This report presents summary of implementation of the Task Plan for realizing the Competitive Enhancement Program of the Federal State Autonomous Educational Institution of Higher Education National Research Tomsk State University (TSU) among the leading global research centers in 2017 (Task Plan, Program). Over the accounting period, the activity within the program was focused on development of the target model and innovative ecosystem of the university, re-engineering of the learning process, creation and development of the Consortium of Strategic Academic Units (hereinafter, StrAUs), active positioning and reputation management. Openness has gained a special value as a process of continuous exchange of resources and information between the university and the environment and engaging of new stakeholders to the contour of transformation and development of the university.

The main idea of transformation of the university in 2017 relates to the philosophy of management RUN – CHANGE – DISRUPT: RUN – process-based management of the current activity, retaining principles to build and manage a classical university; CHANGE – project management upon implementation of new products and technology, DISRUPT – creation and implementation of new practices, start-ups, and new business models. The combination of control modes RUN – CHANGE – DISRUPT provides the full use of potential of staff and partners of the university. Each mode suggests a particular type of a professional and the level of his/her readiness to changes. Transition of the university control to the combination of three different modes is fundamental for non-linear growth in the future.

Realization of the target model “Genome of the university” relates to the orientation of key processes of the university (production of scientific knowledge, education, and innovations) on basic TSU values that are classicality, fundamentality, and openness relates to the management philosophy RUN – CHANGE – DISRUPT. This transformation allowed focusing the activity of the university and its initiatives, university policies, procedures, and mechanisms of their implementation on tasks to improve the life quality of humans and society and unite the key measures in the Task Plan for realizing the Program.

Events and initiatives, stated in the Plan, are focused on implementation of the key university policies in 2017, including integration of education and science, individualization, and internationalization in education, integration of research groups of the university into the leading international research networks. The key organizational result of implementation of the policies was creation and development of four StrAUs in 2016.

Within implementation of 100 events, 23 tasks, stated in the Plan, faculty and management personnel performs 117 organizational, academic, and research projects, aimed at six key areas of development.

The most significant results to achieve goals of the Program and implementation of the target model of the university are: development of four strategic academic units; reengineering of the learning process; design and implementation of 17 joint Master’s and Postgraduate Programs with international universities; implementation of 57 joint international academic programs; creation of the environment to generate new projects; participation of over 1800 staff in implementation of research, academic, and organizational projects; engaging to the university of 98 leading scientists with the work experience at the leading Russian and other than Russian universities and research organizations for 2017; over 1100 publications in Q1 and Q2 journals for 2017; the overall number of publications in WoS and Scopus databases is over 2300 (five-fold increase since 2013 (464)).

Since 2013, TSU improved its positions in QS World University Rankings by over 200 points (2013: 551–600 range), took 323rd place in 2017/18 and entered QS TOP 100 of the leading BRICS universities (26th place, 4th among Russian universities). In QS World University Rankings: EECA, TSU occupied 11th place (4th among Russian universities). TSU was the 60th in the general list and became the 9th among Russian universities according to Times Higher Education BRICS & Emerging Economies Rankings 2017/18. TSU took 32 positions higher and occupied 217th place and became 4th among Russian universities according to Round University Ranking (RUR). Following results of 2017, the university improved its positions at Webometrics BRICS and occupied 124th place (2015: 153th place).

Specializations of StrAU (Human (Institute of Biomedicine), Society (Institute of the Human of the Digital Era), Physical Environment (Institute of Smart Materials and Technologies), Environment (TSSW: Siberian Institute of the Future)) are focused on research, staff, and technological support of transformation processes of humans and society in the context of the new industrial revolution.

In order to create an effective organizational structure within the university that is the basis for sucesseful development of StrAU 2 strategic sessions with the participation of the experts of the Center for Strategic Research North-West. Development of StrAU happens thanks to its research team that is doing cutting-edge research in the breakthrough areas and is able to produce and deepen scientific knowledge, the team also realizes eductional programs and study modules. The sessions resulted in a better focus on topical research issues and hi-tech market segment. Scientometric analysis of the perspective research topics and areas, analysis of technological markets where products developed by the StrAu would be in demand. Participants of the sessions approved effective organizational structures of StrAU and the model of educational part.

Formation of StrAUs stimulates re-engineering of education and finishes the process of formation of the competitive Bachelor’s and Master’s and Postgraduate education system in a university. Learning process of StrAUs is presented by unique integrated and interdisciplinary autonomous Master’s programs in Russian and English. The module-based structure of the basic academic program, further education programs, distance programs, campus courses, and electives is designed for implementation of the individual academic trajectory.

StrAU Institute of Biomedicine is the center in biotechnologies, providing life quality improvement, active longevity, and development of translational medicine. The leading scientists are involved to work at the Institute: professor Julia Kzhyshkovska (H-index 29), head of the department at the Institute of Transfusion Medicine and Immunology of the University of Heidelberg; professor Valeriy Tuchin (H-index 46), Saratov State University; professor Kirill Larin (H-index 46), University of Houston; professor German Kingma (H-index 23), Maastricht University, professor V. Yarnykh (H-index 31), University of Washigton, and others.

Institute of Biomedicine is focused on unique interdisciplinary academic programs, such as Biophotonics (<https://ihde.tsu.ru/ru/education/biophotonics-ru/>) and Innovations and society: science, engineering, and medicine (<https://ihde.tsu.ru/ru/innov-ru-2/>).

In order to improve efficiency and research quality of StrAU. In 2017, TSU continued to work with the Alliance of Translational Medicine and develop the system integration with Siberian Medical University and academic institutes of the former Academy of Medical Sciences. In May 2017, an inter-university agreement was signed up (TSU, Siberian State Medical University, Maastricht University, the Netherlands) on creation of the first Russian international Public Health Center, research advisor is Klasien Horstman (Maastricht University).

To develop in the field of processing and storage of big data arrays, the Center for Bioinformatics was created at TSU (June 2017). It will serve as an information and analytical hub, uniting capacities of TSU, University of Arizona, and Altay State University in research of oncological and other socially important diseases.

During the development of the key project of StrAU “Extra-early diagnostics and the following therapy of the main socially important diseases, including oncological and cardio vascular diseases, based on the integration and translation of technologies for molecular and cellular biology, nanomedicine, medical imaging, intellectual materials, and bioinformatics” in 2017, a research team of the Laboratory for Medical Material Science of TSU, Institute of Strength Physics and Materials Science, Siberian Branch of Russian Academy of Sciences, and Research Institute of Oncology of Tomsk National Research Medical Center: developed a technology, produced an implant out of porous nanoceramics, performed a cranioplasty surgery to close the defect of facial tissues for the first time in Russia; researchers of TSU and Tomsk National Research Medical Center jointly with colleagues from Heidelberg University and Latvian Biomedical Research and Study Centre won financing for the Alpha-Chit project, which is implemented by support of the Russian Foundation for Basic Research and the international program ERA.Net RUS plus; the grant “Non-invasive qualitative mapping of myelination based on magnetic resonance imaging for clinical diagnostics of neurological diseases and anomalies of brain development” supervised by Vasily Yarnykh, professor at the University of Washington (USA), head of the Laboratory for Neurobiology of the Research Institute of Biology and Biophysics was won; and a research team of TSU jointly with colleagues from Institute of Strength Physics and Materials Science, Siberian Branch of Russian Academy of Sciences completed the project of the Federal Target Program “Research of intercommunication of ion-modified self-expandable stents for peripheral vessels with tissues and liquids of a living organism and creation of an experimental sample of a domestic stent with advanced characteristics”.

Research performance of the StrAU: in 2017, 139 articles were published in reputable journals indexed in WoS and Scopus.

StrAU Institute of Smart Materials and Technologies is positioned as a global research center, providing training of skilled specialists, conduct of research in forecasting at the nano- and meso level of physical and chemical properties of new materials and technological processes based on mathematical and computer simulation with the further transition to the full cycle of research, production, and implementation of smart materials and technologies, including for the markets of AeroNet, AutoNet, SafeNet, EnergyNet.

In 2017, interdisciplinary Master’s (Fundamental and Applied Chemistry) and PhD (Thermal Engines and Power Installations of Aircraft Planes) programs were added to the current package of StrAU programs (<http://smti.tsu.ru/ru/education/>). Partners: FGUP "FCDT "Soyuz", [D.Mendeleev University of Chemical Technology of Russia](https://muctr.ru/). Areas of research activities of StrAUs correspond with the List of critical technologies in Russia and priority areas of development in science, technology, and engineering in Russia relate to solutions of problems of the National Technological Initiative.

Key findings of StrAUs in 2017 are documented as know-hows: the technology of semi-insulating structures of GaAs with diameter of four inches, technology of matrix sensors of a large area (four inches) with the number of elements over 1.5 million pixels, technology of subnanosecond solid state dischargers, commuting the electrical power up to 1 MW for devices of power impulse electronics; electronic component base for ultra-wideband location and reception and transmission at the sub-terahertz frequency band based on photo-conductive structures made of high-resistance GaAs and non-linear optic materials; technology to create devices of organic electronics by the method of molecular layer-by-layer epitaxy; new metallurgic technologies to obtain lightweight casting alloys of aluminum and magnesium, containing nano-sized and high-melting particles of aluminium oxide, detonation nanodiamond, aluminium nitride, scandium fluoride; and new method to obtain geometrically difficult implants based on ceramics for reconstruction of dentofacial area with the use of 3D technologies for each clinical case considering design and the defect length; technologies to obtain new ceramic and metalloceramic composite materials for additive technologies; additive technologies to obtain geometrically-complex products out of ceramic and metalloceramic composite materials with given properties; more than 20 products were developed following  the demand of chemical and pharmaceutical industry in Russia.

 In September 2017, an international forum was conducted in Tomsk, within which an international conference and school “Nano and Giga Challenges in Electronics, Photonics and Renewable Energy (7th Nano and Giga Forum)” was held. There were over 700 participants, 243 were outside of Russia, 55 participants were the leading global scientists from 17 countries and over 300 scientists from the leading Russian research and industrial organizations.

Close connection of the university’s basic principles and creation of an open innovative ecosystem shows itself in collaboration of TSU and the European Organization for Nuclear Research (CERN). TSU produces space muon detectors for the Large hadron collider. In 2017, TSU and CERN extended cooperation in microelectronics and detectors, which TSU produces for the Large Hadron Collider (LHC). In 2017, five young researchers from TSU joined the project of the TSU research team for LHC. They participated in production of the detector and preparation for electronics calibration and tested software to keep results of the analysis in the central database.

The grant of the RF Government was won in 2017 for state support of research, conducted supervised by the leading researchers in Russian educational institutions of higher education under the Decision by the RF Government No. 220 “Experimental research of fundamental symmetries by the Standard model at the Large Hadron Collider” supervised by professor Dmitriy Tsybyshev from the Stony Brook University, USA (H-index: 70).

Performance of the research and academic activity of StrAUs: 248 articles were published in reputable journals, indexed in WoS and Scopus databases; 11 monographs in Russian and other than Russian publishers; the volume of raised funds: 278 million rubles; the volume of royalties of Dectris Ltd (Switzerland): 28.4 million rubles; 24 international researchers were involved in research, 59 researchers from the Russian Academy of Sciences, around 400 of undergraduate and PhD students. In 2017, the following positions were achieved in subject Rankings: QS Physics and Astronomy: 201-250; THE Engineering and Technology: 251 - 300; ARWU Metallurgy: 101+.

Siberian Institute of the Future (TSSW StrAU), specialized in studying Siberia, enhancement of the international academic reputation of the university in a profile research society: the output point for the world to the Siberian region, what allows to create new academic networks with the leadership of the university and to form teams for initiation and realization of the global research projects.

Interdisciplinary Master’s programs of the StrAU includes “Study of Siberia and the Arctic”, “Russian Studies: History and Modern Development of the Siberian Region”, “Eurasian integration”, “Migration Studies”, and “Biodiversity” are designed for interaction between international research networks, such as UArctic and INTERACT, with the leading Russian and other than Russian universities: Moscow State University (Russia), the Institution of Russian Academy of Sciences the Institute of Socio-Political Research RAS (Russia), the Observatory Midi-Pyrenees of the National Research Council of France, University of Sheffield (the United Kingdom), the Cardinal Wyszyński University in Warsaw (Poland), University of Alaska Fairbanks (USA), and others. It is also designed for cooperation with industrial and administrative partners of TSU (administration of the Tomsk region, Khanty-Mansi Autonomous Okrug, Yamalo-Nenets Autonomous Okrug, OAO Gazprom Space Systems, and others).

International interdisciplinary schools were conducted: 3rd Summer Research Workshop School “Science as a life form” based on the TSU research station “Kaybasovo”, paleontological summer school, 4th Summer School “Natural conditions and environment of Arctic and Alpine regions: relief, soils, permafrost, ice caps, biota, and lifestyle of native ethnical groups in conditions of the fast-changing climate”, Summer School “Higher Education and Academic Mobility of the Youth in Modern Integration Processes”, spring and summer schools of Intensive Russian, summer schools in English “Heritage of Eurasia: the Past, the Present, and the Future” and “Teaching in the context of intercultural communication”.

The Siberian network in studying environmental change (SecNet) united researchers for joint study of influence of the global climate changes and the human on ecology of Siberia and Arctic Region. Participants there were large interdisciplinary research centers: Canadian Mountain Network, BioClimLand TSU, USA NEON and Arctic INTERACT. In 2017, new stations were added to the network: observation station “Vasyuganskaya” and station for environmental monitoring in Laos. The unique research installation “The system of experimental bases, placed along the latitude gradient” (mega installation) was formed. It includes four research stations of TSU. Tomsk State University became the only Russian participant, whose three research stations joined the international consortium to perform a large infrastructure project “International Network for Land Research and Monitoring in Arctic – INTERACT” of the research and innovation program of the European Union “Horizon 2020”. In November 2017, 2nd interactive international workshop “Siberia in the global context: Winter conditions and climatic extremums: cooperation in forecasting and adaptation” was conducted under the SecNet network. In 2017, the StrAU became a participant of the international network program of the [International Arctic Science Committee](https://iasc.info/) (IASC) “Multidisciplinary distributed land observations of the Arctic T-MOSAiC”.

In December 2017, the 2nd International forum of university towns was held with the agenda “Enhancement of the university’s influence on development of a city and a region.” University experts from 19 countries, including the Great Britain, Germany, the USA, France, Finland, and Czech Republic, participated in the forum.

Performance of the research StrAU: in 2017, 75 articles were published in reputable journals, indexed in WoS and Scopus databases.

On the basis of StrAU “Institute of the Human of the Digital Era”, interdisciplinary research center in innovative methods for data analysis and machine learning, study of influence of social interaction between people on making rational economic and social decisions in 2017, over 14 research and applied projects were performed: Creation and implementation of the interdisciplinary integrated media for data analysis of social networks to address global challenges of the modern society: design of mechanisms to include data of social networks into the solution of relevant social and socially important issues in economics, education, politics, and healthcare; International research center for human development: longitude research of biopsychosocial factors of early child development; design and approbation of requirements to competences of staff participating in design and implementation of online courses, and others.

Partners of the Institute are: European Association for Digital Humanities (EADH), Russian branch; the University Consortium of Big Data Scientists; international research network for child health and development; Consortium “Accessible Genetics”; Kribrum company (Moscow), Company Group InfoWatch, Kaspersky Lab, and Ashmanov and partners. The team includes the well-known researchers: professor Anatoliy Gershman, Carnegie Mellon University (USA), Konstantin Vorontsov, professor of the Russian Academy of Sciences, Denis Zorin, dean of the Faculty of Computer Science at New York University (USA), Mikhail Myagkov, professor at University of Oregon (USA), head of the TSU research and academic center for prospect research in social and cognitive sciences, and Julia Kovas, head of the International laboratory for interdisciplinary research of individual differences in studying (InLab) Goldsmiths, University of London (the Great Britain), and others.

Three academic programs were added to the academic area of StrAU in 2017. On the basis of the academic office of StrAU, control of the following Master’s programs is conducted: Human Development: Genetics, Neural Science, Psychology; Humanitarian Informatics; Digital Technologies in socio-humanistic practices; Intellectual Big Data Analysis (social sciences); Computer linguistics; Cognitive Linguistics; and Digital Technologies in Publishing. The general set of academic courses of StrAN is created.

Within the StrAU Consortium, the project of the competence center in online learning was designed. In competition by the Ministry of Education and Science of the Russian Federation for allocating grants under the project “Modern digital academic environment in Russia” for 2013–2020, TSU took the 1st place at the category “Creation of the regional competence center in online learning.” Tomsk regional competence center in online learning is open since September 2017 and is actively developing online learning.

In order to focus on the priority areas of development of basic and applied research at the University and to provide support in line with the priorities of the Programme, a competition of research projects of the world-class laboratories and initiative research projects was held by TSU’s a competition of research projects of the world-class laboratories and initiative research projects was held by TSU’s D. I. Mendeleyev Scientific Fund. Total funding allocated exceeded 310 million rubles. A grant competition for academic mobility of scientific and pedagogical personnel, graduate students, young scientists, and students is held quarterly.

As a part of the process of developing the infrastructure and improving the efficiency and research quality, a Center of Excellence in Defense and Provision of National Security was created in 2017; 7 Centers of Excellence continued their work, continuously improving performance and quality of research (http://en.science.tsu.ru/) which in turn lead to an increase in a number of articles produced by the research staff of the university (about 65%). Total number of articles published by the university staff in 2017 was 2300 in Web of Science and Scopus with about 1100 journals in Q1 and Q2.

Web of Science Award in Engineering was presented to Mikhail Sheremet, a scientists from TSU. The Award is given to the most cited scientists and scientific institutions in the world.

In 2017 2 scientific journals published by TSU were included into Scopus database. 9 journals - Tomsk State University Journal of Cultural Studies and Art History, Tomsk State University Journal of Mathematics and Mechanics, Tomsk State University Journal of Philosophy, Sociology and Political Science, Russian Journal of Lexicography, Applied Discrete Mathematics, Rusin, Siberian historical research, Language and culture were included into Web of Science. By 2018 a total of 7 TSU journals were accepted into Scopus and 13 into Web of Science. Information about journals was included into the largest international catalog Ulrich's Periodicals Directory. TSU employees have access to the main electronic data bases (DB Elsevier: ScienceDirect, Illunine8, SciVal, Scopus; DB BCC Research; DB Thomson Reuters Web of Science Core Collection, InCites, Journal Citation Report, Essential Science Indicators, EndNote).

In framework of implementation of plans to conduct research in high-priority international areas of fundamental and applied research, the total amount of agreements that are being implemented and that were concluded, contracts and projects, comprised about 1.5 million rubles. Over 70 % being large-scale contracts and grants.

The most essential scientific-technical projects and grants implemented by the University in 2017 are:

Grants of the Russian Federation Government (4) for the state support of scientific research implemented under the guidance of the leading scientists in Russian educational institutions of higher professional education by the following areas: Earth sciences and related ecological sciences, languages and literature, history and archeology;

Complex projects (1) on creation of high-technological production, the Ministry of Education and Science of Russia;

16 projects that are being implemented under the Federal Special Purpose Programme «Research and developments in high-priority areas of development of science and technology sector of Russia for 2007-2012», the Ministry of Education and Science of the Russian Federation;

Under the state order of the Ministry of Education and Science of the Russian Federation 27 projects were implemented, 14 of them within the basic part, 13 scientific projects were supported as a result of competitive selection of the project part of the state order;

26 projects financed by the Russian Science Foundation (RSF) for a total amount of 121.1 million rubles;

Grants of RFBR and RHSF (132);

Grants of the President of the Russian Federation to support young Russian scientists (young PhD students – 18, young Doctors of Science – 3).

In order to develop outside innovative environment in 2017 the university held joint events with its partners that were also used as communication platforms, the infrastructure was developed; conditions favorable to the implementation of venture projects were created, financial support was lent, active work with Asian markets was undertaken, negotiations with international companies on the developments of Russian companies and universities that are most in demand. In developing the university's ecosystem the following are involved: PAO SIBUR Holding (Moscow), AO Almaz – Antey Air and Space Defence Corporation (Moscow), OAO Corporatsiya "Roshimzaschita" (Tambov), State Corporation Rostec, OAO Academician M.F. Reshetnev Information Satellite Systems, OAO United Aircraft Corporation, OAO United Engine Corporation, FRPC Altai, ZAO RPC Micran, Gazprom Space Systems (Earth remote sensing and communications), Dectris (sensors for synchrophasotrons), StarLine (smart security systems), ASB (educational technologies), Elesy (medical instrumentation), Angioline (cardio stents made of titanium nickelide ), ArtLife (biologically active supplements and food products), leading branches of large corporations like Sibur.

Council of Industrial Partners of TSU plays a key role in setting an agenda in technological development of industry. The members of the Council are: Mirrico Group of Companies, AO Academician V.P.Makeyev State Rocket Centre, AO RPC Micran, PAO KAMAZ, AO Academician M.F. Reshetnev Information Satellite Systems, AO Shvabe, AO Transneft Central Siberia, Group of companies Pharmcontract, OOO ArtLife, OOO Tomlesdrev, AO TVEL, AO SKTB Katalizator, AO Elesy, OOO Tomskneftekhim, AO Sibirskiy Himicheskiy Kombinat, AO FRPC Altai, FGUP "The Federal center for dual-use technologies "Soyuz", AO National Immunobiological Company, Industry Development Fund, OOO NIOST, State Corporation Rostec, AO RPE Radiosvyaz, Russian Federal Nuclear Center All-Russian Research Institute of Experimental Physics. In 2017 an annual meeting with the Council of Industrial Partners of TSU was held. Representatives of 35 Russian and international companies participated in the meeting.

Outside innovative environment of the university realized a new paradigm of innovative activity model in the following areas: innovative infrastructure of the university as a service platform; development and acceleration of complex technological projects (B2B, B2C) for existing and new markets; trying out a new model of a so-called Network University where an entrepreneurship track is introduced into every part of the university community and the students are trained to work in companies that need to be established and promoted into new markets.

In 2017 36 events aimed at developing student technological entrepreneurship were held. 2472 participants included 952 TSU students and staff. Over 5000 participants were registered for various online events (regional accelerator school BiFF (Biotech&Functional Food), project "Student bank" (jointly with AO Gazprombank and OOO Business support team Digital), hackathon "CyberSiberia" (jointly with SiberRussia), hackathon SmartTech AGRO (jointly with KAO Azot) and others). 41 TSU partner took part in TSU events, project expertise or provided mentoring.

A complex program of collaboration with companies that work in high-tech industry and use cutting-edge production techniques is evolving, The collaboration is based on doing joint innovative, research and educational projects with such companies. In 2017 agreements with the following industrial partners were concluded: OOO Company MaksMotors, OOO Di Group, AO SUEK, ZAO Moscow Scientific-Research Television Institute, FGUP Russian broadcasting and warning networks, OOO SPP Russia (C++ company), AO Business support group and OOO Business support Digital, Neuronet Industrial Union for the Development of Technology Market, OOO RVC Infrafund, an agreement with AO Russian Venture Fund was renewed.

Engineering chemical and technological center (ECTC) of TSU in 2017 became one of the first three leaders among such centers operating in Russian universities. Over 50 new products of ECTC were commercialized between 2014 and 2017. More than 20 products were developed following the demand of chemical and pharmaceutical industry in 2017. ECTC asset turnover equaled 100 million rubles. Among 85 partner enterprises of ETCT such large companies as: SIBUR, KAO Azot, FKP Kamenskiy, OOO Novohim Trading, ZAO VladMiVa, OOO Krezol, ZAO Research and Production Company Mikran and others,

In 2017 TSU jointly with AO Elesy continued work on a complex project on development of high tech production under the Russian Federation Government Decree №218 "Development of a domestic high tech software and instrumental complex to implement technological processes management system based on free software". Total investments into the project was 300 million rubles, 50% of the total amount was invested by ZAO Elesy itself.

The first in Russia University venture fund was established at TSU in 2017 jointly with RVC Government fund of funds Development institute of the Russian Federation. The University Venture Fund is managed by Di-Group Holding. Amount of funds of the venture fund is 33 million rubles. (25% belong TSU and 75% belong RVC). Maximum amount of investments into the project is 8 million rubles. Resources of the Fund are allocated to support projects in the following areas: NeuroTech, IoT Medical, 3D-printing, AR/VR/MR, Wearable, Mobility. In 2017 TSU staff members submitted 4 project for a competition of the Venture Fund.

Number of small innovative enterprises (SIE) with TSU participation increased from 38 to 43. 37 of all the SIE were established under the Russian Federation Government Decree 2017: OOO Cifronomika and OOO Alrekom began operations in 2017, establishment of another 3 SEI is undergoing an approval process with the Supervisory Board of TSU. SEIs completed 32 projects for a total of 90 million rubles. Total revenue was 136.9641 million rubles and 117 TSU staff members and students were involved in work of SEIs.

TSU is the fourth is Russia by the number of electronic applications for inventions and utility models. In 2017 89 patents and 8 know-how were received, 11 license agreements and 3 alienation agreements were concluded. The sum of royalty in 2017 came to 35.6 million rubles in 2107.

TSU was a strategic partner of a nationwide conference "Gorod IT". During this major IT event of the year, a number of agreements between TSU, Userstory, Gorod IT, Tomsk alliance Smart City and Smart City cluster in Casablanca (Morocco) was signed. The agreements were aimed at improving living standards of the citizens.

The commitment of TSU to creation of an innovative university system is realized in the arrangement of conditions for the development of a globally competitive regional model of the rapid innovative, technological and social development. In 2017 TSU won a competition on developing university centers of innovative, technological and social development of regions. The program of transformation of the National Research Tomsk State University into the University Center for Innovative Development of the region is focused on involving the university in the agenda of regional development as an effective partner of the authorities and companies of the regional economy in solving the tasks of regional development until 2025. The tasks include ensuring sustainable economic growth of the region, scientific and technological development and enhancement of the global competitiveness of Tomsk region economy.

Institute of Economics and Managemen (IEM)t facilitated effective development of innovative ecosystem, formation of entrepreneurial culture and innovative and entrepreneurial track as a part of education at TSU. Among IEM partners are: Sberbank, international companies EY, KPMG and others. In Spetember of 2017 the Academic Board of TSU decided to include courses on technological and social entrepreneurship into every educational program starting in 2018 academic year.

IEM hosted the following guests with lectures: the rector of the corporate university of Sberbank Valeryi Katkalo, poitical expert Petr Schedrovitskiy, Executive partner PwC in Russia Igor Lotakov, professor of entrepreneurship and finance of a Swiss business school IMD Benoit Lelu, honorary professor of HEC Paris Jean-Paul Larcon, general director of IBM in Russia and CIS Andrey Filatov, professor of the Delft University of Technology (Netherlands) Johan Wissema.

The first group of students of a joint program MBA-Agribusiness run jointly with the Wageningen University graduated in 2017.

The first meeting of the Advisory Board of IEM was held in 2017. Members of the Board are the representatives of the leading international companies, business schools, research centers and development funds from Russia, France, Switzerland, Netherlands, Belgium and the US.

Several educational programs are realized within the IEM. PBL is the main educational technology. A program that is based on PBL is realized in partnership with Maastricht University. The length of the program is 3 years (2017-2019). 15 students already received the certificates as they finished the first part of the program, The second part starts in January 2018.

Stakeholders (high tech innovative globaly oriented companies, leading international universities, world-class researchers) are actively involved into the transformation processes of the university. In 2017 integration of the educational units was done with active participation of the stakeholders: a Research and Educational Center "Higher school of Journalism" was opened (Faculty of Journalism, Department of Social Communication of the Faculty of Psychology, Communications Policy Division, in partnership with TASS and large regional mass media: ) RIA Tomsk, State TV and Radio Broadcasting Company Tomsk, television company Tomskoe Vremya); Institute of Applied mathematics and computer sciences (Faculty of Applied Mathematics and Cybernetics and Faculty of Informatics). Faculty of Philology and Faculty of Foreign Languages negotiated creation of a Research and Educational Center "Modern languages and literature".

Main goals of the integration of educational structures are creating responsibility centers in every research and educational area, improving education quality, eliminating duplication of functions.

Re-engineering of education was based on core principles of education at TSU: integration of science and education, personalizing education and talent development, and internationalization. Re-engineering process included developing new approaches to content, educational technologies, and managing educational process. Re-engineering of education is based on a target model of the university and a graduate. Target model of a graduate is a harmoniously developed individual, inclined towards self-improvement, able to act beyond and above professional boarders and to construct a new technological and social reality in improving living standards of people living in postindustrial society.

To implement the policy that ensures individualized educational trajectories of students the development of campus courses has been continued. The courses consist of lectures and seminars on various topics that students of any faculty can study in addition to their main educational programs.

A catalog of campus courses is presented on TSU main website (www.cdeq.tsu.ru/courses) and includes 71 subject including courses designed by employers and courses in English. In 2017 1988 students both from TSU and from outside were enrolled in campus courses of TSU.

High quality of education is confirmed by international and public accreditation. 5 Master's programs were accredited in 2017.

Tomsk state university took part in organization of a new large-scale olympiad “I am a professional” for students of various majors together with the Russian Union of Industrialists and Entrepreneurs, “Business Russia”, and the following universities: Higher School of Economics, The Russian Presidential Academy of National Economy and Public Administration (RANEPA), MIPT, ,Sechenov University, Moscow City University, ITMO University, Peter the Great St.Petersburg Polytechnic University, Ural Federal Unviersity, University of Tyumen. In 2017 TSU is the organizer of the olympiads in the following subject areas: Biotechnology, Psychology, Ecology, Geology; a co-organizaer for Journalism, Sociology (Higher School of Economics), Photonics (ITMO University), Mathematics, Physics (MIPT), State and municipal management, Management (RANEPA).

TSU students won in the following subjects: Psychology, MA (gold), Geology, BA (silver), Ecology, MA (silver), Ecology, BA, MA (bronze).

Promotion of educational content of the university in the global arena and development of electronic educational environment at the university are also connected with the development of on-line projects of TSU. Development of on-line courses is realized on a competitive basis. In 2017 16 on-line courses were developed and an on-line specialization Presentation Skills: Speechwriting, Slides and Delivery». In September 2017 16 on-line courses of TSU were launched on a National platform "Open Education" (openedu.ru). In 2107 MOOCs developed at TSU were launched on OpenProfession ([https://courses.openprofession.ru](https://courses.openprofession.ru/)) and Stepik (<https://stepik.org/catalog>). In 2017 on-line courses of Tomsk state university became available on one stop on-line portal. (<https://online.edu.ru/ru>) The portal was developed within the framework of a priority project "Modern digital educational environment in the Russian Federation". Altogether 45 MOOCs were developed at TSU since 2014. Individuals from 178 countries including Russia, the US, Germany, Spain, Italy, France, Great Britain, Israel, Poland, Czech Republic, Mexico, Canada, South Africa, Kenya, Morocco, China, Ukraine, Kazakhstan, Belorussia and others. Since the start of the project over 180 thousand people registered for TSU MOOCS (over 88 thousand people joined in 2017).

In 2017 Tomsk regional center for on-line learning (TRCOL) was created with its headquarters located at TSU. The Center works on developing on-line learning at higher educational institutions and secondary vocational educational institutions. The Center has 4 partner universities (TSU, TPU, TUSUR, SMU) and the Department of professional education of Tomsk region. In 2017 TRCOL developed 8 professional development modular programs in on-line learning and using on-line technologies (5 programs are realized by TSU, 3 programs realized jointly with partner universities) <https://pro-online.tsu.ru/edu/specialist/>). 286 employees from 63 organizations representing all levels of education and 22 regions of Russia and Kazakhstan studied at TSU on programs devoted to on-line technologies.

In the period of 2013 – 2017 35 programs of further professional education were developed and launched jointly with the leading Russian and foreign universities and/or Russian and foreign research organizations. In 2017 5867 individuals studied on these programs.

There are 2 English language clubs with over 500 participants that operate within the project of creating an English environment on campus. The clubs are open for public. Campus infrastructure in English is being developed, there is a testing system in place for staff members that allows them to test their level of English. English courses are available to administrative and academic staff. A Center of Academic Writing provides proofreading and proof listening service to students and academic staff, and courses on Academic English. There is a Language Support Center, three Translation Centers in Socio-humanistic, physical and mathematical and natural sciences. According to a large scale research performed by the Russian international affair council TSU became one of the three universities leading by the quality of English version of their websites.

In 2017, 14 summer and winter schools were organized at TSU for students and graduate students from the leading international universities. Students from 21 countries participated in short-term educational programs.

351 TSU students participated in student academic mobility programs. They studied and undertook internships in over 20 different countries.

17 joint programs with foreign universities were developed and launched. In general, 57 joint international educational programs were realized with 166 students from 14 countries studying on them. These programs include 17 double-degree programs, 7 PhD programs with two academic advisors and 25 student exchange programs. The opportunities for student exchange are growing. In 2017 student exchange agreements were signed with Saxion University of Applied Sciences, Netherlands; University of Santiago de Compostela and Regional University of North-Western Rio Grande Do Sul, Brazil. With the support Erasmus+ such agreements were signed with the Free University of Brussels, and EISTI, France.

Institute of applied mathematics and computer sciences admitted students to the renewed program of Software Engineering. The Institute drew on experience of MIT and Stanford University which are leaders in training IT professionals and adapted it to the Russian realia. The group consists of Russian and international students. International students are taught in English.

TSU became a member of Consortium of universities-exporters of Russian education. The creation of the Consortium was initiated under the priority project "Export of education" of the Ministry of Education and Science of the Russian Federation.

TSU became a member of a project "Institutional partnership in Trans-Regional Environmental Awareness for Sustainable Usage of Water Resources: Russia and Kazakhstan". The project was supported by ERASMUS+.

The system of grant support of international students was actively being developed. «TSU international students grant» was established to attract talented students from abroad to study at TSU and to support the ongoing formation of multicultural environment.

As a part of internationalization of the postgraduate school, 8 programs in English were created and are being implemented. An already traditional grant competition "PhD Scholarship TSU" for prospective postgraduate students from countries other than Russia who want to study at TSU in 2017-2018, was held. 117 postgraduate students from Egypt, Iran, Saudi Arabia, Algiers, Pakistan, Tanzania, India, Vietnam, China, Mongolia, Italy, Poland, Yemen, Bangladesh, and Laos study at TSU.

Total number of international full-time students is 2184. The share of international full-time students is 18.34% TSU entered the five leading universities of BRICS by the index of international students.

Within TSU there is a Pre-courses Department working towards teaching the Russian language and further admission to TSU’s bachelor’s and master’s programs. In the frame of these objectives the department ensures teaching the Russian language as foreign and training applicants in humanities (history) and natural science (mathematics) for further entrance examinations and study for bachelor’s and master’s degrees. In 2017 80 students from 17 countries successfully mastered the program for admission to the Russian universities and received certificates the Pre-courses Department.

TSU has become the only Siberian university which is authorized to hold independent exams in the Russian language for foreigners and issue State-recognized certificates.

Within the purpose to ensure early identification of bright research-oriented applicants and formation of the “target applicant”, TSU implements networking projects in partnership with institutions of general secondary education in Tomsk region and Siberian Federal District. A network of TSU partners was formed including the Regional center of educational development, intermunicipal centers of talent development (9), the Department of general secondary education of Tomsk region, 32 educational institutions authorized to be regional centers for innovations, schools (100) – TSU’s pilot offices for developing and implementing joint programs of oriented instructions and methodical offices of municipalities.

In 2017 TSU’s Internet-liceum at the basis of five remote technologies ensured teaching in 81 programs in five distance schools for gifted children. 10110 pupils from more than 40 Russian regions as well as Kazakhstan, accessed these programs. The interactive environment on TSU’s school portal “Universitetsky prospekt” was regularly used for training 299 teachers of Tomsk region, Siberian Federal District, The Commonwealth of Independent States and teaching 1983 upper secondary education students. In total, 6,437 pupils participate in projects and campaigns organized on TSU’s school portal.

In collaboration with partner schools, six network educational programs were developed and tested. The programs are focused on developing additional skills and gaining experience in project and research activity: “Business and leadership”, “Formula of creativity”, “Opened TSU’s STEM-class”, “Liberal arts”, “Vision of the future”, “Introduction to design”. In 2017 more than 250 teachers, 3,000 students from 65 Tomsk schools, 100 TSU’s students and teachers were involved into testing of the system.

In 2017 the Centre of Science competitions was established. It is aimed at holding attainments, training sessions for gifted students and personal recruiting. For 2017 TSU have held 10 interuniversity Olympiads on 12 subjects and 5 interdisciplinary directions. The events involved 28,767 pupils from 20 regions of the Russian Federation. Among them 1,557 were awarded as winners and runners-up. Thanks to the Centre of Science competitions in 2017 TSU admitted 77 winners and runners-up of Olympiads having proved their success by high performance at State exams. (in comparison with 2016 – 28 entrants and 2014 – 14 entrants).

In 2017 TSU leveraged its federal partners’ resources for work with gifted children. In collaboration with charitable fund “Lift to the future” (created by a Russian charity foundation AFK “Sistema”) engineering-construction design workshop was organized. It involved 90 seniors from 17 regions of the Russian Federation. In 2017 collaborating with the All-Russian Association of economic cooperation TSU hosted olympiad on technological prospects having attracted 7, 000 s pupils coming from 21 regions of the Russian Federation and three neighbor countries. In partnership with fund “Talent and success” and center “Sirius” TSU launched program “Lessons of the Present”, trained students for working with gifted children and developed network program of master courses. An agreement was concluded with “Rybakov fund” on implementing joint project “Design laboratory of equal-rights environment”. In Yaroslavl during all-Russian forum “Future intellectual leaders of Russia” (and federal portal “ProeKTOria”) for the gifted youth TSU delegation presented its vision how to work with talented school students.

TSU developed a technique for identifying pupils’ educational interests and gifted school students on the basis of their available user data in VKontakte using various methods such as content-analysis, statistical analysis, traditional methods of psychological diagnostics, mathematical statistics, machine learning. There were 12,600 accounts VKontakte.

TSU’s internationalization strategy developed with the help of QS consulting group is based on promoting multicultural environment at the university, TSU’s participation in associations and partnerships, collaboration with foreign research and educational centers. According to this strategy, in 2016 TSU set target countries for possible cooperation: Central Asia (Mongolia, China, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan), South Asia (India, Pakistan), South-East Asia (Vietnam, Laos, Malaysia, Indonesia, Singapore). In these countries TSU implements the policy aimed at promoting the Russian language and culture and acts as a coordinator of the Association of Russian and Indian universities.

In 2017 TSU hosted the second meeting of presidents of the Association of Russian and Indian universities. The meeting united 18 leading Russian and Indian universities. The key subject was collaboration in development of “smart cities”, improvement of eco-system and living conditions for humans.

In the course of 2017 TSU’s professionals were providing training the Russian language courses for schools and university teachers (totally 82 specialists were trained) in Hanoi (Vietnam) as an element of the Russian Language Week. In November, 2017 in Hanoi TSU set up II International forum “Russian education system within the Eurasian context”. In the framework of this forum there were numerous meetings with ministers of the Laos government and the management of National University of Laos; recruiting campaign was arranged.

Understanding agreements were signed with Indonesian universities: Sepuluh November Institute of Technology, Udayana University, Padjadjaran University, Pattimura University. In July, 2017 the delegation from Pattimura University led by Rector Dr. Marthinus Johannes Saptenno visited TSU.

In 2017 Rector of TSU participated in the First meeting of the Association of Classical Universities of the Russian Federation and the People’s Republic of China. Confucius Institute of TSU (CI TSU) is the one center in Russia that is recognized by the Confucius Institute Headquarters as one of the most effective and entered top 20 among 500 Confucius Institutes worldwide. In 2017 it comprised 900 students.

In 2017 TSU hosted more than 100 international events, received 20 foreign delegations, over 400 presidents of foreign universities, scientists, teachers, politicians, diplomats, officials.

In order to promote TSU’s educational programs and recruiting of possible applicants for 2017-2018 academic year, TSU has participated in education exhibitions: EAIE-2017 (Seville, Spain), the II international forum “Russian education system within the Eurasian context” (Vietnam and Laos), international education conference “World Education Expo Indonesia” (Jakarta, Indonesia). For recruiting foreign students TSU’s representatives held a series of retreats in China, Laos and Vietnam.

In 2017 TSU signed 30 contracts with various foreign institutions like Pattimura University (Indonesia) and the Ministry of ecology and natural resources of the Lao PDR.

In 2017 1,044 TSU’s employees participated in programs of mobility including 47% - young specialists (491 employees) who benefited from 274 training courses – 166 in Russia and 206 abroad – and participated in 770 conferences comprising 670 scientific conferences, 599 in Russia and 171 abroad (49 countries).

TSU’s activity for 2017 was focused on improving governance, engaging staff into transformation process and governance, introducing matrix management along with elements of shared governance; developing internal communication processes; changing corporate culture.

TSU regularly compares and studies the best experience of university governance from all over the world. TSU’s managing staff visited a number of universities in China, Japan, Vietnam, Laos, France and Germany. In April, 2017 TSU’s delegation led by Rector participated in the IV Forum of Presidents of humanitarian universities and heads of humanitarian departments of Russia and France (“Russia-France: dialog and trust in the educational space”), in September, 2017 the delegation studied the best experience of university governance in Steinbeis-Hochschule (Germany). These meeting resulted in extending cooperation agreements, working out proposal on enhancing cooperation, developing training systems including on-line one and new projects.

In May, 2017 the Second Symposium “University models within Russian education system” took place. It united presidents of the leading universities and ministry representatives.

The experts from The Moscow School of Management SKOLKOVO (headed by Mr. Andrey E. Volkov) held 3 strategic sessions, arranged ongoing activity of thematic groups including key leaders, heads of research and teaching staffs, young teachers and researchers, students (over 400). The groups ar focused on developing support system for quality and services of the university, policy-making and its implementation. As a result, 4 transformation projects elaborated during the sessions were approved by the Managing committee for promoting competitiveness of TSU. The projects were launched in 2017.

The program of extending TSU’s leading staff’s managing skills is being implemented. The project led by an expert at changes management Mr. O. Alekseev is being carried out. During 2017 15 seminars have been arranged.

In order to increase research and teaching staff’s personal motivation, innovative environment permanently supporting change management is being formed. For 2017 more than TSU’s 1,500 employees have participated in key communication events, meetings with specialists of departments, laboratories, strategic sessions, the Board’s open meetings and open seminars. Over 1,00 employees are involved into the projects. In addition to that, TSU encourages its research and teaching staff to benefit from innovations via competitions and grants as well as through collecting and expanding the bank employees initiatives the crucial development programs. In 2017 the fourth grant competition was held. 17 application out 52 were approved. These projects focused on expanding the best experience of teaching and research activities are being implemented. Since 2013, 80 proactive projects have been carried out. They united over 1,900 TSU’s employees and students.

Another way to involve employees is to participate in events devoted to setting up resource base of the research and teaching staff and managing staff on the basis of talent management. In this respect, individual growth plans have been worked out; activities for skill development have been held including lectures and seminars devoted to contemporary researchers’ publication activity, development of managing skills, English lessons. In addition to that, it was ensured that the reserve staff would participate in TSU’s events.

The list of traditional events at TSU has been added by an international scientific and practical conference “HR-TREND 2017: Talent management. Team building for development” devoted to the corresponding issues in 2017. The conference united 400 participants and over 60 speakers. Its objective is to form a research and practice community working for prominent staff development.

The system of divided governance is developing. In 2017 50 boards and commissions continued functioning in various directions, they counted over 1, 100 specialists from research, teaching and managing staff. In 2017 5 meetings of the Supervisory Board were held which resulted in decisions on over 30 issues.

The target model of representation and development of communication processes comprised information support of the Program aimed at involving teachers, other employees and students into organizing events, enhancing internal cooperation for achieving TSU’s global objectives, image-making as a leading research, education and innovation center.

Websites of partner universities contain information about TSU’s employees having participated in TSU events as well as direct links to its site. TSU’s presentation website is available in three languages: Russian, English and Chinese. For 2017 their audience has increased by 11%. 280 news messages were published on the English version, 423 - on Chinese one. For a year 24, 304 materials about TSU were published and displayed in mass media: 14,067 - in regional, 9,476 - in federal, 761 - in foreign. Information about TSU was published in many Russian and foreign periodicals: “Forbes”, “The Village”, “Rossiyskaya Gazeta” (Russian: “Российская газета”), “Vedomosti” (Russian: “Ведомости”), “Russkiy reporter” (Russian: “Русский репортёр”), “RBK Daily” (Russian: “РБК Daily”), “Izvesiya” (Russian: “Известия”), “Expert” (Russian: “Эксперт”) and others. TSU cooperates on the permanent basis with news agencies including “TASS” (Russian: ТАСС), “Interfaks” (Russian: Интерфакс), “RIA Tomsk”(Russian: РИА Томск). Over 600 movies were broadcasted by TV and radio channels: “First Channel” (Russian: “Первый Канал”), “Russia 1” (Russian: “Россия 1”), “Russia 24” (Russian: “Россия 24”), “Leningralskoye televideniye” (Russian: “Ленинградское телевидение”), “Obshchestvennoye Rossiyskoye Televideniye” (Russian: “Общественное российское телевидение”), “Radio Rossii” (Russian: “Радио России”), “Russkoye Radio” (Russian: “Русское радио”), “Radio 7” (Russian: “Радио 7”), “Radio Cultura” (Russian: “Радио Культура”).

TSU is largely represented in social networks: VKontakte (28,580 followers); Facebook (4,000 followers), Twitter (2,800 followers), Instagram, Youtube in Russian and English; on Chinese social sites QQ (app. 3,000 followers), Wechat, Weibo. The active audience increased by 17%. TSU’s Internet communities appear in materials of the Ministry of Education and Science of the Russian Federation, Project 5-100, “Vesti Nauka” (Russian: “Вести Наука”), “TASS Nauka” (Russian: “ТАСС Наука”), “Study in Russia”, partners and industry media.

Internal communication processes are intensified with the help of university newspaper “Alma Mater”, thematic mails, organizing PR-campaigns.

Within the transformation project of TSU’s campus for the purpose of arranging modern environment focused on a new content and education technologies as well as interdisciplinary cooperation among students. In 2017 a new building of Institute of Economics and Management, TSU Research Library got an iMac-class as a result of joint project implemented by TSU Research Library, IT-Division, Faculty of Innovative Technologies and company Space-O Technologies specializing in developing mobile apps. In addition, during 2017 site improvement of TSU’s territory has been carried out. The project aimed at arranging “third space” - places destined for communication, group work and collective creativity - was continued. Students won the fourth competition for proactive projects and arranged co-working space in dormitory 8. In six dormitories public places were improved, 29 classrooms in 7 TSU’s buildings were repaired, two dormitories got new canteens.

TSU started construction of a new dormitory. The building of over 21,000 square meters will consist of two structures: 15 and 12 floors. The dormitory will be able to accommodate up to 800 students.

In 2017 functionality of the mobile guide “TSU. Helper” for students residing in dormitories was expanded. The team of a proactive project developed a GPS-system for social communications and coordination “Mobile campus: pocket university” using geosocial service “Fourssquare Swarm”.

In 2017 the II International forum of university cities “Energy of a university for city and region development” arranged by TSU supported by Tomsk Oblast Administration, the Ministry of Education and Science of the Russian Federation, the French Embassy in Russia and the German Consulate General in Siberia. The key issue of the forum in 2017 is to increase TSU’s influence on development of digital economy and social sector of regions, partnership of authorities, business structures and university in order to face social, urban and economic challenges. Head of top universities, representatives of authorities and business from 25 countries met to discuss possible ways of university transformation into innovation centers contributing to economic and social development of regions.

Within implementation of the third role of the university, open access for Tomsk residents and visitors is provided to infrastructure facilities of TSU: Research Library, Botanical Garden, TSU Cultural Center (concerts of TSU Chapel Choir, TSU Violinist Ensemble, Jazz band TGU-62), and TSU sports building. Upon conduct of events “Noch muzeev-2017” and “Den Tomicha”, over 9,000 of citizens attended university museums. The educating project “Open University” is continuing and developing within informal learning. It encourages development of social partnership of the university and growth of its authority in Tomsk. Over 6,000 citizens took further general education programs. TSU entered Association International Universités du Troisième Âge (AIUTA).

TSU’s museum campus and the Research library’s exhibition halls have arranged their communication with potential audiences including preschool children, pupils, TSU’s and other institutions’ students, guests. In 2017 TSU’s museums provided 1,145 events (excursions, museum classes, awareness-raising activities which involved 27,198 visitors.

In 2017 the quality of TSU’s publications in data bases WoS and Scopus was over 2,300 which is five times more than in 2013. Besides, TSU became ranked 200 positions higher in the international list QS World University Rankings since 2013. These considerable results indicate that TSU is moving to a new stage.

The target model of TSU’s image as a modern classical university is being improved. It is effectively manifests through managing policies and techniques and serves a platform for sustainable promotion of TSU in the global academic community, for increasing its performance indicator and international recognition of its attainments.