and commercialize the results.</p> <p>4 Involvement of regional and foreign employers in the definition of key competencies of graduates.</p>

## APPENDIX G

### Decision matrix 1: S-W - the line of mutual influence of internal factors

S-W: Strong points + Weak points		
Strong points	Weak points	Decision
<i>1. Internationalization at the university level</i>		
<p>1.1. Positions in ratings</p> <ul style="list-style-type: none"> <li>– Large increase in QS rankings during the first 2 years after joining</li> <li>– Rating on RankPro</li> <li>– Rating by webometrics</li> <li>– NAOCO National Ranking # 1 by Technical Universities</li> <li>– National IAAR Ranking as 1st by Technical Universities</li> </ul>	<p>4.1 Low interest of teaching staff and scientists in participation in international projects</p> <p>1.2 Low level of membership in international associations of universities;</p> <p>1.3 Insufficiently high level of digitalization of processes in the university.</p> <p>1.4 The library stock is predominantly in Russian.</p> <p>1.5 Insufficient financing of international projects and programs at the expense of budgetary funds and the university's own funds.</p> <p>1.6 Low level of participation in international educational exhibitions and projects.</p>	<p>1. Active involvement of existing foreign partners in academic mobility programs.</p> <p>2. Conclusion of partnership agreements with universities from far abroad.</p> <p>3. Opening of the official representative office of the university abroad.</p> <p>4. Improving the quality of technical education in accordance with international standards.</p> <p>5. Attracting and supporting foreign students</p> <p>6. Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers.</p>
<i>2. Administrative management, management structure, work with administrative staff</i>		
<p>2.1 Implementation of state policy in the management of the organization of higher education in accordance with the recommendations of the authorized body in the field of education.</p> <p>2.2 High level of management of the educational process.</p> <p>2.3 Development of the incentive system and development of the personnel reserve.</p>	<p>2.1 Lack of transparent management processes;</p> <p>2.2 Lack of interconnection between intra-university processes.</p> <p>2.3 Low level of time management.</p> <p>2.4 Partial compliance of the qualification requirements for administrative personnel with accepted international standards;</p> <p>2.5 Insufficient study of internationalization issues in the internal strategic documents of the university.</p> <p>2.6 Low level of development of digital competencies of administrative personnel.</p> <p>2.7 Insufficient involvement of teaching staff and students in corporate governance processes.</p>	<p>1. Compliance and development of algorithms for administrative management processes in order to ensure their transparency and interconnection.</p> <p>2. Development of corporate management standards.</p> <p>3. Development of intra-university standards for administrative processes in the field of internationalization.</p> <p>4. Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of internationalization of the university.</p> <p>5. Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists.</p>
<i>3. Internationalization of curricula, extra-curricular activities, learning outcomes</i>		
<p>3.1 Orientation of educational programs to Industry 4.0</p> <p>3.2 High employment rate of graduates 94.9%</p> <p>3.3 Student-centered academic policy.</p>	<p>3.1 Low number of modules taught in English</p> <p>3.2 Non-compliance with the requirements for opening doctoral programs in some of the implemented areas of training.</p>	<p>1. Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, preparation of future technical specialists for training in other countries and with the</p>



	<p>3.3 Orientation to Russian standards when designing the content of educational programs.</p> <p>3.4 Low compliance of electronic content with international standards</p>	<p>presence of the necessary foreign language and educational outlook</p> <p>2. Translation of the accumulated materials into English with the aim of publishing them in international journals.</p> <p>3. Involvement of foreign scientists for consultations on the development of curricula in the framework of partnership agreements.</p> <p>4. Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English</p> <p>5. Creation of a network library with foreign partners.</p> <p>6. Increase the amount of electronic content on the university website in English.</p>
<i>4. Teaching staff</i>		
<p>4.1 84% of teachers have postgraduate qualifications.</p> <p>4.2 Personnel policy of the university.</p> <p>4.3 50% of the teaching staff have a doctorate.</p>	<p>4.1 Low level of external mobility of teaching staff and scientists (incoming and outgoing).</p> <p>4.2 Lack of staff speaking three languages.</p> <p>4.3 Insufficient development of management skills among scientists and researchers.</p> <p>4.4 Lack of favorable prospects for scientific personnel.</p> <p>4.5 Lack of appropriate postgraduate support to improve the qualifications of personnel.</p> <p>4.6 Fixed attitudes of thinking.</p>	<ol style="list-style-type: none"> <li>1. Stimulating teaching staff and scientists to participate in international projects</li> <li>2. Increasing the participation of teaching staff and scientists at international seminars, conferences, forums.</li> <li>3. Participation in foreign courses to improve the qualifications of teaching staff on the use of DLE.</li> <li>4. Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English</li> <li>5. Search for new sources of funding for the organization of mobility and training of teaching staff.</li> <li>6. 6Search for new foreign partners to motivate scientific personnel.</li> <li>7. 7. Allocation of budgetary funds for language support of teachers for conducting classes in three languages.</li> </ol>
<i>5. Student mobility</i>		
<p>5.1 Academic mobility programs for students, including the positive dynamics of the level of outgoing mobility among students.</p>	<p>5.1 Low level of mobility of incoming students.</p> <p>5.2 The flow of outgoing academic mobility is mainly directed towards the Russian-speaking countries.</p>	<p>1. Search for new programs for the organization of academic mobility of students, financed from extrabudgetary funds and funds of the university</p>

	5.3 Regional mobility (from the nearest neighboring countries) constitutes the bulk of the applicants.	<ol style="list-style-type: none"> <li>1. Active involvement of existing foreign partners in academic mobility programs.</li> <li>2. Conclusion of partnership agreements with foreign universities.</li> <li>3. Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university.</li> <li>4. Improving the quality of technical education in accordance with international standards.</li> <li>5. Attracting and supporting foreign students</li> <li>6.</li> </ol>
<i>6. Collaboration and partnership</i>		
<ol style="list-style-type: none"> <li>6.1 Involvement of representatives of large international companies in the educational process.</li> <li>6.2 Industry partnerships, Tripartite agreements - University-Employer-Student.</li> <li>6.3 Involvement of KazMIRD and other institutes, teaching staff of the university to conduct consultations and examinations in specialized subject areas.</li> <li>6.4 Operating centers of the international level.</li> </ol>	<ol style="list-style-type: none"> <li>6.1 Most of the cooperation agreements are not implemented, remaining to act only on paper.</li> <li>6.2 Low level of English proficiency among teaching staff and students.</li> <li>6.3 Lack of international collaborations.</li> <li>6.4 Weak integration of education, science and business</li> </ol>	<ol style="list-style-type: none"> <li>1. Search for new programs and competitions for financing collaboration initiatives.</li> <li>2. Search for new areas of cooperation within the educational activities of the university, as well as the provision of specialized services on the basis of existing institutions of the university.</li> <li>3. Application of research results in the development of educational programs.</li> <li>4. Involvement of regional and foreign employers to determine the key competencies of graduates.</li> <li>5. Creation of a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators.</li> <li>6. Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups.</li> <li>7. Establishment and strengthening of communication with regional and republican industries.</li> </ol>
<i>7. Science and innovation</i>		
<ol style="list-style-type: none"> <li>7.1 Implementation of research results into production (development of prototypes).</li> <li>7.2 Development of the material and technical base for research activities.</li> <li>7.3 Cooperation with scientists from neighboring countries.</li> <li>7.4 Publications in journals with a high Impact factor</li> <li>7.5 Focus on the integration of IT with various industries.</li> </ol>	<ol style="list-style-type: none"> <li>7.1 Orientation of educational programs, scientific research to the Russian Federation.</li> <li>7.2 Lack of direct international funding for research.</li> <li>7.3 Insufficient and low level of international publications in English.</li> <li>7.4 Lack of entrepreneurial and research skills.</li> <li>7.5 Insufficient application of research results or applied research in the field of economic development.</li> </ol>	<ol style="list-style-type: none"> <li>1. Encouraging young scientists to conduct research and obtain doctoral qualifications.</li> <li>2. Creation of infrastructure to support the introduction of new technologies in teaching, research and management.</li> <li>3. Search for international funds for financing educational, scientific and sports student initiatives.</li> <li>4. Improving the quality of preparation of articles in English for</li> </ol>

	<p>7.6 Low R&amp;D indicators</p> <p>7.7 Weak development of commercialization of innovations.</p> <p>7.8 Lack of infrastructure to support the introduction of new technologies in teaching, research and management.</p> <p>7.9 Research stagnation infrastructure.</p> <p>7.10 Lack of scientific research in conjunction with leading foreign universities.</p>	<p>the publication of research results for presentation to the international scientific community.</p> <p>5. Implementation of research results or applied research in the real sector of the economy.</p> <p>6. Development of an open dialogue platform to attract foreign partners to conduct research and commercialize the results.</p> <p>7. Creation of a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators.</p>
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## APPENDIX H

### Decision Matrix 2

<i>Internationalization at the university level</i>		
<div>Internal factors</div> <div>External factors</div>	<b>Strong points</b> 1.1. Positions in ratings – Large increase in QS rankings during the first 2 years after joining – Rating on RankPro – Rating by webometrics – NAOCO National Ranking is the 1st in a range of Technical Universities – National IAAR Ranking as 1st by Technical Universities	<b>Weak points</b> 1. Low interest of teaching staff and scientists in participation in international projects 2. Low level of membership in international associations of universities; 3. Insufficiently high level of digitalization of processes in the university. 4. The library fund is predominantly in Russian. 5. Insufficient financing of international projects and programs at the expense of budgetary funds and the university's own funds. 6. Low level of participation in international educational exhibitions and projects.
	<b>Opportunities</b> 1. Leading institution in the field of technical disciplines in Central Asia 2. Improving positions in the QS rating 3. Development of an alumni association to receive help and support from them	<b>Possible strategies:</b> 1. Improving the quality of technical education in accordance with international standards (S1, O2). 2. Creation of a specialized service for communication and interaction with graduates, including those living abroad (O3). 3. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects (S1, O2) 4. Participation in exchange programs like Erasmus +, DAAD and Fulbright. (O1, Th5, Th6) 5. Creation of a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators (O1, Th1, U4). 6. Creation of an action plan with a partner university before concluding a new contract. (O 1) 7. Creation of a marketing service (O1, Th5, Th6)
		<b>Possible strategies:</b> 1. Stimulating teaching staff and scientists to participate in international projects (S1, O1) 2. Increase in the share of membership in international associations (S1, O1, O2) 3. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects. (W 3, W 5) 4. Providing the university with English-language electronic library resources through cooperation with foreign partners. (O1, O2, W 3) 5. Development of cooperation with foreign publications and electronic resources. (W 4, W 6) 6. Search for new programs and competitions for financing collaboration initiatives. (W 1, W 5, W2, O 1) 7. Increasing participation in international exhibitions. (W 6, O1) 8. Creation of a marketing service (O 1, O2) 9. Active involvement of existing foreign partners in academic mobility programs. (W1, W6, Th3)

	<p>8. Development of intra-university standards for administrative processes in the field of internationalization. (O1, Th 5, Th7)</p> <p>9. 9. Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, training future technical specialists for training in other countries and with the presence of the necessary foreign language and educational horizons (O1, O2, O, Th3, Th6)</p>	<p>10. Conclusion of partnership agreements with universities of the far abroad. (W1, Th6, SI4)</p> <p>11. Opening of the official representative office of the university abroad. (Th6, SI2)</p> <p>12. Attraction and support of foreign students (W4, W6, Th8)</p>
<p><b>Threats</b></p> <p>1. Kazakhstan's restrained position in the international arena contributes to poor conversion of applications for funding research projects and a lack of international partners.</p> <p>2. A growing ranking of QS partners</p> <p>3. Decrease in position in world rankings</p> <p>4. Regulated model of budget financing.</p> <p>5. Lack of a systematic approach to internationalization in the current strategic documents of the Republic;</p> <p>6. Emigration of youth to foreign universities</p> <p>7. Transfer of the education system of the Republic of Kazakhstan to a distance format in connection with the coronavirus pandemic.</p> <p>8. Lack of funds and resources for student grants, research and staff development.</p>	<p><b>Possible strategies:</b></p> <p>1. Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university. (S1, Th2, Th3)</p> <p>2. Search for mechanisms of financing international initiatives except for budgetary funds in order to reduce dependence on republican funding. (Th4, Th1)</p> <p>3. Creation of mechanisms and tools for attracting gifted students. (S1, O6)</p> <p>4. Participation in foreign courses to improve the qualifications of teaching staff on the use of DLE. (S1, Th7, Th8)</p> <p>5. Creation of a new own information resource to neutralize threats during training using DLE (Th17, Th6)</p> <p>6. Search for international funds for financing educational, scientific and sports student initiatives. (Th 1, Th6, Th 4)</p> <p>7. Search for new programs and competitions for financing collaboration initiatives.</p> <p>8. Search for new sources of funding for the organization of mobility and training of teaching staff. (Th 4, Th 8)</p> <p>9. Development of corporate management standards. (Th1, Th3, Th5, Th8)</p>	<p><b>Possible strategies:</b></p> <p>1. Improving the quality of technical education in accordance with international standards. (U2, U3)</p> <p>2. Providing the university with English-language electronic library resources through cooperation with foreign partners. (W4, Th 6)</p> <p>3. Definition of new components of implementation in curricula, taking into account international academic requirements for students. (Th3, Th6, W2)</p> <p>4. Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university. (Th1, Th2, Th 3, W2, W6)</p> <p>5. Search for new programs and competitions for financing collaboration initiatives. (U1, U4, W1, W5)</p> <p>6. Development of intra-university standards for administrative processes in the field of internationalization. (Th5, W2)</p> <p>7. Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers (Th2, Th3, Th7, W3, W4)</p>
Administrative management, management structure, work with administrative staff		

<div style="text-align: center;"> <p><b>Internal factors</b></p> <p><b>External factors</b></p> </div>	<p><b>Strengths</b></p> <ol style="list-style-type: none"> <li>1. Implementation of state policy in the management of the organization of higher education in accordance with the recommendations of the authorized body in the field of education.</li> <li>2. High level of management of the educational process.</li> <li>3. Development of the incentive system and development of the personnel reserve.</li> </ol>	<p><b>Weaknesses</b></p> <ol style="list-style-type: none"> <li>1. Lack of transparent administrative management processes;</li> <li>2. Lack of interconnection between intra-university processes.</li> <li>3. Low level of time management.</li> <li>4. Partial compliance of the qualification requirements for administrative personnel with accepted international standards;</li> <li>5. Insufficient study of internationalization issues in the internal strategic documents of the university.</li> <li>6. Low level of development of digital competencies of administrative personnel.</li> <li>7. Insufficient involvement of teaching staff and students in corporate governance processes.</li> </ol>
<p><b>Opportunities</b></p> <ol style="list-style-type: none"> <li>1. Annual advanced training of administrative personnel in the development of managerial and communication skills in republican and foreign educational organizations.</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1. Development of intra-university standards for administrative processes in the field of internationalization. (S1, O1)</li> <li>2. Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of internationalization of the university. (O1, S2)</li> <li>3. Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university. (S1, S3, O1, Th5, Th6)</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1. Development of intra-university standards for administrative processes in the field of internationalization. (W1, W5, W7)</li> <li>2. Conducting trainings, round tables, refresher courses with the participation of foreign specialists for administrative workers involved in managing the process of internationalization of the university. (O1, W4, W6, W4)</li> <li>3. Compliance and development of algorithms for administrative management processes in order to ensure their transparency and interconnection. (W1, W3, W 5)</li> <li>4. Development of corporate management standards. ... (W1, W2, W3, W 5)</li> <li>five.</li> </ol>
<p><b>Threats</b></p> <ol style="list-style-type: none"> <li>1. Imperfection of digital systems for the exchange and transmission of information</li> <li>2. Inconsistency of established procedures with business processes.</li> <li>3. Lack of transparency in administrative processes / procedures.</li> </ol> <ol style="list-style-type: none"> <li>1. Lack of a well-functioning system of providing jobs or practical experience for graduates.</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1. Development of intra-university standards for administrative processes in the field of internationalization. (S2, Th2, Th3, Th9)</li> <li>2. Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of internationalization of the university. (S3, Th3, Th6, Th7, Th8)</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1. Observance and development of algorithms of administrative management processes in order to ensure their transparency and interconnection. (W1, Th1, Th2, Th3)</li> <li>2. Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists. (O1, W3, W4, Th6, Th10)</li> </ol>

<ol style="list-style-type: none"> <li>2. Lack of international staff.</li> <li>3. Lack of staff motivation and involvement;</li> <li>4. Lack of a system of advanced training of administrative personnel due to the appropriate postgraduate support;</li> <li>5. Fixed attitudes of thinking</li> <li>6. Overestimation of target indicators / performance indicators and, as a result, their non-fulfillment.</li> <li>7. Failure to accept new working methods.</li> <li>8. Failure to develop youth policy taking into account international experience.</li> <li>9. Lack of clear regulations for information flows along the vertical and horizontal management, which leads to a decrease in the efficiency of information dissemination.</li> </ol>	<ol style="list-style-type: none"> <li>1. Application of international practice of creating a support group for postgraduate support and undergraduate study programs.(S1, Th1, Th3)</li> <li>2. Compliance and development of algorithms for administrative management processes in order to ensure their transparency and interconnection.(S1, Y5)</li> <li>3. Development of corporate management standards. (S1, S2, Th8, Th2, Th3)</li> <li>4. Search for new foreign partners to motivate personnel. (S3, Th6, Th5, Th10)</li> <li>5. Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists.(S2, S3, O1, Th6, Th10)</li> <li>6. Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers (S3, O1, Th6, Th2, Th12)</li> <li>7. Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of internationalization of the university .(S1, S2, O1, Th11)</li> </ol>	<p>Conducting trainings, round tables, refresher courses for administrative workers involved in managing the process of internationalization of the university.(O1, Th7, Th8, Th10)</p> <ol style="list-style-type: none"> <li>1. Development of intra-university standards for administrative processes in the field of internationalization.(W1, W2, W5, Th12, Th1)</li> <li>2. Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling of an e-learning space in order to form professional foreign language competence of future engineers (W6, Th11, Th4)</li> <li>3. Development of corporate management standards. (Th1, Th2, W1, W7)</li> <li>4. Compliance and development of algorithms for administrative management processes in order to ensure their transparency and interconnection. (Th1, Th2, W1, W7)</li> </ol>
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<i>Internationalization of curricula, extra-curricular activities, learning outcomes</i>		
<div>Internal factors</div> <div>External factors</div>	<b>Strengths</b> <ol style="list-style-type: none"> <li>1. Orientation of educational programs to Industry 4.0</li> <li>2. High level of employment of graduates 94.9%</li> <li>3. Academic policy focused on the needs of students.</li> </ol>	<b>Weaknesses</b> <ol style="list-style-type: none"> <li>1. Low number of modules taught in English</li> <li>2. Non-compliance with the requirements for opening doctoral programs in some of the implemented areas of training.</li> <li>3. Orientation to Russian standards when designing the content of educational programs.</li> <li>1. 4. Low compliance of electronic content with international standards.</li> </ol>
	<b>Possible strategies:</b> <ol style="list-style-type: none"> <li>1. Definition of new components for implementation in curricula, taking into account international academic requirements for students. (S1, O1, O2, O10)</li> <li>2. Creation of a base of key competencies of graduates that meet international standards. (S2, O1, O2, O4, O5, O6, O10)</li> <li>3. Involvement of foreign scientists for consultations on the development of curricula in the framework of partnership agreements. (S3, O7, O11, O10)</li> <li>4. Involvement of regional and foreign employers to determine the key competencies of graduates. (S1, S2, O1, O4, O11, O10)</li> <li>5. Ensuring the continuity of curricula. (S3, O6)</li> <li>6. Application of research results in the development of educational programs (S1, O8, O9)</li> <li>7. Improving the quality of technical education in accordance with international standards. (O11, O2, S3)</li> <li>8. Conclusion of partnership agreements with universities of the far abroad. (S3, O1, O2, O11)</li> <li>9. Creation of infrastructure to support the introduction of new technologies in teaching, research and management. (O3, S3, O7)</li> </ol>	<b>Possible strategies:</b> <ol style="list-style-type: none"> <li>1. Definition of new components of implementation in curricula, taking into account international academic requirements for students (W3, W4, O2, O11).</li> <li>2. Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications (W1, W3, W4, O3)</li> <li>3. Allocation of budgetary funds for language support of teachers for conducting classes in three languages (W1, O, O11)</li> <li>4. Involvement of foreign scientists for consultations on the development of curricula within the framework of partnership agreements (W2, W3, O9, O1)</li> <li>5. Conclusion of partnership agreements with universities from far abroad (W3, O2, O7, O11)</li> <li>6. Application of research results in the development of educational programs (W2, O9, O11)</li> <li>7. Determination of key competencies and skills of readiness for a career of future engineering students in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational horizons (W1, W3, O2, O10, O11)</li> <li>8. Translation of the accumulated materials into English for the purpose of publishing them in international journals (W1, W2, W3, O2, O9)</li> </ol>



		<p>9. Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English (W3, O2, O11)</p> <p>10. Creation of a network library with foreign partners (W3, W4, O2)</p> <p>11. Increasing the amount of electronic content on the university website in English (W4, O3)</p>
<p><b>Threats</b></p> <ol style="list-style-type: none"> <li>1. Weak analytics for forecasting the need for specialists.</li> <li>2. Insufficient level of implementation and use of the anti-plagiarism system.</li> <li>3. Lack of clear coordination on the part of the republican educational and methodological councils for educational programs, aimed at improving the quality of educational programs.</li> <li>4. Decrease in the level of training of applicants.</li> <li>5. Lack of compulsory modules taught in English as part of the educational program.</li> <li>6. Development of new and innovative educational programs without taking into account international practice.</li> <li>7. Duration of the process of obtaining permission from the Authorized body in the field of education for the implementation of new and / or innovative educational programs.</li> <li>8. Failure to accept modern and innovative teaching methods.</li> <li>9. Imperfection of support systems for digital learning systems.</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1. Definition of new components of implementation in curricula, taking into account international academic requirements for students. (S1, Th3, Th6, Th7)</li> <li>2. Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, training future technical specialists for training in other countries and with the presence of the necessary foreign language and educational horizons. (S1, S3, Th6, Th5, Th4)</li> <li>3. Development of mechanisms for interaction of all subjects of the educational process of internationalization through the integrated information system of training. (S3, Th2, Th9)</li> <li>4. Creation of a base of key competencies of graduates that meet international standards (S3, Th1, Th5)</li> <li>5. Ensuring the continuity of educational programs. (S3, O10, Th3)</li> <li>6. Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications. (O3, O11, Th2, Th5, Th7, Th9, Th8)</li> <li>7. Allocation of budgetary funds for language support of teachers for conducting classes in three languages. (O3, Th5, Th8)</li> <li>8. Involvement of regional and foreign employers to determine the key competencies of graduates. (S1, S2, Th1, Th3)</li> <li>9. Creation of infrastructure to support the introduction of new technologies in teaching, research and management. (Th2, Th9, O3)</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1 Allocation of budgetary funds for language support of teachers for conducting classes in three languages (O5, W1, W3, Th6)</li> <li>2 Ensuring the continuity of curricula (W2, Th2, Th1, Th6)</li> <li>3 Determination of key competencies and skills of readiness for a career of future engineering students in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational horizons (W1, W4, Th6, Th3, Th4, Th9)</li> <li>4 Involvement of foreign scientists for consultations on the development of curricula within the framework of partnership agreements (W3, Th6, Th3, Th8)</li> <li>5 Involvement of regional and foreign employers in the definition of key competencies of graduates. (W3, Th1, Th3)</li> <li>6 Creation of a base of key competencies of graduates that meet international standards. (CW, Th7, Th8, Th5)</li> <li>7 Creation of a new own information resource to neutralize threats during training using DLE (W4, Th9, O3)</li> </ol>
<i>Teaching staff</i>		

<p style="text-align: center;"><b>Internal factors</b></p> <p style="text-align: center;"><b>External factors</b></p>	<p><b>Strengths</b></p> <ol style="list-style-type: none"> <li>1. 84% of teachers have postgraduate qualifications.</li> <li>2. Personnel policy of the university.</li> <li>3. 50% of the teaching staff have a doctorate.</li> </ol>	<p><b>Weaknesses</b></p> <ol style="list-style-type: none"> <li>1.Low level of external mobility of teaching staff and scientists (incoming and outgoing).</li> <li>2.Lack of staff speaking three languages.</li> <li>3.Insufficient development of management skills among scientists and researchers.</li> <li>4.Lack of favorable prospects for scientific personnel.</li> <li>5.Lack of appropriate postgraduate support to improve the qualifications of personnel.</li> <li>6.Fixed attitudes of thinking.</li> </ol>
<p><b>Opportunities</b></p> <ol style="list-style-type: none"> <li>1. Increase in the number of staff with doctoral qualifications;</li> <li>2. Increase in the number of staff speaking three languages</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1. Identification of priority areas for advanced training of the teaching staff, including the development of language competencies and intercultural communications (S1, O2)</li> <li>2. Encouraging young scientists to conduct research and obtain doctoral qualifications (S1, S3, O2)</li> <li>3. Providing language support in preparation for entrance examinations for master's and doctoral studies (S3, O1, O2)</li> <li>4. Allocation of budgetary funds for language support of teachers for conducting classes in three languages (S2, O1, O2)</li> <li>5. Search for new sources of funding for organizing mobility and internship of teaching staff (S1, S2, O2)</li> <li>6.Increasing the participation of teaching staff and scientists at international seminars, conferences, forums (S2, B2)</li> <li>7.Participation in exchange programs like Erasmus +, DAAD and Fullbright (S1, S2, O2)</li> <li>8. Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English (S1, S2, O2)</li> <li>9.Providing the university with English-language electronic library resources through cooperation with foreign partners (S2, O2)</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1. Search for new programs and grants for mobility of teaching staff (W1, W4, O1, O2)</li> <li>2. Search for new foreign partners to motivate scientific personnel (W1, W3, W4, W6, O2)</li> <li>3. Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists (W3, W6)</li> <li>4. Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications (W2, W5, O1)</li> <li>5. Application of international practice of creating a support group for postgraduate support and undergraduate study programs (W5, W2, O2)</li> <li>6.Stimulating teaching staff and scientists to participate in international projects (W1, W4, O2)</li> <li>7.Increasing the participation of teaching staff and scientists at international seminars, conferences, forums (W4, W2, O2, Th2)</li> <li>8.Participation in foreign courses to improve the qualifications of teaching staff on the use of DLE (W4, W5, Th3)</li> <li>9. Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English (W1, O2, W2)</li> </ol>

	10.Improving the quality of preparation of articles in English for the publication of research results for presentation to the international scientific community (S1, S2, O2, 1O)	10. Search for new sources of funding for the organization of mobility and internships for teaching staff (W1, W4, O1, O2) 11. Allocation of budgetary funds for language support of teachers for conducting classes in three languages (W2, W5, O2)
<b>Threats</b> 1. Lack of succession planning 2. Emigration of scientific personnel to realize their scientific potential • 3. Lack of a flexible system for organizing foreign trips of teaching staff and scientists	<b>Possible strategies:</b> 1. Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English (S2, Th2) 2. Encouraging young scientists to conduct research and obtain doctoral qualifications (S1, S3, Th1, Th2) 3. Providing language support in preparation for entrance examinations for master's and doctoral studies (S2, Th1, Th2) 4. Allocation of budgetary funds for language support of teachers for conducting classes in three languages (S2, Th3, O2) 5. Participation in foreign courses to improve the qualifications of teaching staff on the use of DOT (S2, S1, Th3) 6.Increasing the participation of teaching staff and scientists at international seminars, conferences, forums (S1, S2, Th2, Th3) 7. Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications (S2, B2, Th3) 8.Creating a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators (S1, S2, S3, Th1, Th3) 9.Search for new programs and grants for mobility of teaching staff (S2, Th3, Th2)	<b>Possible strategies:</b> 1 Participation in foreign courses to improve the qualifications of teaching staff on the use of DLE. (W2, Th2) 2 Encouraging teaching staff and scientists to participate in international projects. (W4, Th2, Th3) 3 Encouraging young scientists to conduct research and obtain doctoral qualifications (W5, Th1, Th2) 4 Application of international practice of creating a support group for postgraduate support and undergraduate training programs. (W5, Th1, Th2) 5 Search for new programs and grants for mobility of teaching staff. (W1, Th2) 6 Search for new sources of funding for organizing mobility and internship of teaching staff. (W1, Th2) 7 Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications (W2, Th3, Th2)
Students mobility		



	<p>4. Search for new programs for the organization of academic mobility of students, funded by extrabudgetary funds and funds of the university (S1, Th1)</p> <p>5. Increase the amount of electronic content on the university website in English (S1, Th1)</p> <p>6. Opening of the official representative office of the university abroad (S1)</p>	<p>extrabudgetary funds and funds of the university (W1, W2, W3, Th1)</p> <p>4 Search for international funds for financing educational, scientific and sports student initiatives (W1, Th1)</p> <p>5 Determination of key competencies and skills of readiness for a career of future engineering students in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook (W3, Th1)</p>
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<i>Collaboration and partnership</i>		
<div>Internal factors</div> <div>External factors</div>	<b>Strengths</b> <ol style="list-style-type: none"> <li>1. Involvement of representatives of large international companies in the educational process.</li> <li>2. Industry partnerships,</li> <li>3. Tripartite agreements - University-Employer-Student.</li> <li>4. Involvement of <b>KazMIRD</b> and other institutes, teaching staff of the university to conduct consultations and examinations in specialized subject areas.</li> <li>5. Operating centers of the international level.</li> </ol>	<b>Weaknesses</b> <ol style="list-style-type: none"> <li>1. Most of the cooperation agreements are not implemented, remaining to act only on paper.</li> <li>2. Low level of English proficiency among teaching staff and students.</li> <li>3. Lack of international collaborations.</li> <li>4. Weak integration of education, science and business</li> </ol>
	<b>Opportunities</b> <ol style="list-style-type: none"> <li>1. Cooperation in the formation of a positive image of the university in the international market of educational services.</li> <li>2. Cooperation with Kazakh and foreign partner universities in library resources.</li> <li>3. Improving the work of the Career Development Center.</li> <li>4. Creation of a business and innovation hub.</li> <li>5. Increase income from non-grant programs by recruiting students</li> </ol>	<b>Possible strategies:</b> <ol style="list-style-type: none"> <li>1. Increase in the amount of electronic content on the university website in English. (S1, B1)</li> <li>2. Opening of the official representative office of the university abroad. (S1, S2, O1)</li> <li>3. Providing the university with English-language electronic library resources through cooperation with foreign partners. (S1, S5, O2)</li> <li>4. Improvement of the library system in order to increase the availability of available resources for students. (S3, O2)</li> <li>5. Creation of a network library with foreign partners. (S3, O2)</li> <li>6. Organization of postgraduate support of graduates. (S2, S3, O1, O3, O4)</li> <li>7. Search for new areas of cooperation within the educational activities of the university, as well as the provision of specialized services on the basis of existing institutions of the university. (S4, S5, O4, O5)</li> <li>8. Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups. (S2, O4, O5)</li> <li>9. Increased participation in international exhibitions. (S5, S1, O1, O4)</li> <li>10. Search for international funds for financing educational, scientific and sports student initiatives. (S5, O1, O3, O4)</li> </ol>
		<b>Possible strategies:</b> <ol style="list-style-type: none"> <li>1. Resumption of work on previously concluded contracts (W1, O4, O5)</li> <li>2. Creation of an action plan with a partner university before concluding a new agreement (W3, O1, O2)</li> <li>3. Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications (W2, W3, O1)</li> <li>4. Creation of a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators (W3, W4, O4)</li> <li>5. Search for new programs and competitions for financing collaboration initiatives (W3, O1, O4)</li> <li>6. Search for new areas of cooperation within the educational activities of the university, as well as the provision of specialized services on the basis of existing institutions of the university (W4, W1, O4, O5)</li> <li>7. Application of research results in the development of educational programs (W4, O2,)</li> <li>8. Involvement of regional and foreign employers in the definition of key competencies of graduates (W2, O3, O3)</li> <li>9. Creating a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators (W2, W3, O4, O5)</li> </ol>

	11. Search for mechanisms for financing international initiatives other than at the expense of budgetary funds in order to reduce dependence on republican funding (S1, O4, O5) 12. Creating a marketing service (O1, O4)	10. Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups (W1, W4, O4) 11. Establishing and strengthening ties with regional and republican industries (W1, W4, O4, O5)
<b>Threats</b> 1. Formal conclusion of tripartite agreements 2. Reducing the motivation of foreign partners to cooperate	<b>Possible strategies:</b> 1. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects (S1, S4, Th1, Th2) 2. Involvement of regional and foreign employers to determine the key competencies of graduates (S2, S3, Th1) 3. Conclusion of partnership agreements with foreign universities (S5, Th2) 4. Opening of the official representative office of the university abroad (S1, Th2) 5. Search for new areas of cooperation within the educational activities of the university, as well as the provision of specialized services on the basis of existing institutions of the university (S1, S2, S5, Th1, Th2) 6. Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups (S2, S4, S5, Th2) 7. Establishment and strengthening of communication with regional and republican industries (S2, S3, S4, Th1) 8. Implementation of research results or applied research in the real sector of the economy (S2, S4, Th1)	<b>Possible strategies:</b> 1. Development of an open dialogue platform to attract foreign partners to conduct scientific research and commercialize the results (W1, W4, UTh2) 2. Creation of infrastructure to support the introduction of new technologies in teaching, research and management (W4, W2, Th1) 3. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects (W4, W2, Th1, Th2) 4. Creating a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators (W3, Th1, Th2)

<i>Science and innovation</i>		
<div>Internal factors</div> <div>External factors</div>	<b>Strengths</b> Implementation of research results into production (development of prototypes). 1. Development of the material and technical base for research activities. 2. Cooperation with scientists from neighboring countries. 3. Publications in journals with a high Impact factor 4. Focus on the integration of IT with various industries.	<b>Weaknesses</b> 1. Orientation of educational programs, scientific research to the Russian Federation. 2. Lack of direct international funding for research. 3. Insufficient number and low level of international publications in English. 4. Lack of entrepreneurial and research skills. 5. Insufficient application of research results or applied research in the field of economic development. 2. Low indicators R&D 3. Weak development of commercialization of innovations. 8. Lack of infrastructure to support the introduction of new technologies in teaching, research and management. 9. Research infrastructure stagnation. 10. Lack of scientific research in conjunction with leading foreign universities
	<b>Possible strategies:</b> 1. Improving the quality of preparation of articles in English for the publication of research results for presentation to the international scientific community (S4, S3, O1, O4) 2. Development of an open dialogue platform to attract foreign partners to conduct scientific research and commercialize the results obtained (S5, O3, O5) 3. Encouraging young scientists to conduct research and obtain doctoral qualifications (S1, S2, O2, O1) 4. Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects (S5, S3, S2, O1, O3) 5. Involvement of regional and foreign employers in the definition of key competencies of graduates (S3, O1, O2)	<b>Possible strategies:</b> 1. Conclusion of partnership agreements with universities from far abroad (W1, W 10, W3, O4, O1) 2. Increasing the participation of teaching staff and scientists at international seminars, conferences, forums (W2, W3, W10, O3, O4) 3. Translation of the accumulated materials into English for the purpose of publishing them in international journals (W3, O1, O4) 4. Establishing and strengthening ties with regional and republican industries (W4, W5, W6, W7, O2, O5) 5. Implementation of research results or applied research in the real sector of the economy (W5, W7, W8, O2) 6. Improving the library system in order to increase the availability of available resources for students (W10, O1, O4, W8, W3) 7. Creating a network library with foreign partners (W10, O1, O4, W8, W3) 8. Build infrastructure to support the introduction of new technologies in teaching, research and management (W8, W7, O5)



		<p>9.Improving the quality of preparation of articles in English for publication of research results for presentation to the international scientific community (W3, O1, O4)</p> <p>10. Development of an open dialogue platform to attract foreign partners to conduct scientific research and commercialize the results obtained (W7, W8, W9, O4, O5)</p> <p>11.Stimulating young scientists to conduct research and obtain doctoral qualifications (W4, W8, W9, O1)</p> <p>12. Search for international funds for financing educational, scientific and sports student initiatives (W10, O4, O5, O1)</p> <p>13.Creating a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators (W10, W9, O4)</p>
<p><b>Threats</b></p> <ol style="list-style-type: none"> <li>1. Low level of citation of scientific publications</li> <li>2. Lack of awareness of the possibility of applying for international funding</li> <li>3. Low percentage of close interaction with industry,</li> <li>4. Low percentage of R&amp;D commissioned by enterprises and commercialization of the results obtained</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1. Improving the quality of preparation of articles in English for the publication of research results for submission to the international scientific community (S3, S4, Th1)</li> <li>2. Development of an open dialogue platform to attract foreign partners to conduct scientific research and commercialize the results (S1, S2, Th2, Th3, Th4)</li> <li>3. Translation of the accumulated materials into English for the purpose of publishing them in international journals (S3, S4, Th1)</li> <li>4. Implementation of research results or applied research in the real sector of the economy (S1, S2, Th3, Th4)</li> </ol>	<p><b>Possible strategies:</b></p> <ol style="list-style-type: none"> <li>1 Increasing the participation of teaching staff and scientists at international seminars, conferences, forums (W2, W10, Th1, Th2)</li> <li>2 Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English (W3, Th2)</li> <li>3 Translation of the accumulated materials into English for the purpose of publishing them in international journals (W1, W10, Th1)</li> <li>4 Encourage young scientists to conduct research and obtain doctoral qualifications (W6, W9)</li> <li>5 Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups (W9, W7, Th4, Th3)</li> <li>6 Establishing and strengthening ties with regional and republican industries (W6, W7, Th4, Th3)</li> </ol>

# APPENDIX I

## Decision Matrix 3

Nº	Decision	Factors
<i>Internationalization at the university level</i>		
1.	Active involvement of existing foreign partners in academic mobility programs	W1 W6 Th3
2.	Conclusion of partnership agreements with universities from far abroad	W1 Th6 W4
3.	Providing the university with English-language electronic library resources through cooperation with foreign partners.	B1 B2 W 3 W4 Th6
4.	Ensuring constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university	Th1 Th2 Th3 W2 W6
5.	Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook	O1 O2 Th2 Th3 Th6
6.	Definition of new components of implementation in curricula, taking into account international academic requirements for students	Th3 Th6 W2
7.	Opening of the official representative office of the university abroad	Th6 W2
8.	Improving the quality of technical education in accordance with international standards	S1 O2 Th2 Th3
9.	Search for new programs and competitions for financing collaboration initiatives.	W2 O 1 Th1 Th4 W1 W5
10.	Attracting and supporting international students	W4 W6 Th8
11.	Development of cooperation with foreign publications and electronic resources.	W 4 W 6
12.	Development of intra-university standards for administrative processes in the field of internationalization.	O1 Th 5 Th7 W2
13.	Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers	Th2 Th3 Th7 W3 W4
14.	Marketing service creation	O 1 O2 Th5 Th6
15.	Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects	S1 O2 W 3 W 5
16.	Establishment of an action plan with a partner university before negotiation a new contract.	O1
17.	Creation of a system of incentives for teaching staff and scientists to expand international cooperation and form a network of international collaborators	O1 Th1 Th4
18.	Creation of a specialized service for communication and interaction with graduates, including those living abroad	O2
19.	Encouraging teaching staff and scientists to participate in international projects	W1 O 1
20.	Increase in the share of membership in international associations	W1 O1 2
21.	Increased participation in international exhibitions.	W 6 O1
22.	Participation in exchange programs like Erasmus +, DAAD and Fulbright.	O1 Th5 Th6
<i>Administrative management, management structure, work with administrative staff</i>		
23.	Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university	S1 S3 O1 Th5 Th6
24.	Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists	S2 S3 O1 Th6 Th10 W3 W4
25.	Search for new foreign partners to motivate personnel	S3 Th6 Th5 Th10
26.	Application of international practice of creating a support group for postgraduate support and undergraduate study programs	S1 Th1 Th3
27.	Conducting trainings, round tables, refresher courses, including with the participation of foreign specialists, for administrative workers involved in managing the process of internationalization of the university	O1 W4 W6 W4 O1 S2 S3 Th3 Th6 Th7 Th8 S1 S2 O1 Th11 O1 Th10

28.	Development of intra-university standards for administrative processes in the field of internationalization	S1 O1 W1 W5 W7 S2 Th2 Th3Th9 W1 W2 W5 Th12 Th1
29.	Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers	S3 O1 Th6 Th2 Th12 W6 Th11 Th4
30.	Development of corporate management standards	W1 W2 W3 W 5 S12 Th8 Th2 Th3 Th1 W7
31.	Compliance and development of algorithms for administrative management processes in order to ensure their transparency and interconnection	W1 W3 W 5 S1 Th5 W1 Th3 Th1 Th2 W7
<i>Internationalization of curricula, extra-curricular activities, learning outcomes</i>		
32.	Allocation of budgetary funds for language support of teachers for conducting classes in three languages	O3 Th5 Th8 W1 B2 O11 W3 Th6
33.	Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications	O3 B11 Th2 Th5 Th7 Th9 Th8 W1 W3 W4 O3
34.	Conclusion of partnership agreements with universities from far abroad	C3 O1 O2 O7 O11
35.	Ensuring the continuity of curricula	S3 O6 W2 Th2 Th1 Th6 O10 Th3
36.	Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook	S1 S3 Th6 Th5 Th4 W1 W3 O2 O10 O11 W4 Th3 Th4 Th9
37.	Definition of new components of implementation in curricula, taking into account international academic requirements for students	S1 Th3 Th6 Th7 W3 W4 O2 O11 C1 O1 O2 O10
38.	Translation of the accumulated materials into English for the purpose of publishing them in international journals	W1 W2 W3 O2 O9
39.	Improving the quality of technical education in accordance with international standards	O11 O2 S3
40.	Involvement of foreign scientists for consultations on the development of curricula in the framework of partnership agreements	S3 O7 O11 O10 W2 W3 O9 O1 W3 Th6 Th3 Th8
41.	Involvement of regional and foreign employers in the definition of key competencies of graduates	W3Th1 Th3
42.	Применение результатов научных исследований при разработке образовательных программ	C1 O8 O9 W2 O9 O11
43.	Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English	S3 O2 O11
44.	Development of mechanisms for the interaction of all subjects of the educational process of internationalization through an integrated information learning system	S3 Th2 Th9
45.	Creation of a base of key competencies of graduates that meet international standards	S2 O1 O2 O4 O5 O6 O10 S3 Th1 Th5 W3 Th7 Th8
46.	Creation of infrastructure to support the introduction of new technologies in teaching, research and management	O3 S3 O7 Th2 Th9 O3
47.	Creation of a new own information resource to neutralize threats during training using DLE	W4 Th9 O3
48.	Creation of a network library with foreign partners	W3 W4 O2
49.	Increasing the amount of electronic content on the university website in English	W4 O3
<i>Teaching staff</i>		
50.	Allocation of budgetary funds for language support of teachers for conducting classes in three languages	C2 O1 O2 Th3 W2 W5

51.	Identification of priority areas for advanced training of the teaching staff, including the development of language competencies and intercultural communications	S1 O2 Y3 W2 W5 O1 Th3 Th2
52.	Providing the university with English-language electronic library resources through cooperation with foreign partners	C2 O2
53.	Providing language support in preparation for entrance exams for master's and doctoral studies	S3 O1 O2 S2 Th1 Th2
54.	Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists	W3 W6
55.	Improving the quality of preparation of articles in English for publication of research results for submission to the international scientific community	S1 S2 O2 O1
56.	Search for new foreign partners to motivate scientific personnel	W1 W3 W4 W6 O2
57.	Search for new sources of funding for the organization of mobility and internships for teaching staff	S1 S2 O2 W4 O1 Y2
58.	Search for new programs and grants for the mobility of teaching staff	S2 Th3 Th2 W1 W4 O1 O2
59.	Application of international practice of creating a support group for postgraduate support and undergraduate study programs	W5 W2 O2 Th1 Th2
60.	Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English	S1 S2 Th2 W1 O2 W2
61.	Creation of an incentive system for teaching staff and scientists to expand international cooperation and form a network of international collaborators	S1 S2 S3 Th1 Th3
62.	Encouraging young scientists to conduct research and obtain doctoral qualifications	S1 S3 O2 Th1 Th2
63.	Encouraging teaching staff and scientists to participate in international projects	W4 Y2 Th3 W1 O2
64.	Increasing the participation of teaching staff and scientists at international seminars, conferences, forums	S2 O2 S1 S2 Th2 Th3 W4 W2
65.	Participation in foreign courses to improve the qualifications of teaching staff on the use of DLE	S2 S1 Y3 W4 W5 Th3 W2 Th2
66.	Participation in exchange programs like Erasmus +, DAAD and Fulbright	S1 S2 O2
<i>Student mobility</i>		
67.	Active involvement of existing foreign partners in academic mobility programs	S1 O1 O2 Th1 W2 W3 O3
68.	Conclusion of partnership agreements with universities from far abroad	S1 O1 O3 Th1 W2
69.	Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university	W2 O2 O3
70.	Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook	W3 Th1
71.	Opening of the official representative office of the university abroad	S1
72.	Improving the quality of technical education in accordance with international standards	W1 O2 O3
73.	Search for international funds for financing educational, scientific and sports student initiatives	S1 O1 W1 Th1
74.	Search for new programs for the organization of academic mobility of students, funded by extrabudgetary funds and funds of the university	S1 O1 O3 Th1 W1 W2 W3
75.	Attracting and supporting international students	S1 W1 W2 W3 O1 O2
76.	Improving the library system in order to increase the availability of available resources for students	S1 O3
77.	Creation of a network library with foreign partners	S1 O3 O1
78.	Creation of a specialized service for communication and interaction with graduates, including those living abroad	S1 O2 O3
79.	Increase in the share of membership in international associations	O2 O3
80.	Increasing the amount of electronic content on the university website in English	S1 O2 O3 Th1
81.	Participation in exchange programs like Erasmus +, DAAD and Fulbright	W2 W3 O1

<i>Collaboration and partnership</i>		
82.	Implementation of research results or applied research in the real sector of the economy	S2 C4 Th1
83.	Resumption of work under previously concluded contracts	W1 O4 O5
84.	Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications	W2 W3 O1
85.	Conclusion of partnership agreements with universities from far abroad	S5 Th2
86.	Providing the university with English-language electronic library resources through cooperation with foreign partners	S1 C5 O2
87.	Organization of postgraduate accompaniment of graduates	S2 S3 O1 O3 O4
88.	Opening of the official representative office of the university abroad	S1 S2 O1 Th2
89.	Search for international funds for financing educational, scientific and sports student initiatives	S5 O1 O3 O4
90.	Search for mechanisms for financing international initiatives, other than at the expense of budgetary funds in order to reduce dependence on republican funding	S1 O4 O5
91.	Search for new areas of cooperation within the educational activities of the university, as well as the provision of specialized services on the basis of existing institutions of the university	S4 S5 O4 O5 S1 S2 S5 Th1 Th2 W4 W1
92.	Search for new programs and competitions for financing collaboration initiatives	W3 O1 O4
93.	Involvement of regional and foreign employers in the definition of key competencies of graduates	S2 S3 Th1 W2 O3
94.	Application of research results in the development of educational programs	W4 O2
95.	Development of an open dialogue platform to attract foreign partners to conduct scientific research and commercialize the results	W1 W4 Th2
96.	Improving the library system in order to increase the availability of available resources for students	S3 O2
97.	Creation of infrastructure to support the introduction of new technologies in teaching, research and management	W4 W2 Th1
98.	Marketing service creation	O1 O4
99.	Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects	S1 S4 Th1 Th2 W4 W2
100.	Creating an action plan with a partner university before concluding a new contract	W3 O1 O2
101.	Creation of a network library with foreign partners	S3 O2
102.	Creation of an incentive system for teaching staff and scientists to expand international cooperation and form a network of international collaborators	W3 W4 O4 W2 O5 Th1 Th2
103.	Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups	S2 B4 O5 S4 S5 Th2 W 1 W4
104.	Increasing the amount of electronic content on the university website in English	S1 O1
105.	Increased participation in international exhibitions	S5 S1 O1 O4
106.	Establishing and strengthening ties with regional and republican industries	S2 S3 S4 Th1 W1 W4 O4 O5
<i>Science and innovation</i>		
107.	Implementation of research results or applied research in the real sector of the economy	S1 S2 Th3 Th4 W5 W7 W8 O2
108.	Conclusion of partnership agreements with universities from far abroad	W1 W10 W3 O4 O1
109.	Translation of the accumulated materials into English for the purpose of publishing them in international journals	S3 S4 Th1 W3 O1 O4 W1 W10
110.	Improving the quality of preparation of articles in English for publication of research results for submission to the international scientific community	S4 S3 O1 4O S3 S4 Th1 S3
111.	Search for international funds for financing educational, scientific and sports student initiatives	W10 O4 O5 O1
112.	Involvement of regional and foreign employers in determining the key competencies of graduates	S3 O1 O2

113.	Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English	Th3 Th2
114.	Development of an open dialogue platform to attract foreign partners to conduct scientific research and commercialize the results	S5 O3 O5 S1 S2 Th2 Th3 Th4 W8 W9 O4
115.	Improving the library system in order to increase the availability of available resources for students	W10 O1 O4 W8 W3
116.	Creation of infrastructure to support the introduction of new technologies in teaching, research and management	W8 W7 O5
117.	Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects	S5 S3 S2 O1 O3
118.	Creation of a network library with foreign partners	W10 O1 O4 W8 W3
119.	Creation of an incentive system for teaching staff and scientists to expand international cooperation and form a network of international collaborators	W10 W9 O4
120.	Encouraging young scientists to conduct research and obtain doctoral qualifications	S1 S2 O2 O1 W4 W8 W9 W6
121.	Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups	W9 W7 Th4 Th3
122.	Increasing the participation of teaching staff and scientists at international seminars, conferences, forums	W2 W10 Th1 Th2
123.	Establishing and strengthening ties with regional and republican industries	W4 W5 W6 W7 O2 O5 W7 Th4 Th3

## APPENDIX J

### Matrix of indicators

№	Indicators
1	Active involvement of existing foreign partners in academic mobility programs
2	Implementation of research results or applied research in the real sector of the economy
3	Resumption of work under previously concluded contracts
4	Allocation of budgetary funds for language support of teachers for conducting classes in three languages
5	Identification of priority areas for advanced training of the teaching staff, including the development of language and digital competencies, intercultural communications
6	Conclusion of partnership agreements with universities from far abroad
7	Ensuring the continuity of curricula
8	Providing the university with English-language electronic library resources through cooperation with foreign partners.
9	Ensuring the constant presence and presentation of the university in the international arena by sending teaching staff and scientists to international conferences, seminars and forums to increase the rating and recognition of the university
10	Providing language support in preparation for entrance exams for master's and doctoral studies
11	Determination of key competencies and skills of readiness for a career of students-future engineers in international companies, preparation of future technical specialists for training in other countries and with the presence of the necessary foreign language and educational outlook
12	Definition of new components of implementation in curricula, taking into account international academic requirements for students
13	Organization of courses on the development of "soft skills" and business administration skills for teaching staff and scientists
14	Organization of postgraduate accompaniment of graduates
15	Opening of the official representative office of the university abroad
16	Translation of the accumulated materials into English for the purpose of publishing them in international journals
17	Improving the quality of technical education in accordance with international standards
18	Improving the quality of preparation of articles in English for the publication of research results for submission to the international scientific community
19	Search for funding mechanisms for educational, scientific and sports student initiatives, in addition to budget funds in order to reduce dependence on republican funding
20	Search for new foreign partners to motivate scientific personnel
21	Search for new sources of funding for the organization of mobility and internships for teaching staff
22	Search for new areas of cooperation within the educational activities of the university, as well as the provision of specialized services on the basis of existing institutions of the university
23	Search for new programs for the organization of academic mobility of students, funded by extrabudgetary funds and funds of the university
24	Search for new programs and competitions for financing collaboration initiatives
25	Attracting and supporting international students
26	Involvement of foreign scientists for consultations on the development of curricula in the framework of partnership agreements
27	Involvement of regional and foreign employers in the definition of key competencies of graduates in order to create a base of key competencies of graduates that meet international standards
28	Application of international practice of creating a support group for postgraduate support and undergraduate study programs
29	Application of research results in the development of educational programs
30	Conducting trainings, round tables, refresher courses, including with the participation of foreign specialists, for administrative workers involved in managing the process of internationalization of the university
31	Development of cooperation with foreign publications and electronic resources.
32	Development of intra-university standards for administrative processes in the field of internationalization
33	Development of an information system that ensures the implementation of internationalization strategies through the creation of a specialized system of digital interaction, including modeling an e-learning space in order to form professional foreign language competence of future engineers
34	Development of corporate management standards

35	Development of a methodology for the language training of university staff and students as a condition for the development of key methodological competencies for teaching and learning in English
36	Development of mechanisms for the interaction of all subjects of the educational process of internationalization through an integrated information learning system
37	Development of an open dialogue platform to attract foreign partners to conduct scientific research and commercialize the results obtained
38	Compliance and development of algorithms for administrative management processes in order to ensure their transparency and interconnection
39	Improving the library system in order to increase the availability of available resources for students
40	Creation of infrastructure to support the introduction of new technologies in teaching, research and management
41	Marketing service creation
42	Creation of a new own information resource to neutralize threats during training using DLE
43	Creation of an open dialogue digital platform for finding potential sponsors / partners in order to participate in key foreign educational events and projects
44	Creation of an action plan with a partner university before concluding a new contract.
45	Creation of a network library with foreign partners
46	Creation of an incentive system for teaching staff and scientists to expand international cooperation and form a network of international collaborators
47	Creation of a specialized service for communication and interaction with graduates, including those living abroad
48	Encouraging young scientists to conduct research and obtain doctoral qualifications
49	Encouraging teaching staff and scientists to participate in international projects
50	Stimulating entrepreneurial activity of teaching staff and students, including for participation in projects to find sponsors for the implementation of start-ups
51	Increase in the share of membership in international associations
52	Increasing the amount of electronic content on the university website in English
53	Increased participation in international exhibitions.
54	Increasing the participation of teaching staff and scientists at international seminars, conferences, forums
55	Establishing and strengthening ties with regional and republican industries
56	Participation in foreign courses to improve the qualifications of teaching staff on the use of DLE
57	Participation in exchange programs like Erasmus +, DAAD and Fullbright.