PROJECT RESULTS:

3.1 Interim Reports

In 2025, an extensive comparative analysis of international models of technology transfer within the university–business–government interaction system was conducted. The study included the USA, European Union countries, South Korea, China, Singapore, and several other economies with well-developed systems of government support for innovation. The analytical database was formed using data from OECD, AUTM, EU Knowledge Transfer Study, WIPO, and materials from university Technology Transfer Offices (TTOs), as well as publications on the institutionalization of technology transfer, digital commercialization platforms, and organizational interoperability.

The methodological approach involved comparing organizational models of TTOs, intellectual property management systems, digital commercialization tools, technology readiness assessment procedures (TRL/CRL/MRL/IRL), public-private partnership mechanisms, and forms of sectoral integration of universities. Additionally, corporate technology transfer portals, cluster model practices, and standardized international technology transfer regulations were studied.

The market-oriented model of the USA demonstrates high entrepreneurial activity of universities, a strong venture ecosystem, and well-developed autonomous Technology Transfer Offices (TTOs), which annually facilitate more than 10,000 licensing agreements. The European model is characterized by high institutional stability, inter-university networks, clusters, and formalized early commercialization procedures. The Asian model (Korea, China, Singapore) is distinguished by systematic government coordination, mandatory industrial validation of technologies, and deep integration of universities into production chains. As a regional comparison, a brief study of Tajikistan was conducted, confirming the crucial role of digital infrastructure and industrial demand.

The comparative analysis showed that the effectiveness of technology transfer is determined by the maturity of infrastructure, standardization of processes, and involvement of all participants in the triad. For Kazakhstan, key directions for adaptation were identified: the creation of an inter-university TTO network, implementation of a “single-window” digital platform, unification of TRL/CRL/MRL/IRL procedures, professionalization of TTOs, development of cross-sector platforms, enhancement of industrial validation, and integration of universities into sectoral production chains.

As part of the project tasks, an extensive collection and systematization of data on international models of interaction between universities, industry, and government in the field of technology transfer was conducted. The analysis included the study of organizational solutions, digital platforms, regulatory approaches, R&D support methods, financing tools, and intellectual property management standards in the USA, European Union countries, Japan, South Korea, China, Singapore, and other innovation-driven economies. The review encompassed materials on government technology transfer centers, corporate and sectoral commercialization portals, regional cooperation mechanisms, and standardized technology readiness assessment models.

The data were systematized according to directions relevant to the structure of international models and the project objectives: organizational structures of technology transfer centers; formats of inter-university and cross-sector cooperation; mechanisms for supporting early-stage research; public-private support instruments; sectoral and cluster forms of interaction; digitalization of technology transfer processes; and approaches to integrating universities into production and innovation chains.

A comparative analysis of the functional units of TTOs in the USA and EU was conducted, including organizational interoperability, integration of digital services, unification of processes for assessing commercial potential, and IP management support. Asian mechanisms of government coordination for R&D, mandatory industrial validation, the formation of TTO network structures, and the implementation of research management platforms were also studied.

Particular attention was given to the analysis of corporate and sectoral technology transfer portals utilizing digital project management models and automation of development evaluation processes. Practices of regional cooperation between universities and industry were examined, based on cluster principles, networked exchange platforms, and joint research programs. Standardized methods for assessing technology readiness (TRL/CRL/MRL/IRL), intellectual property management regulations, and approaches for integrating research data into "single-window" digital systems were analyzed.

In addition to the studied materials, further systematization of international practices was carried out specifically in the context of university–business–government interaction, as reflected in the 2025 analytical report. This section examined the distribution of functions among U–B–G actors, mechanisms for engaging industry at early R&D stages, models of government agency coordination, incentives for industrial participation, and international examples of forming cohesive technology transfer ecosystems. Special emphasis was placed on evaluating the level of industry involvement in university developments, industrial roles in technology transfer, principles of joint IP management, and financing models that ensure the sustainability of triadic interactions.

As a result of the work, a consolidated analytical data set was formed, including:

— a comparative matrix of organizational models of TTOs;

— a registry of digital commercialization platforms and services;

— a typology of financing instruments for technology transfer and early-stage research;

— a catalog of international R&D support programs;

— analytical profiles of international U–B–G practices;

— a review of regulatory and standardized approaches to technology transfer.

The established database provides a methodological foundation for analyzing the applicability of international experience in the context of Kazakhstan and serves as a key preparatory stage for the development of the project's final analytical report.

As a result of the expert review of the interim report, external reviews were received from the following organizations:

1. Review of the interim report on international practices of university–business–government interaction, carried out within the framework of the research project IRN AP26102391, “Models of Effective Interaction between Universities, the State, and Business: Mechanisms of Technology Transfer in Kazakhstan’s Digital Economy”, by Karaganda Technical University named after A. Saginov.

2. Review of the interim report on international practices of university–business–government interaction, carried out within the framework of the research project IRN AP26102391, “Models of Effective Interaction between Universities, the State, and Business: Mechanisms of Technology Transfer in Kazakhstan’s Digital Economy”, by the Russian University of Cooperation, Ref. No. 532/30-10 dated October 10, 2025.

Based on the conducted comparative analysis, an assessment of the applicability of international technology transfer models was carried out, taking into account the institutional, regulatory, organizational, and digital characteristics of Kazakhstan’s university–business–government interaction system. The analysis included a comparison of the structures of technology transfer offices, legal and management mechanisms, digital solutions, forms of industry participation, and financial instruments that determine the sustainability of international models.

The research results showed that elements of North American, European, and East Asian models have varying degrees of adaptability. The high entrepreneurial activity of universities and the professionalization of TTOs, characteristic of the USA, can be adapted partially—mainly in terms of procedures for assessing commercial potential, formation of project-based TTO teams, and the development of venture instruments. European practices demonstrate the greatest institutional compatibility: standardized IP management regulations, inter-university networks, clusters, and digital platforms align with existing initiatives of Kazakhstani universities. Asian models are distinguished by a high degree of government coordination, mandatory industrial validation, and deep integration of universities into production chains—these elements are relevant in the context of sectoral programs and industrial clusters in the country.

The assessment also took into account the results of a diagnostic analysis of the national environment: fragmented regulatory framework, limited business engagement, low digital integration, and heterogeneous organizational models in universities. These factors indicate the need for partial adaptation rather than direct transfer of international solutions.

Key areas with the highest adaptation potential were identified: the creation of an inter-university TTO network; implementation of a national “single-window” digital platform; unification of TRL/CRL/MRL/IRL procedures; development of cluster forms of U–B–G interaction; industrial validation of technologies; strengthening the role of the state as a coordinator; professionalization of TTO personnel; and expansion of venture and public-private partnership instruments.

The findings provided a foundation for designing adapted models in the subsequent stages of the research.

Implementation acts documenting the practical application of the report materials were received:

1. Implementation Act of the research project IRN AP26102391, “Models of Effective Interaction between Universities, the State, and Business: Mechanisms of Technology Transfer in Kazakhstan’s Digital Economy”, Eurasian National University named after L.N. Gumilyov, Astana.

2. Implementation Act of the research project IRN AP26102391, “Models of Effective Interaction between Universities, the State, and Business: Mechanisms of Technology Transfer in Kazakhstan’s Digital Economy”, Chamber of Entrepreneurs of Karaganda Region, Karaganda, Ref. No. 221 dated November 25, 2025.

During the reporting period, analytical materials were prepared, consolidating the results of the comparative analysis of international technology transfer models, systematization of international practices of university–business–government interaction, and assessment of their applicability to the conditions of Kazakhstan. The collected data were structured in accordance with the logic of the research objectives, and conclusions and recommendations for adapting international models to the national innovation system were formulated.

Based on the materials from Sections 1–3, a draft analytical report was prepared, which includes: justification for the selection of international models for analysis; description of methodological approaches; results of the comparative review; assessment of the conditions for applicability of international solutions; identification of priority directions for adaptation; and recommendations for the development of technology transfer infrastructure, digitalization of commercialization processes, standardization of technology readiness assessment methods, and improvement of mechanisms for university–industry–government interaction. The structure of the report is aligned with the project objectives and is designed for use by both universities and innovation management authorities.

During the preparation of the analytical materials, discussions were held within the project working group aimed at refining methodological approaches, agreeing on the report structure, and verifying the completeness of the data considered. Based on these discussions, necessary clarifications and adjustments were made to ensure the consistency of the final version of the document. Using the revised text, key results were incorporated into the publications planned in the work schedule.

The outcomes of the analytical phase will serve as a foundation for the preparation of the project’s final scientific report and for developing recommendations for the advancement of the national technology transfer system.

3.2 Publications for Project AP 19676691:

1. Glazunova S.B., Borbasova Z.N., Daniyarova M.T., Serikova G.S. Models of Organization and Financing of Technology Transfer: Opportunities for Kazakhstan // Bulletin of Kazakh University of Economics, Finance and International Trade. 2025. No. 3 (54). Pp. 63–72.

2. Bezler O.D., Borbasova Z.N. International Models of Interaction Between the Labor Market and Universities: Opportunities for Adaptation in Kazakhstan // Bulletin of Turan University. 2025. No. 4 (108). (Accepted for publication in Issue 4 of the Bulletin of Turan University, with the issue date in December 2025)

3.3 Official Trips

1. Within the framework of Project IRN AP26102391, “Models of Effective Interaction between Universities, the State, and Business: Mechanisms of Technology Transfer in Kazakhstan’s Digital Economy,” from December 7 to December 12, 2025, a scientific business trip was carried out to the Technological University of Tajikistan with the participation of research group members — Alpysbayeva M.B. and Satymbekova S.B. The purpose of the trip was to study international experience in technology transfer and the commercialization of scientific developments.

During the trip, empirical data on the research topic were collected using surveys, questionnaires, and expert interviews. Special attention was paid to analyzing models of interaction between universities, government agencies, and business structures in the implementation of scientific developments into the real sector of the economy.

A working meeting was held with the administration and faculty of the Technological University of Tajikistan, including Nasriddinzoda M.Sh., First Vice-Rector – Vice-Rector for Academic Affairs and Quality of Education; Gaforov F.M., Vice-Rector for Strategy Implementation and Development of Innovative Technologies; Yaminzoda Z.A., Vice-Rector for Science and Implementation; Ikromi Kh.I., Vice-Rector for International Relations; as well as heads of departments: Okhunov B.Kh., Head of the International Relations Office; Nazarov Sh.A., Head of the Academic Mobility Sector for Students and Faculty. During the meeting, issues of institutional cooperation, support for innovative activities, and the development of technology transfer mechanisms were discussed. Expert interviews were conducted, and analytical and regulatory materials relevant to the project topic were collected.

From November 30 to December 10, 2025, Borbasova Z.N. and Glazunova S.B. were on a business trip to Saint Petersburg as part of the implementation of Project AP26102391, “Models of Effective Interaction between Universities, the State, and Business: Mechanisms of Technology Transfer in Kazakhstan’s Digital Economy.”

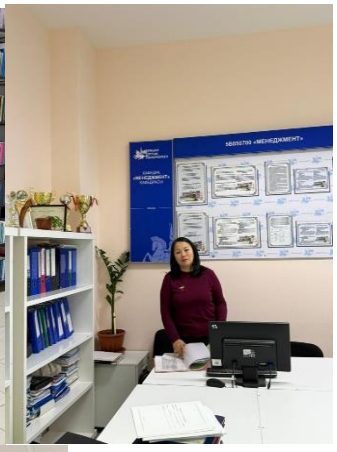
The purpose of the trip was to study practices of technology transfer, the organization of innovative activities, and mechanisms of interaction between universities and governmental and industrial partners.

During the visit program, meetings were held with colleagues from the Department of Economics and Enterprise Management and Industrial Complexes at Saint Petersburg State University of Economics (SPbSUE).

3. As part of the research activities under Project AP26102391, from November 26 to December 1, 2025, a business trip was undertaken by PhD, Professor of the Department of Management and Innovation, Orynbasarova E.D., with the aim of collecting, analyzing, and summarizing empirical data related to the research topic.

During the trip, a working meeting was held with representatives of the Faculty of Economics and Management at Eurasian National University (ENU), during which the schedule of meetings with the Departments of Management and Economics and Entrepreneurship was coordinated, and initial informational and analytical materials relevant to the project’s objectives were obtained.

A meeting was also held with the faculty of the Department of Management at ENU, during which issues of university interaction with government agencies and the business community were discussed. The meeting included a presentation of the research project, expert interviews were conducted, and analytical materials and departmental reports were reviewed.


In addition, as part of the business trip, a working visit was conducted to Astana IT University, where discussions were held with the faculty of the School of Digital Public Administration regarding the development of entrepreneurial activity within the university, mechanisms for the commercialization of scientific developments, and the collection of data on ongoing projects and the digital tools being utilized.

A working meeting was also held with representatives of ENU's structural units overseeing scientific and innovative activities. During the meeting, the digital tools used at the university and their potential application within the framework of the research project were discussed.

Following the business trip, the collected empirical and analytical data were summarized and systematized, and final analytical conclusions were formulated. As part of the research activities, data on international models of interaction between universities, the business community, and government agencies were collected, analyzed, and systematized. Field studies were conducted at Eurasian National University (ENU) and Astana IT University. Based on the results of the research, a scientific article was prepared for publication in the journal Proceedings of the University.