

Ministry of Education and Science of Russian Federation

**INTERDISCIPLINARY  
RESEARCH AND EDUCATION  
SOUTH URAL STATE UNIVERSITY STRATEGIC ACADEMIC UNIT  
"SMART EDUCATION"**

Moscow, 2017

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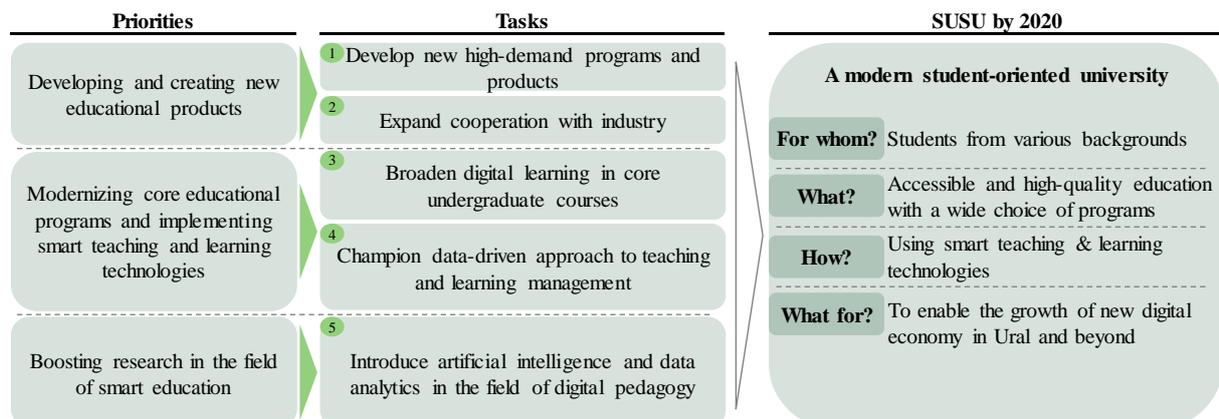
## I. Executive Summary



### The StrAU's objective

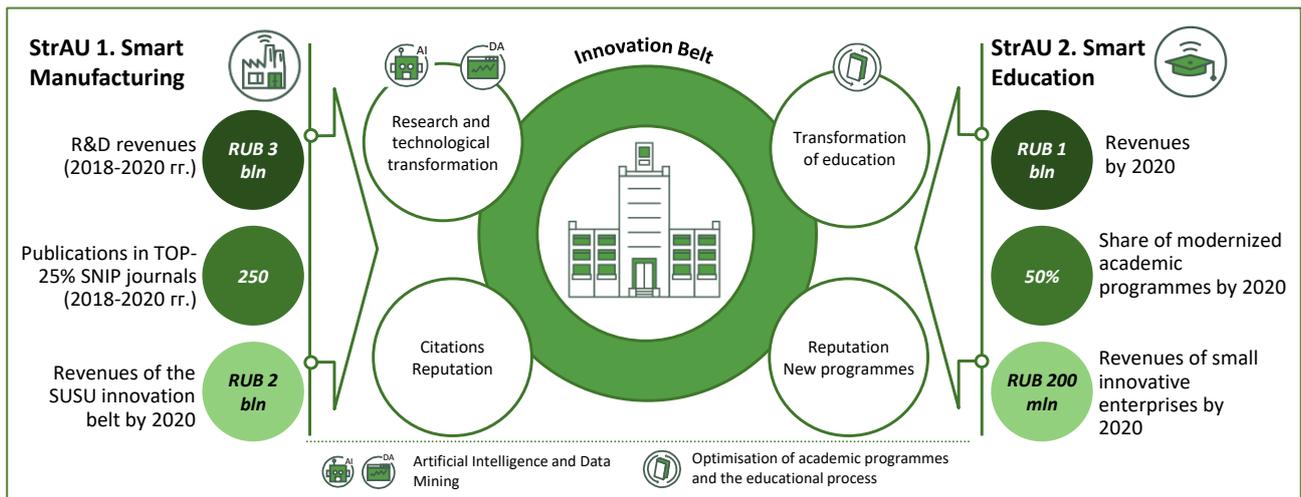
To transform SUSU into a student-oriented university where students from various professional and educational backgrounds can find a wide range of curricula based on modern teaching technologies. The StrAU will ensure the advancement of the university in the international QS and THE rankings by improving its academic and employer reputation.

Challenges	Description
<b>Democratisation of knowledge</b>	The dynamic development of open-source materials encourages universities to change their educational approach and business model
<b>Contestability of markets and funding</b>	There is increased competition due to decreasing budgetary support and changing demographics
<b>Digital technologies</b>	Digital technologies are radically transforming not just how education is accessed and consumed, but also the way 'value' is created by public and private providers of higher education
<b>Global mobility</b>	Students, teachers and universities are becoming more mobile, which increases the competitiveness of the domestic education markets and creates opportunities for international activity
<b>Industry integration</b>	Business is playing a bigger role in the education sector as a partner and competitor of universities



### Results

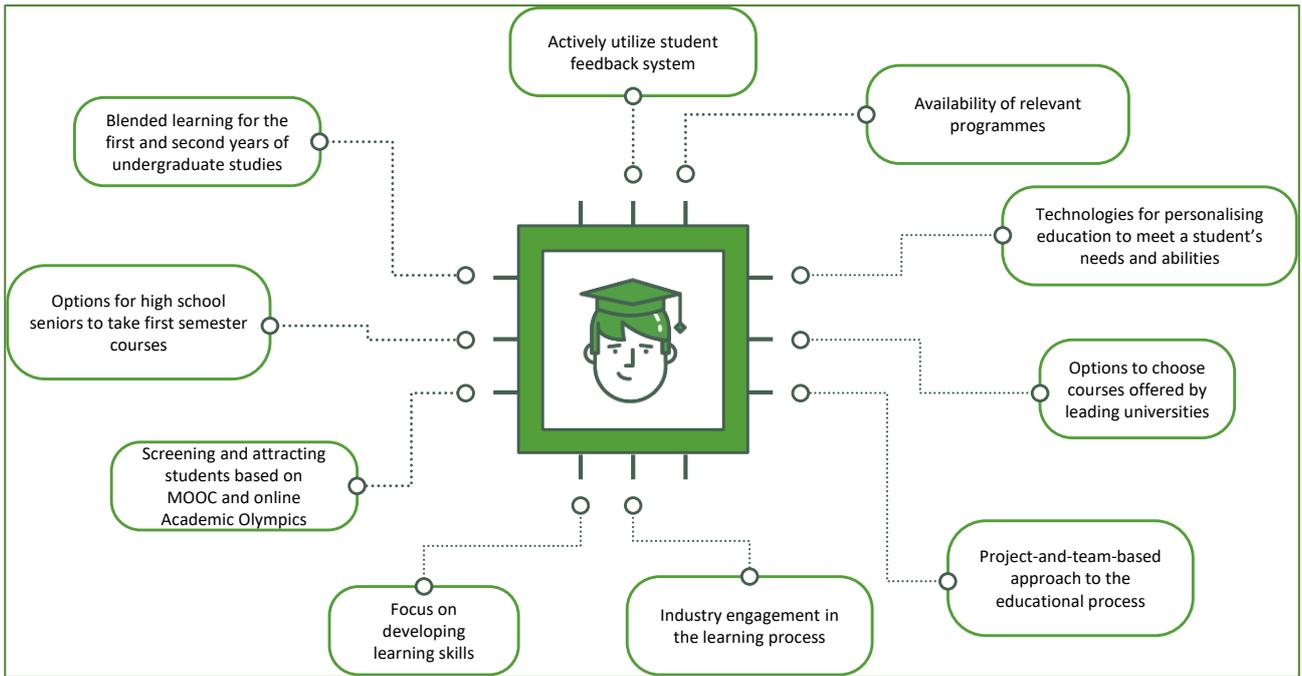
- RUB 1 billion revenue by 2020 from e-learning based programs
- Up to 50% of the curricula transformed into e-learning based format
- Smart education is established as a new field of research at SUSU
- National leadership in implementing smart learning and teaching technologies
- Up to RUB 200 million revenue of new ventures in smart education sector



The Strategic Academic Unit (StrAU) on Smart Education is one of two StrAUs at South Ural State University (SUSU). The synergy from the Smart Education and Smart Manufacturing StrAUs ensures the **development of an innovation-driven community** in the Greater Urals, improving the competitive performance of the Russian economy. SUSU's departments at the core of Smart Education demonstrate sustainable financial model, earning around RUB 300 million per annum through extensively employing digital education technologies in 40 e-learning and blended learning courses.

StrAU Smart Education delivers significant social impact by providing education for those who need it most and have no access to other, more traditional forms of it, such as people with disabilities, military personnel and young mothers. The university is implementing a number of large scale distance learning projects in collaboration with the Federal Penitentiary Service of Russia, the Chelyabinsk Eparchy of the Russian Orthodox Church, etc.

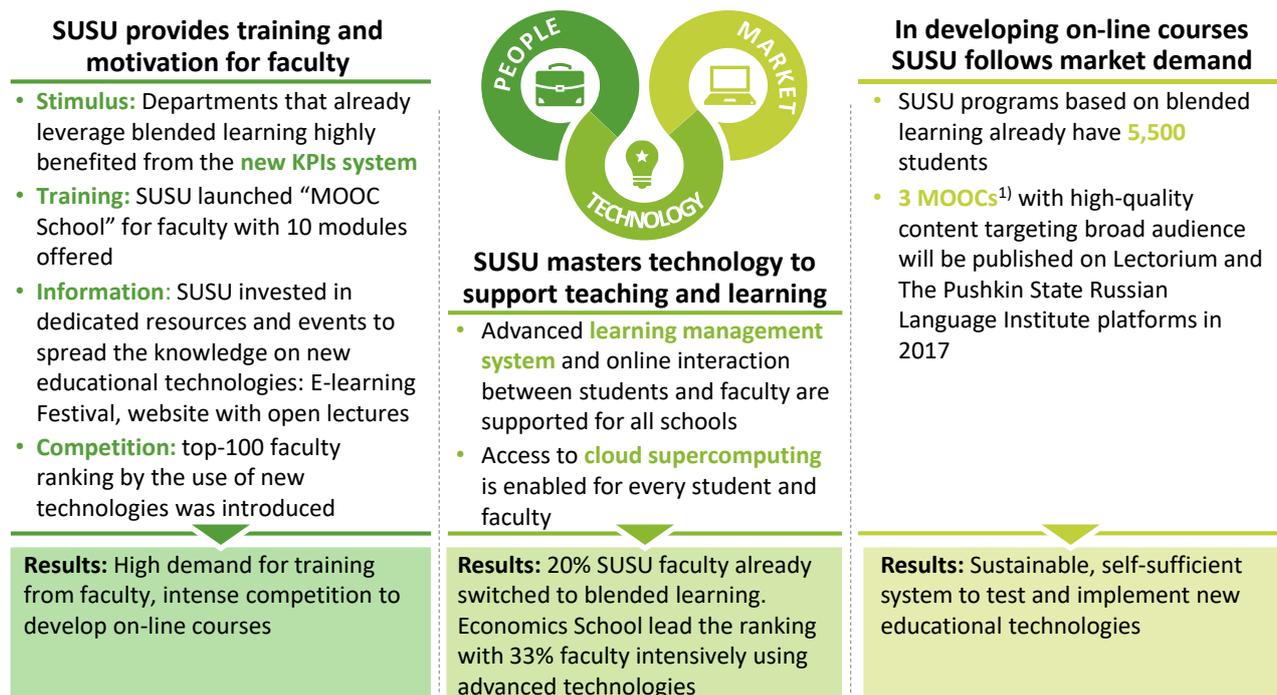
The Smart Education StrAU is making a sizeable contribution to the university's success as well as to its competitive position in Russia and globally. It is doing so through the achievement of key goals in focus areas of the university's competitiveness enhancement Programme among leading research and educational centres.



In accordance with the concept of a student-oriented university, StrAU is focused on students' interests and the development of the smart teaching & learning technologies. Students are offered a set of tools designed for their personal development and socialisation. The system of StrAUs is designed so that SUSU students develop the skills that are the most valued by employers worldwide: **lifelong learning skills and teamwork skills**. Together with the Smart Manufacturing StrAU, the Smart Education StrAU significantly contributes to **attracting talented students** by making a competitive educational offer to prospective students in Russia and globally, and by proposing a flexible, convenient educational format.

## II. Passport of the strategic academic unit of a university (StrAU)

### 1. General information about the StrAU



In 2017, the university has been expanding its academic functionality, with the number of students in mixed- and distance-learning programmes increasing by 3,000. During the first stage (2016-2018) of the action plan for the implementation of the university’s competitiveness enhancement programme (the “roadmap”), SUSU carried out four projects that prepared the foundation for the further development of new educational models and technologies:

**8.2.1. Develop Russian- and English-language MOOC courses on the leading Russian and international platforms (such as Coursera, EdX, Lectorium);**

**8.2.2. Implement a system for motivating faculty members to master new educational technologies;**

**8.2.3. Launch E-Learning 2.0: customization of on-line education through a Big Data-based supercomputer analysis of educational patterns;**

**8.2.4. Expand use of the LMS across the learning and teaching to cover all University courses.**

StrAU Smart Education serves as a university-wide digital infrastructure platform that puts the networking format<sup>1</sup> of the programmes into practice. The StrAU functions:

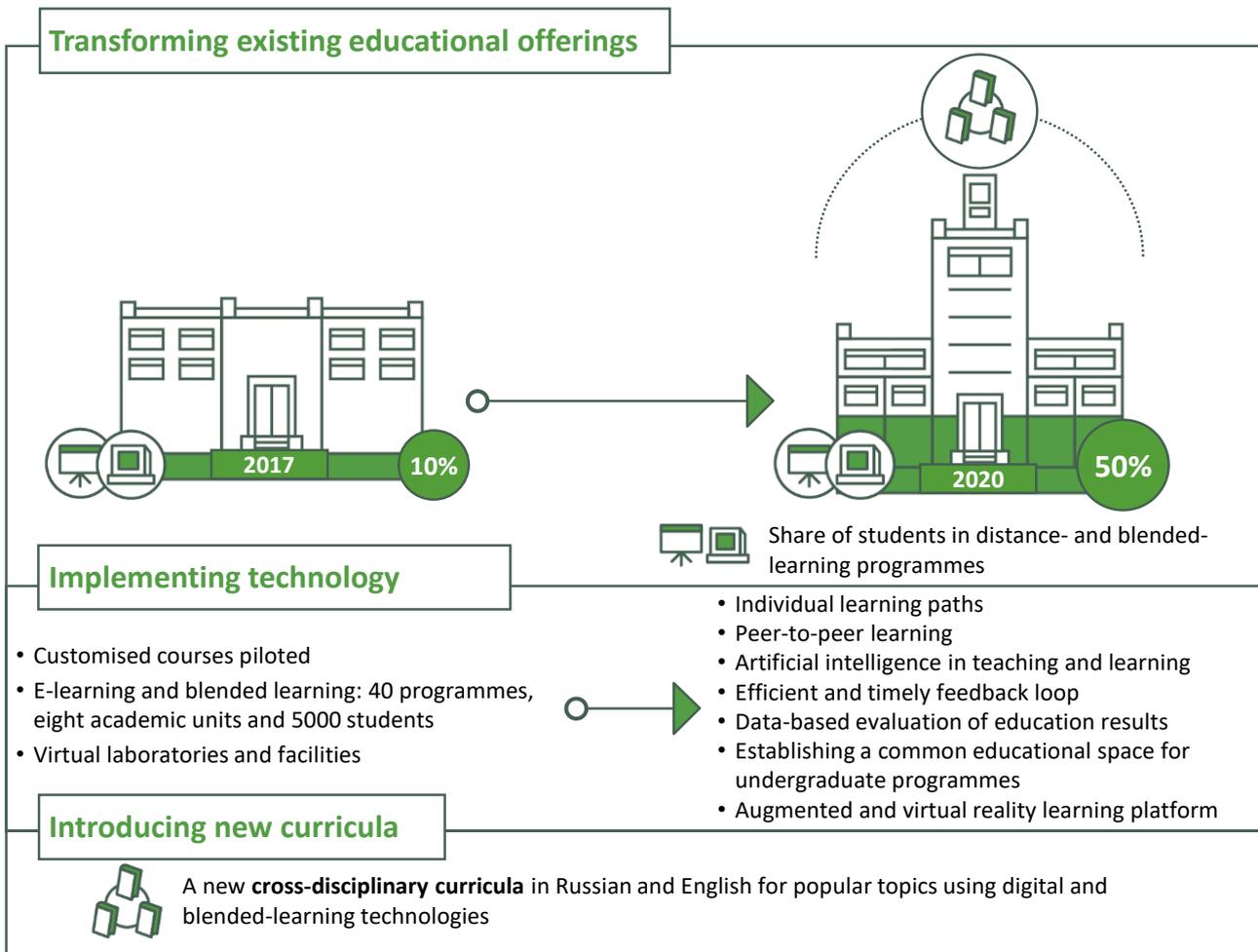
- coordinator and manager of projects to create, develop and implement new curricula, courses and mixed-learning programmes
- resource for putting together programmes in cooperation with other universities and educational platforms
- provider of the methodology, case studies and instruments that ensure the educational content of the courses
- creator of the necessary documents and knowledge to correctly use the digital SUSU platform
- as a provider of innovative instruments for personalising the educational process

<sup>1</sup> Certain elements within the educational program are provided by various University units and / or other partners (universities, platforms)

- collector of statistics on the performance of implemented projects and initiatives, promoting effective managerial decision-making.

The key StrAU Smart Education divisions proactively popularise online education and take part in events that are part of the national Modern Digital Education Network project. StrAU Smart Education will consolidate the competencies of key structural divisions, making SUSU a national leader in implementing modern teaching technologies and training specialists in the digital economy as part of the approved Digital Economy of the Russian Federation program.

StrAU Smart Education will transform the university in three areas and it is one of the key factors to ensure SUSU's position as a global leader by 2020.



### 1.1. List of structural subdivisions which will be part (administratively) of the StrAU

Table 1. Core assets and departments of the StrAU

№	Department/asset of StrAU realization
<b>Key StrAU departments</b>	
1	The Institute of Open and Distance Education. <ul style="list-style-type: none"> <li>• 5000 students on distance programs;</li> <li>• 150 mln rubles annual income;</li> <li>• 3 MOOCs, 15 distance learning programs, 25 blended programs;</li> <li>• The Institute of Open and Distance Education portal <sup>2</sup> with extensive payment functionality;</li> <li>• The New Technologies in Education portal <sup>3</sup> involves contests, workshops, virtual storage for new educational tools;</li> <li>• New Technologies in Education e-learning festival at SUSU;</li> <li>• The Distance-Learning Laboratory and a video studio for recording MOOCs;</li> <li>• Competences in productive coordination and cooperation among university's departments and external organizations;</li> <li>• Tutors competencies in new teaching and learning technologies;</li> <li>• Team with competencies in digital education and distance learning analytics;</li> <li>• Learning Management System: E-SUSU portal.</li> </ul>
2	Institute of Continuing Education, including the Continuing Education Research and Educational Centre. <ul style="list-style-type: none"> <li>• Customer base of 800 enterprises in the city of Chelyabinsk, the Chelyabinsk Region and the Ural-Siberian Region;</li> <li>• More than 100 current training and retraining programs for management and professionals;</li> <li>• 1200 students per year;</li> <li>• 80 mln rubles annual income.</li> </ul>
3	Research and Production Institute Uchtekh-Profi. <ul style="list-style-type: none"> <li>• Virtual workstation and equipment operation simulators;</li> <li>• 400 mln rubles annual income.</li> </ul>
4	Distance learning faculty of Polytechnic Institute. <ul style="list-style-type: none"> <li>• 1500 students from Russia and CIS, study base (first year) disciplines using distance learning technologies.</li> </ul>
<b>Departments attracted on the project base</b>	
5	Supercomputer Modelling Laboratory (CM). <ul style="list-style-type: none"> <li>• System for personal virtual computers (PVC).</li> </ul>
6	Higher School of Electronics and Computer Sciences, Department of Computational Mathematics and High Performance Computing. <ul style="list-style-type: none"> <li>• Research in e-learning and neural networks in Data analytics and artificial intelligence methods area.</li> </ul>
7	Pre-university education Training department. <ul style="list-style-type: none"> <li>• Children's Internet University;</li> <li>• Multidiscipline engineering contest "Zvezda" with more than 200 thousands participants.</li> </ul>
8	Higher School of Economics and Management, Economic theory, regional economics, state and municipal administration faculty. <ul style="list-style-type: none"> <li>• Active distance teaching and learning technologies implementation;</li> <li>• 3500 graduates and 25 mln rubles of income per year.</li> </ul>
9	Institute of linguistics and international communications, Foreign languages faculty. <ul style="list-style-type: none"> <li>• Multilevel teaching model for foreign languages suitable for various types of preparation level.</li> </ul>

The Smart Education StrAU relies on the partnership of four key SUSU departments: the Institute of Open and Distance Education, the Institute of Continuing Education, Uchtekh-Profi and Distance learning faculty of Polytechnic Institute. The other departments will be engaged on a project basis and will provide resources for the development of education technologies depending on their

<sup>2</sup> <http://ode.susu.ru>

<sup>3</sup> <http://nte.susu.ru>

involvement in StrAU operations. All SUSU institutes are extensively involved in the development and implementation of blended learning programs to offer a flexible education format to a wider audience.

## 1.2. Leader

The proposed candidacy for leadership of the StrAU for 2018-2020:



**Franck Leprevost**

- Professor and Vice-President of the University of Luxembourg (2005-2015).
  - Member of the Steering Committee of UNICA (The Network of 46 Universities from 35 Capitals of Europe) from 2016.
  - Research area: Algorithmic Number Theory.
- 

## 1.3. Description of key academic programs implemented by the StrAU at the moment

The university offers multiple distance and blended learning programs that cover a wide range of subjects, supporting the successful employment and professional development of its students. StrAU covers a total number of 5,629 SUSU students in the educational programs: 5,029 undergraduates (bachelor's programs), 275 postgraduates (PhD programs), 274 postgraduates (master's programs), and 51 undergraduate (specialist's programs). StrAU-based innovative learning technologies are applied in eight structural units at SUSU and cover 40 curricula.

Up to 80% of in-class activities have been converted into a distance-learning format thanks to new technologies. Attestation procedures include term papers, lab research in which students directly operate specialised equipment, test beds, instruments and working with tutors.

Blended learning format involves posting all of the mandatory learning materials in the E-SUSU system. These materials are studied at home, which frees up in-class time for interactions with tutors (e.g. project work in small groups, discussing complex topics and questions the students may have after self-study, shifting the focus from lecturing to tutoring, etc.).

Table 2. Curricula

No	Title	Number of students over the past three years
<b>Distance learning: 2,575 students, including:</b>		
<b>Engineering and Technology: 1,414 students in total, including:</b>		
1	Construction, bachelor's programme	371
2	Design and Engineering Support of Machine Production, bachelor's programme	353
3	Electric Power Engineering and Electrical Engineering, bachelor's programme	298
<b>Social and Humanitarian Studies: 1,414 students in total, including:</b>		
4	Jurisprudence, bachelor's programme (465 students) and master's programme (77 students)	542
5	Economics, bachelor's programme (259 students) and master's programme (74 students)	333
<b>Total number from the five distance-learning programmes</b>		<b>1 897</b>
<b>Blended learning: 2,799 students, including:</b>		
<b>Engineering and Technology: 2,310 students in total, including:</b>		
1	Electrical Power Engineering and Electrical Engineering, bachelor's programme	419
2	Construction, bachelor's programme	380
3	Fundamental Informatics and Information Technology, bachelor's programme (219 students) and master's programme (83 students)	302
<b>Social and Humanitarian Studies: 469 students in total, including:</b>		
4	Economics, bachelor's programme	230
5	Management, bachelor's programme (103 students) and master's programme (7 students)	110
<b>Total number from the five mixed-learning programs</b>		<b>1 441</b>
<b>Total number in the ten curricula</b>		<b>3 338</b>
<b>PhD programme</b>		<b>275</b>
<b>Total number in all curricula</b>		<b>5 629</b>

E-SUSU 2.0, an LMS system based on MOODLE, is the key element facilitating a unified distance- and mixed-learning process. SUSU has developed and implemented **over 3,500 electronic courses**.

E-SUSU 2.0 is used for the remotely completed stages of academic competitions ("Zvezda", "Prometheus", "Glory to the Man of Labour", etc.). In the 2016/17 academic year, SUSU students were taught in-classes by foreign professors who later conducted a series of remote classes in order to interact with students and assess their work through E-SUSU follow-up sessions. This learning format was also used to organise **the International School of Software Engineering as part of the Erasmus+ PWs@PhD project**.

Due to the wide scope of educational activities offered, graduates of distance- and mixed-learning programmes have been successfully recruited by various companies, which can be classified into the following categories:

1. State and municipal bodies and authorities: the Administration of the City of Chelyabinsk, the Administration of the Upper Ural Municipal District of the Chelyabinsk Region, the Office of Social Services, the Ministry of Internal Affairs, etc.
2. Major manufacturing companies: PAO Chelyabinsk Pipe-Rolling Plant, OOO Gazprom Mezhhregiongas Ufa, PAO Ashinsky Metallurgical Plant, a branch of PAO Federal Grid Company of the Unified Energy System, etc.
3. Banks: PAO Sberbank, PAO Bank URALSIB, etc.

Programs that use distance-learning technologies promote career development and offer new opportunities. Graduates reach executive positions in legal structures after completing the law and public administration programs. With the help of distance-learning technologies, students can study at remote military bases, including those outside of Russia. Graduates with disabilities get access to a quality education and uncover new opportunities to establish their own business or find permanent positions in their cities in their field of study. For example, a graduate with cerebral palsy studied law and opened his own law firm; a graduate with a musculoskeletal disorder found a job in a radio station's marketing department after studying economics. StrAU programs also help prison inmates' social adaptation and expand their opportunities to receive a proper education. For example, one graduate received his theoretical instruction while incarcerated and defended his doctoral thesis soon after his release.

Apart from its primary curricula, StrAU has about 1,200 students in 100 advanced training and professional retraining programs for executives and specialists. The main customers for these programs are leading businesses in the Urals.

In cooperation with employers, the university has designed a methodology for customising e-learning courses. **Ten customised e-learning courses** have been created based on employer recommendations. A pilot series of eight customised e-learning courses has been tested in five institutes and higher schools in the university:

- Structural Mechanics
- Electrical Machinery and Devices
- Elements of Programming
- Object-Oriented Programming
- Elements of School Psychology
- Project Management
- Event PR
- Corporate Economics

The university has designed Russia's only professional training programme in customised course development (308 hours). A pilot group of ten professors has successfully completed the course and they were certified accordingly.

#### 1.4. Key areas of focus important engineering and technical projects implemented (currently or in the past) by the StrAU

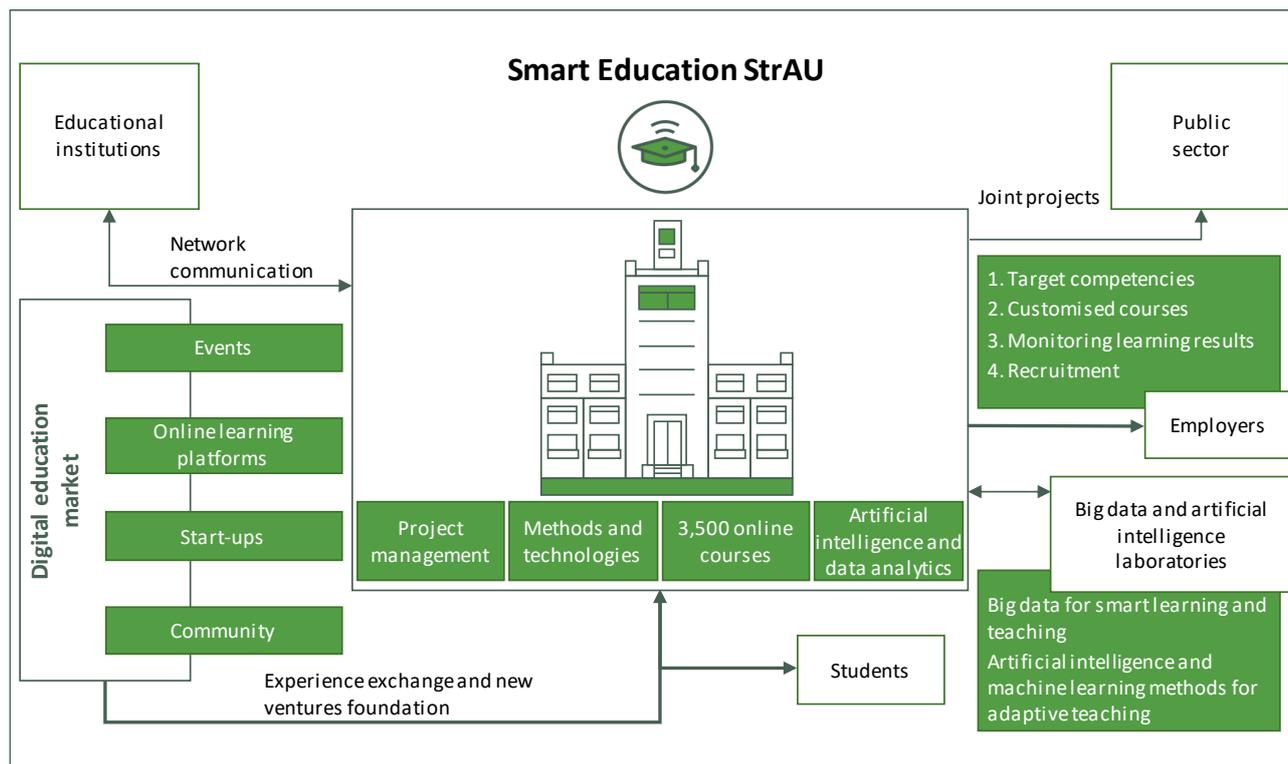
There has not yet been regular research conducted in StrAU Smart Education at the university. The Educational Equipment and Technology scientific production institute is StrAU's technological platform to apply and promote education technologies. The institute earns RUB 400m per year with an export percentage of 30%.

Table 3. Major engineering and technical projects

Virtual laboratory stands and facilities
<p><b>Project:</b> Software and hardware for a mill rolling simulator</p> <p><b>Customer:</b> PAO Volzhsky Pipe Factory</p> <p><b>Results:</b> Designed for teaching safe working methods and the operation of the PQF continuous mill section in pipe and tube production, the simulator is an effective means of providing training as well as assessing and testing operating personnel's abilities. The simulator was developed for the Volzhsky Pipe Factory. The total cost of the project is RUB 26.5m and its implementation resulted in a reduction in accident risk at the production facility by 12% and an increase in performance by 6-8%.</p>
<p><b>Project:</b> Flight simulator</p> <p><b>Customer:</b> ChelAvia Airlines</p> <p><b>Results:</b> ChelAvia developed simulators for different types of aircrafts for RUB 15m. In three years, the simulators have helped train over 120 pilots.</p>

The technology of laboratory stands and facilities will aid in the development of academic programmes on a project basis.

## 1.5. Current list of main external (in relation to the university) beneficiaries of StrAU activities



StrAUs benefit multiple entities across various industries and types of business.

### Educational Organisations

Communicative format:

- Inclusion of partners' online courses in academic programmes
- Collective research and conferences
- Access to the expertise of leading international universities

### Employers:

- OAO Russian Railways
- Rosatom
- PAO Rosneft Oil Company
- PAO Ashinsky Metallurgical Plant
- AO Satkinsky Cast Iron Plant
- Kirov Ust-Katav Rail Car Manufacturing Plant (a branch of Khronichev State Research and Production Space Centre)
- PAO AGREGAT
- FSUE Mayak Production Association

### Social sector:

- Federal Penitentiary Service of Russia: joint project on distance learning for inmates in tertiary education programmes.
- Chelyabinsk Eparchy of the Russian Orthodox Church: joint project on distance learning for clergy in remote Russian regions.

- South Ural State Medical University of the Russian Ministry of Health: the university's specialists **developed seven distance-learning programmes** to train Russian medical workers and **placed them on the Electronic SUSU platform**.
- General education institutions, including Secondary School No. 148: the development of customised courses for school psychologists. The Chelyabinsk Trade Unions Centre for Learning and Methodology, an autonomous non-profit organisation
- Sovetnik, a public organisation for consumer rights protection in the Chelyabinsk Region

### **Innovative companies in the online education sphere**

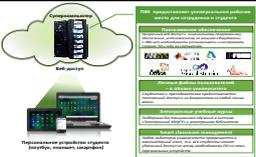
- Lectorium: with SUSU are launching a massive open online course (MOOC) through a specialised electronic platform. The project team completed the relevant MOOC training;
- Napoleon IT, which offers offline courses on software development (School of Mobile Development) and has developed a customised course based on job application tests (the course creator is V.A. Golodov of the Higher School of Electronics and Computer Sciences);
- «iSpring». The company conducted workshops (webinars) for SUSU staff to create electronic educational resources using the iSpring Suite 8 tool
- iSpring, which conducts online workshops (webinars) for SUSU faculty on creating electronic educational resources with iSpring Suite 8; arrangements have been made between the university and iSpring to collaborate further, with iSpring agreeing to conduct educational webinars and offer products for designing online learning courses

Over 3,000 participants in blended learning programs across eight structural units in SUSU have benefited from StrAUs.

## 1.6. Information about the infrastructure of the StrAU

The most valuable StrAU research equipment needed to conduct research is described in the table below.

Table 2. Infrastructure of the StrAU

№	Наименование и описание
1	E-SUSU (e-learning portal) 
The E-SUSU portal ( <a href="http://edu.susu.ru">http://edu.susu.ru</a> ) facilitates educational activities and monitors students' performance. All students and faculty members benefit from e-learning opportunities, i.e. online study materials, interim and final examinations, maintaining attendance logs and other records, etc. In the 2016/17 academic year, over 10,000 students and 500 professors used E-SUSU.	
2	UNIVERIS, a corporate information and analytics system 
The system has the following functionalities: curricula management, subject plans, class timetables, personal email, achievement management, employer interaction and individual learning trajectories.	
3	The Institute of Open and Distance Education portal 
This portal has extensive functionality and a user-friendly tuition-payment system that provides information on payments due and the preparation of payment documents.	
4	Personal Virtual Computer 
A universal tool for students and faculty to access the university's cloud-based educational services. The PVC system can be used for pre-processing and post-processing calculations for the SUSU Supercomputer Modelling Laboratory. PVC contains almost all application software available on supercomputers and additional software for learning and programming.	
5	The New Technologies in Education portal <sup>4</sup> 
This project is aimed at promoting new educational tools and technologies, and at fostering a community for professionals in online education. The project framework involves contests, workshops, virtual storage for new educational tools, an e-learning festival, etc.	
6	The Distance-Learning Laboratory and a video studio for recording MOOCs 
PCs, graphic tablets, headsets, microphones, interactive monitors, individual work stations for professors, cameras, memory cards, lighting equipment, sound equipment, background screens, editing software and a soundproof studio.	

<sup>4</sup> <http://nte.susu.ru>

## 2. Education development plans of the StrAU

### 2.1. Modernization and updating of the existing educational/training programs



#### Modernization of educational programs and implementation of new technologies in the learning process

##### Basic education (1-2 years of bachelor's degree).

The university will ensure a two-year transition period **for bachelor's programmes**, enabling a smooth **transition to a distance-learning** format with the use of courses built on the basis of adaptive learning technologies and the use of laboratories with virtual and augmented reality technologies. Specialization courses - social science subjects and basic engineering courses. Introduction MOOC of the leading universities in the educational process as an alternative to some courses of SUSU.

In addition, distance technologies will offer new educational products in for pre-university stage, including the opportunity to **complete 1-year undergraduate courses online from high school**. The StrAU will make it possible to create a **single educational space for bachelor's programmes**, apply **individual educational trajectories** and increase the quality of the programmes by leveraging **feedback instruments** and competition.

##### Specialization courses (3-4 years of bachelor's degree).

As part of the extensive implementation of distance technologies throughout SUSU, StrAU will **enrich blended learning courses for third- and fourth-year students**, including those that are in collaboration with the "Uchtekh-Profi" (using interactive simulators and equipment). Educational programmes will combine a project-based approach and distance learning, and online courses are a pillar of project design work at the university and production. The university will **customise the educational programmes for employers' HR needs** through a specialised internet platform. The platform is expected to launch in a test format by the end of fall 2017.

StrAU is improving the quality of its academic programmes by **training faculty members in digital education**. **The university popularizes pedagogical competences in e-education** and invests in dedicated resources and events to spread the knowledge on new educational technologies: E-learning Festival, website with open lectures.

StrAU Smart Education provides **technological and methodological support of CAE Smart Industry programmes**. Educational programmes planned for launch will widely use new education technologies and the objective of StrAU Smart Education is to implement the innovations in the course of the project design works as effectively as possible. The joint efforts of the two StrAUs in data analytics and artificial intelligence methodologies will change the quality of education in the near future through high-level R&D capacity and the practical expertise of the Smart Manufacturing divisions.

## Methods and Technologies.

StrAU will adopt new educational methods and technologies in all aspects of the university's activities. In particular, the following instruments are suggested:

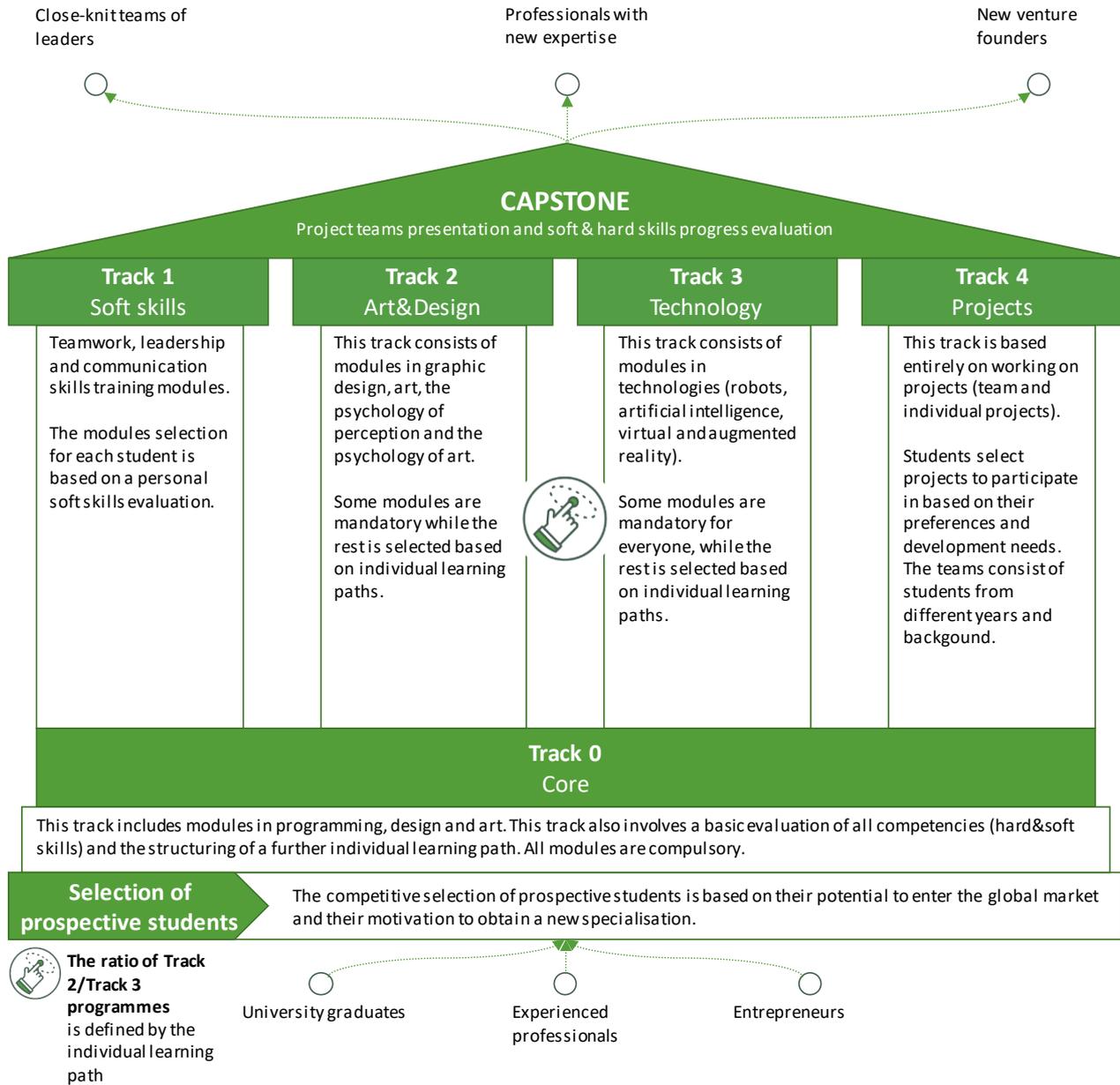
- **Educational process forecasting** – analysing the peculiarities of the courses for learners from the perspective of perception and of how effectively the material is understood
- **Training personalisation** – monitoring individual training results, competency assessment, and correction of **individual trajectories**
- **Evaluation of learning results** based on statistics data
- **Assessment of students' competencies** through the project-based approach
- **Customisation** of educational programmes through a **special internet platform** <http://cust.susu.ru>. The platform is expected to launch in a test format in the end of fall 2017
- **Peer-to-peer learning**
- **Application of artificial intelligence** in educational process
- Adoption of eLearning Analytics

To acknowledge the quality of education and compliance of e-learning at SUSU with European e-learning standards, CAE is planning to carry out international accreditation of EFQUEL distance technologies with assignation of the UNIQUe quality label.



## Introduction of new educational programs

**New program structure** by the example of interdisciplinary program Art & Technology:  
Interactive design.



All new StrAU programmes will be **cross-disciplinary** and **integrated into a unique and innovative education system** that stimulates creativity and the development of entrepreneurial skills.

## Interdisciplinary programs

### 1. Program title: Art&Technology: Interactive design.

**Program leader:** Oded Ezer (Israel), a graphic designer and member of Alliance Graphique Internationale since 2009, as well as the winner of various international competitions. His work is displayed in permanent exhibitions at major museums in the US, UK, Switzerland and Israel.

**Prerequisites:** this multidisciplinary program combines two fields: design (video art, interactive art installations, generative design, computer games) and modern engineering and technology (programming, neural networks, AI, robotics, VR, AR, meters, sensors, etc.).

**Program Description:** in this program, students will learn how to digitally apply modern engineering and technology skills to design in ways that go beyond traditional industrial applications, creating interactive projects in which art itself is generated by machines guided by rules set by a human or another machine.

**Result:** a graduate of this programme is an entrepreneur and a creator of interactive projects based on human-computer interactions; they are engaged in creating elements of the new digital environment in the post-industrial world.

### 2. Program title: Smart education.

**Program leader:** 1) Vladimir Lvovich Uskov, Professor, Department of Computer Sciences and Information Systems, Bradley University (USA); 2) Kosinsky Mihail (h-index – 16), Assistant Professor at Stanford Graduate School of Business

**Partners:** The Psychometrics Centre, University of Cambridge, Online Training at the Centre for Psychometric Research in Online Education at NRU Higher School of Economics.

**Prerequisites:** Smart Education tackles a global challenge – the advancement of digital technology – and focuses on the transition from a traditional educational model to a new system of education management. The wide penetration of virtual and augmented reality into all spheres of life, primarily in the form of game applications; the need for analysing the education process, taking into account the accelerating growth of information in the education process.

**Result:** the graduates of this programme are innovative educational product developers, educational project leaders capable in various modern technologies.

**Profile 1: Smart education: analytics, pedagogy and technologies.** Students will learn adaptive technologies in education, develop educational projects that use technologies of artificial intelligence and the Internet of things on the basis of analysis of data on the learning process, create a trainee profile, develop individual educational trajectories.

**Profile 2: (Development of VR worlds in education).** Within the framework of the programme the students will study gaming design methods, gaming mechanics, game design and gamification in the education, perceptual psychology, pedagogic design technologies, create virtual models and worlds of various scales: from individual units to a full scale virtual laboratory capable of replacing expensive equipment.

### 3. Program title: The program of supplementary education “Innovative technologies in translation” for the linguistics bachelors zone of elite training

**Program leade:** Professor Norbert Berger, The University of Graz

**Prerequisites:** Broad penetration of the automated processing technologies for non-structured textual data in all spheres of life is one of the modern trends; in particular, in the form of applications and services for machine translation, processes automation for text authorisation, copyrighting, etc.

**Programme Description:** This programme emphasises creation and implementation into the education process and professional linguist activities of the information technologies allowing automating processes of independent preparation of a science text, including its machine translation, for various application domains.

**Result:** The graduates of this programme are developers of the software environment for automated creation and translation of science texts, including computer training simulators for machine translation, ready introduce similar information technologies into the professional linguist activities.

#### 4. Program title: Medical Cybernetics

**Programme Leader:** Vladimir Alexandrovich Potemkin (H-index: 12), head of the SUSU computer pharmaceutical products modelling lab, is a renowned specialist in the molecular design of pharmaceuticals and the intellectual data analysis through information technologies in the medical and pharmaceutical spheres.

**Partners:** Leiden University Medical Centre; Harvard University Medical School; University of North Texas, Fort Worth Medical School; SUNY Upstate Medical University, Syracuse, NY, MSU (the Department of Fundamental Medicine); Siberian State Medical University (Department of Medical Biochemistry); Kazan (Volga Region) Federal University (Institute of Fundamental Medicine and Biology).

**Prerequisites:** This interdisciplinary programme is interfaced with medicine, informatics, physics and biology, and allows, using computer monitoring and information technologies in general to obtain and process data, ensuring accurate diagnosis of diseases and experimental modelling of pathological processes in a human body.

**Programme Description:** the students will learn to use specialised medical information systems for processing medical data for the purposes of diagnostics and treatment process monitoring, identifying patient conditions, body function disorders. Moreover, the students will learn to handle modern medical equipment and acquire skills of the intellectual data analysis.

**Result:** Graduates are able to perform a wide range of tasks, such as operating medical computer equipment, including laboratory research utilising up-to-date devices. These specialists will play a major role in the implementation of big data analysis within the medical sphere and transform the medical sphere in accordance with the present and future trends.

### Network science programs

#### 5. Program title: Virtual HighTech Engineering

**Programme Leader:** Professor Yunan Prawoto (USA, Indonesia, H-index = 11), who has extensive experience in working in foreign universities in engineering and materials science.

**Partners:** PLM-Ural; Siemens AG; the Computer Science & Engineering departments of RWTH Aachen University, Munich University of Applied Science, University of Texas at Arlington, University of South Carolina, MIT, Ohio State University, University of South Florida and MSTU.

**Prerequisites:** traditional design and production methods are limited in a number of ways due to the high

costs of prototypes and verification nature tests, increased number of development cycles, underutilisation of the revolutionary construction materials characteristics. To overcome these limitations there is needed a production process management based on the digital high-tech engineering.

**Programme Description:** within the framework of this programme, the learning process is organised based on a combination of at-home and off-home educational technologies in the virtual high-tech CAD/CAM/CAE/PLM engineering product lines. The Siemens PLM (product lifecycle management) concept is used as a basis for engineering; virtualisation (aka “digitisation”) has a major role in it.

**Result:** graduates from this programme represent the new profession: a virtual engineering products developer. They also can utilise their skills in any engineering, educational and scientific organisations in Russia and abroad, including inclusion in the SUSU’s employment pool.

## 6. Program title: Smart materials

**Partners:** University of Strasbourg; University of Central Florida, Karpov Research Institute of Physical Chemistry.

**Prerequisites:** Creation of smart materials with prescribed properties is one of the most actual directions in the modern production sphere. This interdisciplinary programme interfaced with chemistry, physics and computer sciences is dedicated to study of a matter structure at the electron density properties level, crystal properties modelling and the approaches to its engineering.

**Programme Description:** within the framework of this programme the students will acquire most up-to-date and modern knowledge on monocrystals structure, including molecular ones; will learn multi-scale modelling principles in chemistry, including, based on the computer experiment approaches; learn to explain physicochemical properties of materials from the point of view of the modern theoretical chemistry; and obtain structure analysis skills for new materials with required characteristics. Among the programme disciplines are such leading-edge directions as chemo informatics, modern chemical bond theory, quantum crystal chemistry.

**Result:** graduates of the programme are researcher-developers of smart materials with prescribed properties based on the computer technologies of chemistry multi-scale modelling.



## Customized educational offering and social impact

### MOOC development

StrAU departments have finalised and launched MOOC “Renewable Energy Sources” (<https://www.lektorium.tv/mooc2/29772>) on the Lectorium.

The MOOC modular programme for professional development has already launched. Two modules are live:

1. MOOC: modern learning format (24 hours).
2. MOOC: designing a pedagogic blueprint (48 hours).

Modules to be launched:

1. MOOC: faculty involvement in the production of video lectures.
2. MOOC: course testing, launching and support.

### 3. MOOC: analysing learning results.

The University develops a wide range of MOOCs on various subjects, the competitive advantage of which is adaptability - the ability to build an individual trajectory of learning for students with different background, thereby increase the efficiency and quality of understanding the material:

- The Power Industry: Issues and Development Prospects
- Elements of Formal Analysis of Natural Languages
- Starting Your Business from Scratch: Legal Aspects
- Networking in Students' Projects and Research
- Philosophical Practice
- Internal PR
- Elements of Graphic Design
- Stress: Medical, Psychological, Social and Cultural Aspects.

### **Training of prisoners on the off-campus study format utilizing remote technologies under programs of the higher and vocational education.**

**Customer :** The Federal Penitentiary Service of Russia

**Programme Description:** students are suggested **21 programs** in social and humanitarian studies and in engineering. The learning process is powered by E-SUSU, Adobe Connect Pro (a system of video streaming and recorded video lecture playback), a virtual workstation and equipment operation simulators.

### **Professional development of clergy in remote areas of Russia**

**Customer:** Chelyabinsk Eparchy of the Russian Orthodox Church

**Programme Description:** based on a mixed education format: more than 70% of classes are in a distance learning format, including lectures, control events, practical training, as well as faculty members consultations. Emphasis is made on remote populated areas of Chelyabinsk region, Far East, Siberia, CIS countries (Kazakhstan, Kyrgyzstan, Uzbekistan), i.e. remote regions with the remaining presence of the Russian Orthodox Church and a large demand for specialists. The disciplines studied within the SUSU's and Chelyabinsk Eparchy's programme are recognised by the Ekaterinburg seminary for continuation of learning, allowing reducing apprenticeship period in the seminary down to two months. The SUSU's experience in the Theology direction using distance-learning technologies **is unique for Russia.**

### **Children's Internet University**

The University plans to reach the children's audience (8+) in 2017-2020 by creating and developing the **Children's Internet University**. The faculty of pre-university training conducts great work within the framework of the concept of continuing education, helping students in grades 5-11 in choosing a specialty, preparing for admission to an institution of higher learning, developing creative and research abilities.

## **2.2. Measures aimed at development of faculty members and research staff**

1. The faculty members in the StrAUs will be **selected from international candidates on a competitive basis** while the most distinguished SUSU staff will be selected based on KPIs.
2. **StrAUs will invite talented postdocs** to teach and carry out research at SUSU.
3. **Long-term secondments for postgraduates and young researchers** in leading international universities and large enterprises, along with **participation in prestigious international conferences**, will become an essential staff development tool.
4. **The StrAU faculty will study English** and take mandatory international certification exams.
5. **The StrAU R&D staff will study project management, communication and business skills**, and they will be eligible for subsidies to start up their own businesses based on SUSU research.
6. In order to motivate active research activities of StrAU, SUSU, in cooperation with leading scientific centers and companies, will establish **research grants for young scientists**, graduate students and masters, which will enhance the academic reputation of the university in the international community.

SUSU is planning to bring in leading researchers to encourage faculty engagement in carrying out and upgrading academic programs.

Table 3. StrAU staff composition.

No.	Full name	Primary place of employment and achievements	Photo
<b>Visionaries</b>			
1	Ainur Abdalnasyrov	<ul style="list-style-type: none"> <li>CEO and founder of LinguaLeo, a web service for studying and practising English with over 16 million users around the world.</li> </ul>	
2	Yakov Mikhailovich Somov	<ul style="list-style-type: none"> <li>Founder of Lectorium, which has over 100 partners and 105,000 learners using their platform, as well as over 4,000 lectures published.</li> </ul>	
<b>Researchers</b>			
3	Dmitry Fyodorovich Abbakumov	<ul style="list-style-type: none"> <li>Director for Online Training at the Centre for Psychometric Research in Online Education at NRU Higher School of Economics.</li> <li>PhD, Katholieke Universiteit Leuven (Belgium)</li> </ul>	
4	Kosinsky Mihail	<ul style="list-style-type: none"> <li>Assistant Professor, Stanford Graduate School of Business</li> <li>h-index – 16</li> <li>PhD in Psychology, University of Cambridge</li> </ul>	
5	Vladimir Lvovich Uskov	<ul style="list-style-type: none"> <li>Professor, Department of Computer Sciences and Information Systems, Bradley University (USA)</li> <li>Member of the Executive Board of the IEEE Technical Committee on Learning Technology (TCLT)</li> <li>IEEE Senior Member (Institute of Electrical and Electronics Engineers, more than 432 thousand participants in 160 countries)</li> </ul>	
<b>Educational projects leaders</b>			
6	Tatiana Mikhailovna Kovaleva	<ul style="list-style-type: none"> <li>President, MOO Inter-Regional Tutor Association, PhD in pedagogics.</li> <li>Leader of the Skolkovo Tutorial School Model and an international prize-winner in 2012.</li> <li>Member of the Commission of the Ministry of Education and Science for the Development of Innovative Infrastructure in the Sphere of Education.</li> </ul>	

7	Alexey Evgenyevich Polovinkin	<ul style="list-style-type: none"> <li>• Director of Development for Foxford Online School, Russia's largest online school with over one million users.</li> </ul>	
8	Prawoto Yunan	<ul style="list-style-type: none"> <li>• H-index – 11</li> <li>• PhD, University of Missouri-Columbia, specializing in Mechanics-materials science</li> </ul>	
9	Elena Vladimirovna Tikhomirova	<ul style="list-style-type: none"> <li>• Founder of the eLearning Centre, which was established in 2004 and currently offers over 250 eLearning courses for employees of major Russian corporations. Developer of individualised curricula for companies.</li> <li>• Professional instructional systems designer and teacher of the proprietary courses “Instructional Design”, “Designing an Interface for Online Learning”, leader of other trainings on how to develop and manage e-learning projects.</li> </ul>	
10	Oded Ezer	<ul style="list-style-type: none"> <li>• Graphic Designer and Printer, member of Alliance Graphique Internationale since 2009 and the winner of various international competitions. His work is on display at major museums in the US, UK, Switzerland and Israel.</li> </ul>	

### 3. Research development plans

#### 3.1. List of focus areas of the research activities/important engineering and technical projects of the StrAU

Priority areas of research activity serve as an evidence base for transforming the learning process for the entire University. Cooperation and interaction between the two StrAUs at SUSU has brought the Smart Manufacturing StrAU's **data analytics and AI technologies** to the Smart Education StrAU, changing their research in the field of electronic pedagogics. This is an important R&D component of the StrAUs and this is making a significant contribution to partnerships with international universities in issuing joint publications and organising conferences and forums. Organisation of the research activities within the framework of the StrAU Smart Education stipulates the attraction of the leading scientists to form research teams, as well as the attraction of the young scientists (postdocs) to perform research in priority StrAU areas.

##### 1. Data analysis and artificial intelligence methods in education.

Research direction — elaboration of intellectual systems for the education sphere, including the following:

- intellectual systems identifying weak spots in the electronic learning courses based on the data obtained as a result of completion of the courses by the students, and providing

- recommendations on the required adjustments to the course;
- systems that analyse perception of the educational materials by the students during the in-class learning and prepare recommendations for the faculty members in order to increase the education process effectiveness;
- virtual facilitators assisting in choosing an individual learning trajectory based on the abilities, current educational evaluation and life goals of the student.

Prospective partners:

- Institute for Creative Technologies, University of South Carolina;
- Assessment Research Centre, University of Melbourne.

## **2. Adaptive Education Technologies.**

Research area: designing courses through adaptive testing that factors in various students' backgrounds and develops recommendations and services for students based on their knowledge and preferences.

## **3. Project «Avatar».**

Project utilises the SUSU's experience in development of virtual stands and complexes. Project purpose — creation of a distance learning system utilising a virtual learning platform. This system will feature such technologies as virtual labs with innovative device and integral unit models for engineering sciences, the intellectual teacher (software module for reading lectures, responding to the students questions), there will be introduced a voice and hand-written formulas recognition technology based on the neural networks. The following project tasks are being resolved:

- Development of didactic modules combining capabilities of adding multimedia learning materials, virtual labs utilisation, remote professional training and testing at the educational institutions and manufacturing enterprises.
- Development of the professional training platform with the voice HMI, virtual reality, virtual classrooms and neural networks.
- Development of virtual didactic modules for manufacturing specialists in the course Mechatronics and Robotics course (multimedia learning modules, interactive mechanisms 3D model, technical systems and their assemblies).

## **4. Performance indicators of the StrAU**

### **4.1. List of the most important focus areas (science, education, engineering and technical research) for the StrAU in which the university will be highly competitive throughout the next 3-5 years**

1. A new effective model of training organization based on remote technologies
2. Portfolio of popular interdisciplinary programs (Art&Technology, Smart Education, Medical Cybernetics, Virtual HighTech Engineering, etc.)
3. Innovative belt of companies developing solutions and services for smart education
4. Development of customized courses taking into account the recommendations of employers and based on a unique technology platform
5. Virtual educational platform "Avatar" for engineering sciences

The organization of research, publication activity and activities in the development of educational activities will allow SUSU to enter the subject rating of QS "Social Sciences" - Education (top-300)

and to transform the educational process.

#### **4.2. Effect of the development of the StrAU on the activities and indicators of the university's "Roadmap"**

The development of the Smart Education StrAU affects the following indicators of the Roadmap:

1. The number of higher-education programmes and additional professional programmes developed and implemented in partnership with leading Russian and international universities and/or with leading Russian and international research organisations.
2. The number of R&D projects implemented with the involvement of leading Russian and foreign researchers as project leaders and/or joint projects with leading Russian and overseas scientific organisations at the university, including the possibility of setting up structural units at the university.

The development of SAE "Smart Education" requires the following activities:

3.3.4 Develop a University-based system of academic conferences, competitions, contests and new forms of professional navigation for applicants to bachelor and Master's degree programs, including for the purposes of selection and recruitment of talented applicants on base of the results of the competitions.

3.3.6 Develop and implement a new system for recruiting foreign applicants.

8.1.2 Create elite bachelor training zones for students with high academic results (honors college').

8.1.4 Reduce the percentage of in-class work while increasing the share of independent student work; introduce a tutoring system.

8.1.5 Form a unified educational environment for bachelor studies with a free course selection mechanism available to students.

### **5. StrAU structure and governance system**

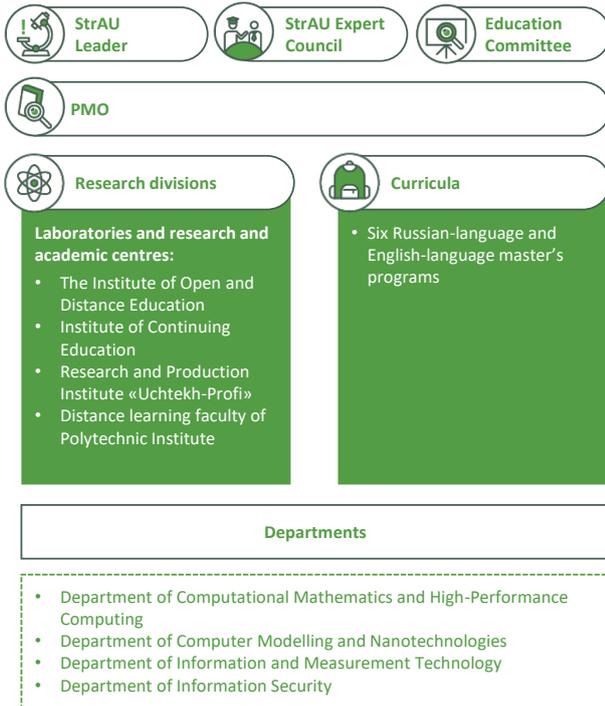
#### **5.1. Composition and structure of the StrAU at the moment of its establishment and key changes in the composition and structure within a 5-year period**

The Smart Education StrAU will be set up as a new institutional unit cooperating with different university schools and departments, as well as with the Smart Education StrAU to carry out research and academic programmes. This new unit will engage world-class researchers, the best SUSU staff and members of the management team.

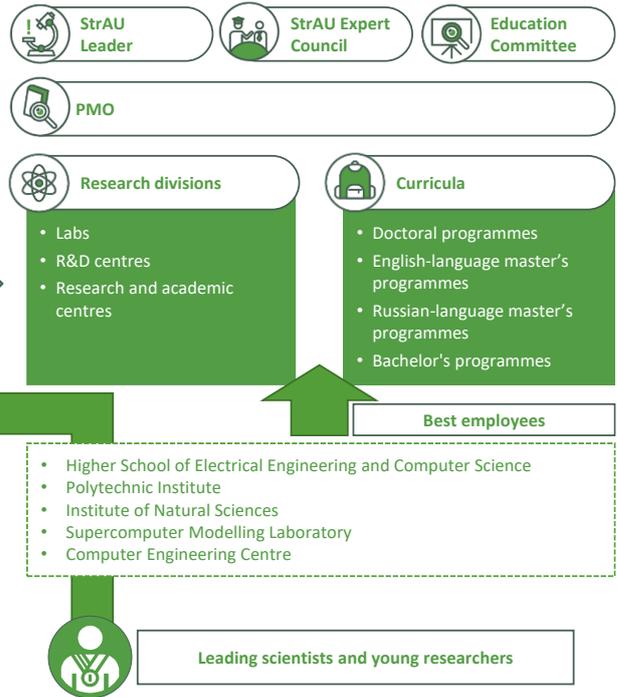
StrAU will have a two-tier management structure:

- The SUSU International Academic Advisory Council, StrAU Expert Council and StrAU Committee on Modernising Education.
- The StrAU Leader and the StrAU Project Management Office (PMO).

2017



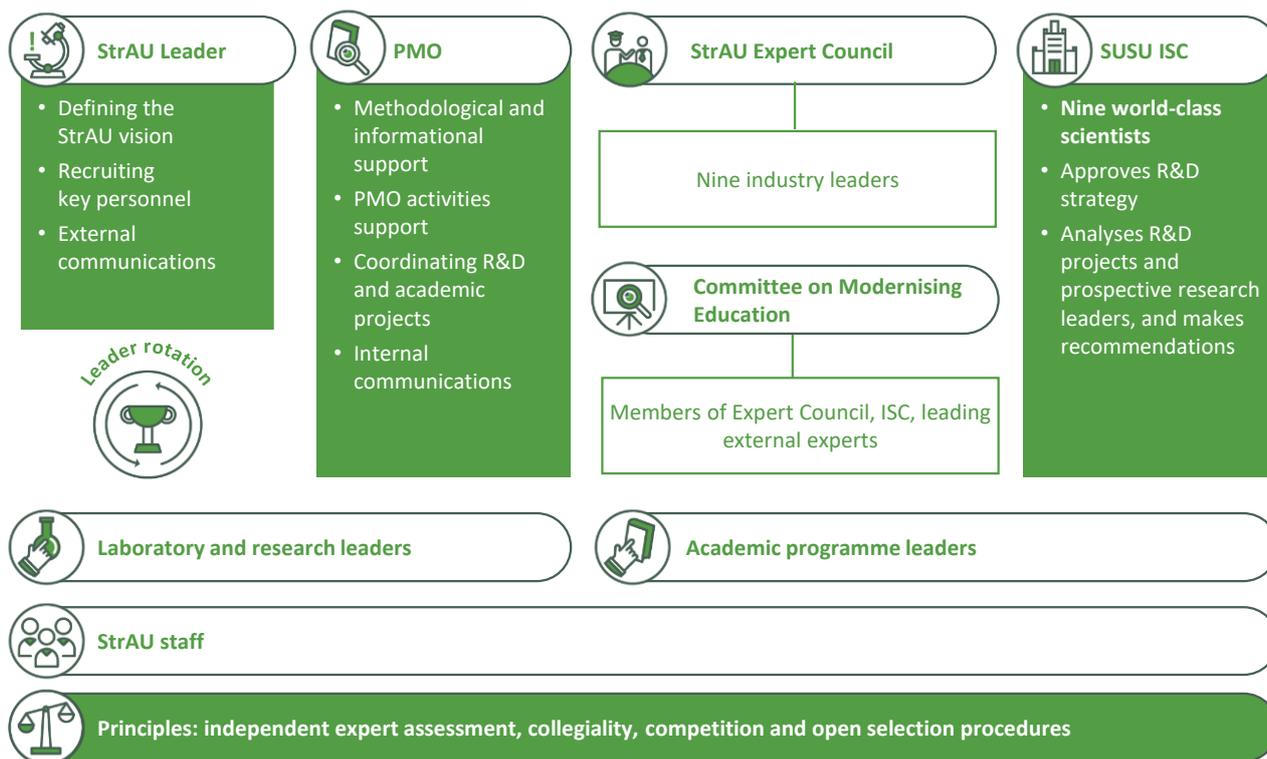
2020



## 5.2. Governance structure

All decisions will be made based on the expertise of the three **StrAU advisory bodies**:

- The SUSU **International Academic Advisory Council (IAAC)** makes decisions on strategic aspects of StrAU development, provides recommendations on financial support to large research projects from the Project 5-100 budget and approves the StrAU's research strategy.
- **The StrAU Expert Council** is a collegial body formed from representatives of leading companies working in priority industries, global online education leaders, and leading corporate universities. The council consists of nine people and it reviews detailed plans for developing applied research. The council also approves competition procedures, scholarships and grants for research in the interests of business.
- **The StrAU Committee on Modernising Education** is a collegial body of seven experts, including representatives of the IAAC, representatives of the StrAU Expert Council and leading education experts. The committee provides recommendations on academic programmes and their modernisation, reviewing compliance with competency standards and market demand.



### StrAU executive bodies:

- **The StrAU Leader** is a visionary who develops and presents the StrAU research and education development strategy, including the programme for attracting researchers and implementing large research projects, and also supervises the StrAU's strategic development. The StrAU Leader is appointed for three years from a pool of leading global researchers. The appointee for the position is not allowed to hold the office for more than two consecutive terms.
- **The StrAU PMO** provides methodological and information support, coordinates academic and research projects and manages internal communications. The StrAU PMO controls the implementation of strategies, decisions and projects approved by the StrAU collegial bodies and StrAU Leader that may require bringing in external specialists and resources.

Candidates for **the Expert Council** can be nominated by the Rector or by members of the IAAC for SUSU's Project 5-100 programme. The IAAC makes the decision to put the nominated candidate on the StrAU's Expert Council by a simple majority vote.

### 5.3. StrAU's level of autonomy

StrAUs are autonomous and independent in terms of budgeting and funding. The university provides budget for implementing academic programmes and research projects, and also additional funding that is allocated based on the IAAC's recommendations. The decisions to create new laboratories, research and education centres, and to appoint leading scientists to the StrAU are made on recommendations of the IAAC following the competition procedures. The StrAU will independently raise grants and financing from business by cooperating with the leading global corporations.

The StrAU has powers to expand or reduce its research teams, launch or discontinue academic programmes, organise competition procedures to recruit employees (except leading scientists). Internal administrative functions (accounting, HR and legal departments) for all StrAUs are centralised at the university level. Programme managers are granted broad powers of autonomy within the approved parameters of research projects or academic programmes. When necessary, decisions are made by the Academic Board and Supervisory Board within their powers as granted by the SUSU Charter.

As the StrAU structure evolves, the StrAU will become more autonomous financially and administratively, as well as in other ways.

## 6. StrAU development schedule

№	Description	Deliverables	Deadline		
			2018	2019	2020
<b>1.</b>	<b>Organisational changes</b>				
1.1.	Ensure the regular operation of the SUSU International Scientific Council	Regular operation of SUSU International Scientific Council ensured	December	December	December
1.2.	Restructure and modernise university divisions to enhance efficiency	SUSU divisions restructured	January-December	January-December	January-December
1.3.	Ensure regular PMO operation, including StrAU implementation	Regular PMO operation ensured	December	December	December
1.4.	Conduct information campaigns on StrAU operations in general and also about each individual StrAU	StrAU information campaigns conducted	January-December	January-December	January-December
1.5.	Develop faculty incentives and development systems for the StrAUs	Incentive and development systems set up	January-December	January-December	January-December
	<b>Forming and developing StrAUs</b>	<p><b>Smart Education StrAU 2</b></p> <p><b>StrAU 2 objectives:</b> Transform SUSU into a university where the emphasis is on the student and where people of various professional and educational backgrounds can find a wide range of quality academic programmes equipped with cutting-edge learning technologies. StrAU 2 will lead to the university's promotion in the QS and THE rankings by improving its reputation in the academic community.</p> <p><b>StrAU 2 tasks:</b></p> <ul style="list-style-type: none"> <li>○ Create new high-demand programmes and products</li> <li>○ Expand industrial partnerships</li> <li>○ Develop distance learning in basic academic programmes</li> <li>○ Promote a data-driven approach to learning process management</li> <li>○ Apply data analytics and AI methodologies to electronic teaching</li> </ul>			
<b>2.</b>	<b>Changes and results in educational activities</b>				
2.1.	Use student enrolment pattern analysis to eliminate low-demand programmes	Programmes restructured	December	December	December
2.2.	Implement and develop new recruiting and engagement systems for talented applicants from Russian and foreign universities	Recruitment efficiency enhanced	January-December	January-December	January-December

№	Description	Deliverables	Deadline		
			2018	2019	2020
2.3.	Ensure the modernisation of academic programmes to introduce a task-oriented and project-oriented approach to learning	Task-oriented and project-oriented learning approach introduced	January-December	January-December	January-December
2.4.	Develop the university's system for recruiting international PhD students, especially through the creation of a system of grants for talented applicants	International PhD student recruitment system established	January-December	January-December	January-December
2.5.	Develop an academic mobility system among leading Russian and foreign universities for students, PhD students and talented faculty	Academic mobility for the university's students ensured	January-December	January-December	January-December
2.6.	Establish new academic programmes (including English-language programmes) partnering with leading R&D institutions and high-tech companies	New academic programmes in cooperation with Russian and foreign partners established	January-December	January-December	January-December
2.7.	Add business skills modules to academic programmes	New business skills modules in the university's various academic programmes established	September	September	September
2.8.	Ensure the optimisation of educational processes to decrease the amount of in-class activities	Number of in-class activities drops	September	September	September
<b>3.</b>	<b>Changes and results in R&amp;D activities</b>				
3.1.	Engage leading world-class scientists and researchers in key development areas	Top Russian and foreign researchers brought in	January-December	January-December	January-December
3.2.	Develop and maintain laboratories to conduct research in key StrAU areas including fundamental research	Lab development and maintenance ensured	January-December	January-December	January-December
3.3.	Develop a system to recruit and hire junior academic staff and develop a competitive process for the selection of applicants	Junior academic staff engagement and development system established	January-December	January-December	January-December
3.4.	Improve the system for motivating academic staff and PhD students to publish articles in leading academic journals	System for motivating academic staff and PhD students to publish articles established	January-December	January-December	January-December
3.5.	Develop a subsidy system to support academic staff, PhD students and students in their fundamental research activities	Subsidy system for academic staff, PhD students and students established	December	December	December
<b>4.</b>	<b>General changes and results, incl. at university level</b>				

№	Description	Deliverables	Deadline		
			2018	2019	2020
4.1.	Restructure business processes, including the implementation of a CRM system and automated workflow	Workflow automation ensured	December	December	December
4.2.	Develop a recruiting system for new staff and build a talent pool	Talent pool of highly talented individuals formed	December	December	December
4.3.	Modernise the multilingual infrastructure for scientific, academic and extracurricular activities	Bilingual infrastructure in place	January-December	January-December	January-December
4.4.	Ensure the university's development in the global academic community, i.e. by including the university's journals in the Scopus and Web of Science databases	Inclusion of the university's journals in the Scopus and Web of Science databases ensured	December	December	December

## Appendix

**Table 1. Performance Indicators of the StrAU**

№	Indicator	Fact	Plan			
		2016	2017	2018	2019	2020
1.	StrAU acting subject rank in ARWU, THE, QS subject rankings (according to university's roadmap)					
1a	Rank in QS «Computer Science» subject ranking				351-400	301-350
1b	Rank in QS «Mechanical, Aeronautical & Manufacturing Engineering» subject ranking			201-300	201-300	201-300
1c	Rank in QS «Materials Science» subject ranking					100
2.	Number of articles in the Web of Science per StrAU academician/researcher	-	0,1	0,4	1,0	2,2
3.	Number of articles in the Scopus per StrAU academician/researcher	-	0,2	0,6	1,5	3,5
4.	Average citation index per StrAU researcher/academician measured by the total count of articles included in the Web of Science database	-	-	0,1	0,4	1,3
5.	Average citation index per StrAU researcher/academician measured by the total count of articles included in the Scopus database	-	-	0,2	0,6	2,0
6.	Proportion of foreign professors, academicians and researchers in the total headcount of researchers and academicians in StrAU, including Russian nationals holding a PhD from foreign universities	-	10%	20%	20%	20%
7.	Proportion of foreign students enrolled in the main educational programs of the University's StrAU (including students from the CIS countries)	10%	11%	15%	20%	25%
8.	An average USE (Unified State Examinations) score of full-time students enrolled at the University with their tuition to be paid out of the federal budget under bachelor and specialist degree StrAU programs	65,8	69,0	72,0	75,0	78,0
9.	Proportion of revenues from non-budget sources in the structure of the StrAU revenues	98%	90%	80%	70%	60%

**Table 2. Quantitative characteristics of StrAU's development**

№	Indicator	Fact	Plan			
		2016	2017	2018	2019	2020
1.	Number of StrAU educational programs with international accreditation, units	-	-	1	2	2
2.	Number of StrAU foreign language education programs	1	1	2	3	5
3.	Number of StrAU double-diploma education programs	1	2	3	4	5
4.	Share of StrAU main educational programs students, who are involved in research projects, in total number of StrAU students	-	-	0,9	3,0	8,0
5.	Share of StrAU main educational programs students in total number of university's students	10	15	23	34	50
5a	The same for bachelor programs	9	15	26	41	64
5b	The same for master programs	6	10	15	20	25
5c	The same for post-graduate programs	51	53	55	58	60
6.	Share of StrAU faculty, who have made publications in Scopus or Web of Science database, in total number of StrAU faculty	-	-	25	40	50
7.	Share of StrAU staff in total number of educational organization staff	2,0	2,2	3,0	4,0	5,0
8.	Number of intellectual activities results (IAR) created by StrAU staff	15	25	35	45	55
9.	Average SNIP of journals, indexed in the Scopus database, which published articles of the SAE NEP in the reporting year		0,9	1,0	1,0	1,2

**Table 3. Financial model of the strategic academic unit**

	Fact* 2016	Plan			
		2017	2018	2019	2020
<b>TOTAL INCOME:</b>	<b>314</b>	<b>347</b>	<b>753</b>	<b>1 177</b>	<b>1 705</b>
<b>1. Budgetary sources</b>	<b>4</b>	<b>5</b>	<b>229</b>	<b>426</b>	<b>577</b>
1.1. Subsidy for state assignment	4	5	154	276	352
1.2. Subsidy for R&D activity state assignment					
1.3. Other subsidies and budgetary sources			75	150	225
<b>2. Non-budgetary sources</b>	<b>310</b>	<b>342</b>	<b>525</b>	<b>752</b>	<b>1 128</b>
2.1. Income from commercial education activity (tertiary education, pre-university courses, second degree and additional education, distance learning and other)	270	300	483	665	1 000
2.2. Income from R&D activity (scientific researches, consulting and analytic activities, including grants from RSF, RSCI and others)	40	42	42	87	128
2.3. Income from intellectual activity results using					
3. Other income					
<b>TOTAL EXPENDITURES:</b>	<b>314</b>	<b>346</b>	<b>745</b>	<b>1 176</b>	<b>1 674</b>
<b>1. Expenditures on some elements of governance sector</b>	<b>274</b>	<b>304</b>	<b>661</b>	<b>1 002</b>	<b>1 419</b>
1.1. Wage expenditures	184	202	436	670	1 119
1.2. Expenditures for equipment and row materials	25	27	51	76	100
1.3. Other operation expenditures	25	30	53	77	100
1.4. Capital investments	40	45	120	180	100
<b>2. Expenditures on StrAU research projects funding</b>	<b>40</b>	<b>42</b>	<b>84</b>	<b>173</b>	<b>255</b>
Direction 1: Artificial intelligence and data analysis in education			41	85	125
Direction 2: Virtual Education Platform	40	42	43	88	130
<b>3. Other expenses</b>					
<b>DEFICIT / PROFICIENCY</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>2</b>	<b>31</b>

\*model calculation in StrAU prerequisites