

**Priority Measures and Activities of the
Government Bodies for Enhancement of the IT
Sector in Serbia in 2019, with Report for 2018**

Council for Innovative Entrepreneurship
and Information Technologies

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ACTIVITIES REALIZED DURING 2018

Information-communication technology (ICT) sector is one of the largest sectors in Serbia, and one of the largest net exporters. According to the data of the National Bank of Serbia, in the first 11 months in 2018, export of ICT services surpassed the amount of one billion euros, with 27.5% growth compared to 2017. Surplus of ICT services export makes up majority of export surplus of services, while the sector itself has recorded continuous export growth over the past decade, amounting to over 20%. Net salary per employee in the ICT sector is over two times higher than that in other sectors of the economy, while one job in the ICT sector generates 4-5 jobs in other sectors. During 2018, significant efforts have been made in improving ICT sector in various fields:

Human Capital Development

One of the key measures for becoming part of processes of fourth industrial revolution was **introduction of computer information systems as a mandatory course** for all pupils starting from fifth grade of primary school. The first generation of fifth-grade pupils has been exposed to innovative computer information systems program by studying Scratch, sixth-grade pupils are currently learning programming skills in Python language, while in the seventh and eighth grade they will be working in Pygame and Jupyter, learning 2D animation, data analytics and management along the way.

For gymnasium (secondary school) students, number of **specialized IT classes** has been increased in gymnasiums. In 2018, significant increase in number of interested students was recorded, which lead to larger number of specialized IT classes that now number 44 classes in 36 gymnasiums, which is an increase of nearly five times relative to 2017. Computer information systems teachers working with specialized classes attend additional training for specialized data science courses. For secondary school students in technical schools, at the request of the industry and parents, **new profiles** have been introduced **according to dual education model**, namely: Technician for Digital Graphic and Internet Shaping, and Information Technology Electro-technician. In order to **improve teaching process at faculties** and to innovate courses, in compliance with the needs of the digital society, public bidding process has been realized to which 166 teams of teachers responded, while 66 of them received funds ranging from 250,000 to 1 million dinars. When selecting projects, particular emphasis was given to the degree to which programs increase usage of Information Technology in the teaching and learning process, to what degree they follow market needs and develop entrepreneurship skills of students and cooperation with other stakeholders in local community.

Citizens had the opportunity to gain programming knowledge and skills for the position of junior programmer within the Government's **IT requalification program**. The Program is open for

persons who are unemployed, as well as for those who want to change existing for better-paid jobs and jobs with greater prospects for career development. So far, 800 persons have been trained through the Program, and currently 700 unemployed persons are attending the training while in February training will begin for 411 persons in Belgrade, Novi Sad, Niš, Valjevo, Čačak, Subotica, Kragujevac, Novi Pazar, Užice and Zrenjanin.

Pilot project has been implemented since September last year regarding introduction of digital education material in 2,000 "digital classrooms", with selected teachers in the first and fifth grade of primary school taking part in the project. With the help of these materials, learning process becomes more efficient and more interesting to the children and students, thus presenting the advantages of new technologies.

In cooperation with the UNDP, a Program for Enhancement of Business Capacities of the Serbian IT Sector was initiated, with main goal to assist, with support of international experts, transition of the Serbian IT sector towards creation of its own products for the international market. The first visits of international experts have already been realized during last year, and during 2019 the Project will be further strengthened and expanded.

Building of Innovative Infrastructure

For the purpose of **improvement of innovative infrastructure**, significant funds have been earmarked, amounting to 70 million euros. Work has begun on construction of the Science Technology Park Niš, public procurement procedure is underway for hiring contractors for construction work at the building of Faculty of Electronic Engineering, as well as for designing the buildings of Biosense, Faculty of Organizational Sciences and Institute of Physics. In the end of 2018, the Council adopted the conclusion on supporting expansion of capacities of the Science Technology Park Belgrade for designing additional 16,000 square meters and construction of the first facility of 4,000 square meters, which will result in additional 300 jobs for engineers, as well as adaptation of the existing space in order to create modern laboratory and production line for hardware start-up companies. Council's conclusion also stipulates equipping of the Innovation Center of the Faculty of Electrical Engineering in Belgrade (ETF), in order to create 4 new modern laboratories, which will be applied in education, research and cooperation with the industry.

In order to boost regional development and provide opportunity to talented young people, public bidding process was successfully realized for supporting **establishment and development of regional start-up centers** in eight cities and municipalities in Serbia, amounting to 250 million dinars, while 2019 Budget stipulated additional support to new cities in the amount of 250 million dinars.

Competitive Market

After detailed comparative analysis of international practice in creation of a tax incentive environment, in the end of 2018 there were several significant amendments that were proposed and adopted to the Law on Personal Income Tax and Law on Corporate Profit Tax, which ensured **tax incentives** in Serbia as well.

Since 1st January 2019, costs relating to research and development of legal entities in Serbia will be recognized as expenditures for profit tax purposes in the amount two times higher than the actual costs.

Income on intellectual rights, primarily produced in Serbia, will be taxed at a decreased rate of 3%, instead of regular 15%. In order to motivate companies to invest into innovative start-up companies, thus providing them with necessary capital and professional knowledge for development, the right to tax credit was introduced amounting to 30% of invested amount into newly-founded company that conducts innovative activity. In tax balance sheets, all investments made by business companies into marketing activities will be recognized in full amount, instead of the past limit that restricted such recognition to 10% of revenues.

Taxation of received stock-options has been moved from income tax to capital gains tax at the moment of income realization, in order to relieve innovative companies and their employees of tax obligation until the moment of actual income generation on those options. Costs of employee recreation are also exempted of taxes and contributions.

On 1st October, exemption took effect on taxes and contributions for up to 9 employees in start-up companies if in the past six months they completed education or were recorded as unemployed for longer than six months at the National Employment Service.

During 2018, **approval procedure for clinical studies**, via process optimization and automation, was shortened from 6-9 months to 1-1.5 months, thus ensuring additional growth amounting to tens of millions of euros for the export-oriented activity, which enables Serbian doctors' and patients' access to the latest medicines and medical tools. In the end of the year, it was also ensured that import of unregistered medical tools, for the purposes of research and development made by members of science technology parks, beneficiaries of funds provided by the Innovation Fund, institutes and faculties, may be approved in just one day by the Medicines and Medical Devices Agency of Serbia.

ACTIVITIES PLANNED IN 2019

In 2019, the Council will continue to work on specific projects that will contribute to development of information technology and innovative entrepreneurship sector. The following are the key areas and initiatives of Council's activities in 2019:

Human Capital Development (formal and informal education)

1) Specialized IT Classes

Description of the activity:

Following a large interest of the students in entry to the specialized classes, the number of classes increased by a factor of five this year, and amounts to 44 classes in 36 gymnasiums across Serbia. It is expected that the interest will rise in the school semesters of 2019/2020, and that the number will be further increased. In the past period, trainings have been successfully realized for computer information system courses in the first grade of IT classes, and digital course materials were produced, which support courses in the first and second grades for IT classes.

Success rate of the educational program in classes of pupils with special skills in computer information systems includes highly competitive teachers, able to create dynamic and adaptive educational environment, and to ensure the best conditions for pupils' acquisition of computer science knowledge. In order to achieve this standard, it is necessary to strengthen computer information system teachers in implementation of teaching courses in the second grade: Programming (5 days), Operating systems (5 days) and Computer Application (2 days). In addition, it is necessary to draft digital education materials for computer information courses in the third grade of IT classes.

Estimated budget: 7,000,000 dinars (funds ensured with the Institute for the Improvement of Education (ZUOV))

Authority(ies) competent for realization: Ministry of Education, Science and Technological Development, Institute for the Improvement of Education

Realization time frame:

February - September 2019

- Creating appropriate professional development programs - February- March 2019
- Conducting training - April-September 2019

2) Implementation of Computer Information System Courses in 6th and 7th Grade of Primary School and 1st Grade of Gymnasium

Description of the activity:

Education and learning programs of the study course *Information Systems and Computer Science* in primary schools and *Computer Science and Information Systems* in gymnasiums stipulate that students do the programming in textual Python programming language. Computer information system teachers need to be additionally trained for high-quality realization of this educational topic and for achieving planned learning outcomes.

Estimated budget: 7,500,000 dinars (funds ensured with Institute for the Improvement of Education (ZUOV))

Authority(ies) competent for realization: Ministry of Education, Science and Technological Development, Institute for the Improvement of Education

Realization time frame:

November 2018 - February 2019

- Creating appropriate professional development programs - November-December 2018
- Creating appropriate material for standard and online training - November-December 2018
- Preparation of training for moderators, selection of moderators and training of moderators for training implementation
- Conducting training - January-February 2019

3) Introduction of a New Study Program of National Importance in the Field of Information Technology, Organization and Management

Description of the activity:

For the purpose of further development of education and faster economic growth, in addition to unemployment (in the third quarter of 2018, unemployment rate was 11.3%), investment into human capital represents a special challenge.

Existing education profiles and study programs do not adequately respond to the needs of the economy. According to the survey regarding needs of the Serbian IT sector, implemented by the Company Infostud in early 2017, 95% of IT companies reported facing difficulties in finding high quality IT experts. Also, survey on the sample of junior, medior and senior programmers, conducted by Start-it Organization in Serbia, shows that 29% of people working in the IT industry possess secondary school education.

Challenges like ratio of budget-financed and self-financed students, overburdening of teachers etc. that we come across at technical faculties in Belgrade, Novi Sad, Niš or Kragujevac may be overcome and decentralized with a national public bid notice, aiming to form a study program of strategic importance for Serbia, which would include the best and most interested parties.

Format of the National public bid notice would be similar to that of European Tempus and Erasmus+ projects, but would be developed in a public-private partnership between the Government of the Republic of Serbia and companies comprising Digital Serbia Initiative. The National public bid notice would include requirement to observe accreditation conditions prescribed by the law, an also special conditions that would be defined by companies (most important parts of the curricula and percentage of lecturers from the industry would be defined in advance).

Estimated budget: 11.000.000 dinars for drafting the program

Authority(ies) competent for realization: Ministry of Education, Science and Technological Development, Digital Serbia Initiative

Realization time frame:

January - October 2019

- Defining the text of public bid notice - January 2019;
- Public bid notice - January 2019;
- Selection of the Institution within which the program will be realized - April 2019;
- Termination of accreditation process - July 2019;
- Entry exam - September 2019;
- Entry of students - October 2019;

4) Introduction of Dual Education Profile - Technician for Safety of Information-Communication Systems in Air Traffic

Description of the activity:

The plan is to implement Project of introducing a common ICT structure, so that educational resources and documentation, stored in remote servers (Airbus, Boeing, EASA), would be available in the schooling process.

The Project also includes procurement of practical training system ("Airbus ACT Suite"), which ensures training by means of using three-dimensional airplane models and their components. System creates the feeling of virtual reality where the practical training is conducted, in compliance with the recommendations of the producer ("Airbus"). This type of training replaces working on airplanes, increases the quality of training and shortens its duration, is approved by the European Aviation Safety Agency and is currently the most modern way of implementing ICT technology in practical training.

Estimated budget: 11,000,000 dinars

Authority(ies) competent for realization: Ministry of Education, Science and Technological Development

Realization time frame:

- MESTD has submitted a request for development of the new standard
- Standard produced by the Institute for the Improvement of Education - March 2019
- Profile is available in the public bid for 2019/2020 - May 2019

5) Preparation and Implementation of Program "Schools for 21st Century"

Description of the activity:

"Schools for 21st Century in the Western Balkans" is a Program which is jointly implemented in the Republic of Serbia by the British Council and the Ministry of Education, Science and Technological Development. The Program includes training of teachers for conducting educational courses that encourage the development of students' critical thinking, problem solving and development of digital literacy. Each of the school, included into pilot stage of the Program, received 30 micro:bit devices (programmable digital devices, suitable for project type of education, encouraging functionalization of students' knowledge and significant change of education processes dynamics) and training regarding their programming. Pilot stage commenced in February 2018. Total of 25 schools was included, across the territory of the Republic of Serbia.

Owing to the donation of the British Government, the Program has been expanded to all primary schools in the region since October 2018. Program implementation will take three years, which means that all primary schools in the Western Balkans will receive training and micro:bit devices until the end of May 2021.

Given that the Republic of Serbia has a defined agenda, regarding introduction of computer information systems as a mandatory course in higher grades of primary schools, the Program *Schools for 21st Century* will be adjusted to the specific conditions in our country. Sector for digitalization in the field of education and science managed to change the initial conditions - need of our education system is to deliver micro:bit devices to schools until January 2020 at the latest (nearly one a half year before the rest of the region) and to use such devices in the course of computer information systems in the seventh grade of primary school. The number of devices in question is 36,000 that will be distributed to schools, depending on the number of students.

After completion of all trainings, the plan is to establish an online network of primary schools, which would, via mutual cooperation, exchange good practices examples and resolve potential challenges and problems. Regional student competitions are also planned based on the teamwork and real-life problem-solving. Within the Program *Schools for 21st Century*, training is also envisaged for the primary schools' principals. It will be designed in accordance with the needs of our education system (licensing of principals and focusing on the need to approach education digitalization systemically and responsibly).

Estimated budget: Project is financed by the British Council.

Authority(ies) competent for realization: Ministry of Education, Science and Technological Development, British Council

Realization time frame:

October 2018 - September 2021

- Start of Program implementation - October 2018;
- Establishment of the Working Group for preparation and implementation of the Program *Schools for 21st Century* - November 2019;
- Preparation of the program, selection of the trainer for principals' and teachers' training -

December 2018;

- Equipping all primary schools in the Republic of Serbia with micro:bit devices - March 2019 – January 2020;
- Online training of Computer Information System teachers in using micro:bit devices - March 2019 – January 2020;
- Training of 6 teachers in every primary school in the Republic for conducting educational courses that encourage the development of students' critical thinking, problem-solving and development of digital literacy - March 2019 – May 2021;
- Program evaluation - September 2021;

6) Introduction of Organized Visits to the Science Technology Park Belgrade for Primary and Secondary School Students

Description of the activity:

Initiative has been launched to include the Science Technology Park (STP) Belgrade into the list of destinations that may be visited by students when organizing excursions, in cooperation with the Ministry of Education, Science and Technological Development.

Past visits of the young people and events that targeted them to STP Belgrade generated very positive reactions among primary and secondary school students, because they had unique opportunity to see in one place how the young engineers work and develop their companies in Serbia, and how they translate their ideas into specific products.

Visits organized in future, where the young people would gain insight into the role of STP, development possibilities offered there, as well as various types of support they may rely upon in STP, may boost their interest in the field of engineering and encourage them to opt for technical faculties in large numbers.

Estimated budget: No additional funds required.

Authority(ies) competent for realization: Ministry of Education, Science and Technological Development, Science Technology Park Belgrade

Realization time frame:

January 2019 - no time limit

- Recommendation sent to schools by MESTD that STP Belgrade should be included in the list of destinations
- Realization of excursions - March-May 2019
- Realization of excursions - September-November 2019

7) Teachers' Digital Competence Development Program

Description of the activity:

Adequate need to use modern technologies in education provides incentives to develop critical thinking and guides students to independently research, discover and resolve problems, and to make decisions. There is ever more emphasis on using modern technology by both, teachers and students, in order to develop collaborative learning and learning connected to practical problems, real-life conditions and teamwork. A must-do in modern education is development of students' competences for getting by and learning after completed formal education. For that reason, students must be trained to actively use information sources, to think, analyze, enrich their experiences, make critical assessments and develop independence. Teachers and their additional education are in the center of such approach since they are actors who ensure high-quality education for all that participate in the education process. Hence, teachers are expected to possess appropriate level of digital competence. That means that additional teachers' education should be based upon reference framework for professional development and growth throughout career, which represents Digital Competence Framework - Teacher for digital age, which describes digital competences for teacher's profession, providing guidelines to teachers for using technology and providing incentives for creative thinking on how to use technology for learning and teaching.

By adopting Digital Competence Framework for teachers, requirements are met for systematic teachers' training in the sphere of digital literacy. The Framework needs to be revised, in accordance with the new developments in the digital education technology, and in accordance with the Digital Competence Framework for Educators, published by the European Commission in the end of 2017.

Institute for the Improvement of Education has, through implementation of pilot project and valuation of instruments for self-assessment and digital maturity assessment of institutions SELFI, ensured conditions for supporting, planning and procurement of ICT equipment and infrastructure in schools based on the actual needs. Via training of teachers for reaching at least basic level of digital literacy, in accordance with the Digital Competence Framework for Teachers, and via training for implementation of SELFI instruments for administration, teachers and students, institution's self-assessment process will gain a new dimension and will ensure high-quality development planning.

Estimated budget: 21,480,000 dinars (funds ensured with Institute for the Improvement of Education (ZUOV))

Authority(ies) competent for realization: Ministry of Education, Science and Technological Development, Institute for the Improvement of Education

Realization time frame:

January - December 2019

- Revision of Digital Competence Framework for Teachers - January-June 2019
- Training of 3,600 teachers for achieving basic level of digital competence – September - November 2019

8) "Digital Textbooks" and "Connected Schools"

Description of the activity:

Development of modern digital technology has opened up new possibilities to improve education process. Digital educational content was created that, in conjunction with digital technology, enable students to better and deeper understand stipulated educational program, while making their knowledge significantly more applicable in future life and work, wherein teacher changes the role, guiding the student through a learning process, instead of the past approach that included transfer of knowledge. This paradigm shift in education is necessary, in order to keep up with the leading countries and ensure preconditions for ensuring more competitive economy globally.

In accordance with the above-mentioned, pilot project was realized previous year as well, with allocated funds amounting to 307,200,000 dinars, when 2,000 digital classrooms were equipped with accompanying educational content, and with 2,000 teachers trained for using the procured equipment and content. This year, funds were allocated for the same purpose for equipping 8,000 classrooms with digital equipment and material, and also for teachers' training for using such equipment and material in education process.

As an infrastructural basis for the mentioned activities, a comprehensive improvement of information and communication infrastructure was envisaged in all primary and secondary schools. The project is designed so it would cover two crucial segments of information and communication infrastructure in education, namely: improvement of central communication infrastructure and construction of local wireless communication infrastructure (WLAN) in schools.

Estimated budget:

Estimated budget will be realized in a three-year period, namely from the following sources:

50 million from EIB funds

50 million euros from Republic of Serbia's budget

Budget funds are allocated in the following manner:

2018: 5 million euros

2019: 8 million euros (MESTD) and 2 million euros (MTTT)

2020 and 2021; 35 million euros (MTTT)

Authority(ies) competent for realization: Ministry of Education, Science and Technological Development, Ministry of Trade, Tourism and Telecommunications (MTT), Institute for the Improvement of Education

Realization time frame:

Training for teachers

- Drafting detailed project time frame: January 2019
- Training for teachers: March - August 2019
- Building of ICT Infrastructure: March - December 2019
- Drafting of project task, negotiations with EIB and loan contracting: January 2019 - September 2019

- Procurement and distribution of equipment: February - September 2019
- Procurement and distribution of digital content: June - September 2019

9) IT Sector Requalification Program

Description of the activity:

Following the success of the pilot trainings for 100 participants, requalification for additional 700 participants was successfully realized. Currently, requalification program is underway for 700 unemployed participants, while in February training will begin for 411 participants. Project goal is to provide IT knowledge and skills, in order to increase number of employees in the Serbian IT sector. In accordance with the needs of IT companies, capacities of schools conducting training and time frame of employment of participants that attended the training, the project will continue in the second half of 2019.

Authority(ies) competent for realization: Ministry of Labor, Employment and Social Policy, Office for Information Technologies and Electronic Government

Realization time frame: Monitoring participants' employment

Development of Innovative Infrastructure

10) BioSense Institute

Description of the activity:

"BioSense" is one of the leading European scientific and research institutes, dedicated to modern applied and market-oriented researches in agriculture and food. BioSense was ranked No. 1 in Europe for the "Antares" project, within the Invitation "Horizon 2020 - Timing", aimed at creation of the European Center of Excellence in Scientific researches. Budget of the "Antares" Project was 28 million euros, out of which 14 million euros were EU grants, while 14 million euros were secured from the Project "Research and Development in Public Sector", financed from the funds of the European Investment Bank and Council of Europe Development Bank.

Estimated budget: 28 million euros (14 million euros from the Horizon Program, 14 million euros from the European Investment Bank loan)

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development, Office of the Minister without Portfolio responsible for innovation and technological development, Public Investment Management Office

Realization time frame: Completion of activities in 2020.

11) Science Technology Park Novi Sad

Description of the activity:

Phase II of the Science Technology and Innovation Park Novi Sad is continuation of the construction of the building with 29,134.50 square meters, out of which 9,000 square meters will belong to the Faculty of Technical Sciences of the University of Novi Sad. This Project has already been initiated with the funds from the Project "Research and Development in Public Sector", financed from the funds of the European Investment Bank in the amount of 12 million euros. Initial project stipulated construction of 19,000 square meters up until rough construction works stage, and additional funds have been secured from the Budget of the Republic of Serbia, amounting to 200 million dinars in 2018 and 640 million dinars in 2019 for completion of works on the entire object. It is necessary to fully implement concept change, bearing in mind that overall planned net surface of the Science Technology and Innovation Park Novi Sad of 29,135.50 square meters will consist of 6 levels, including the entrance hall, connecting parts and pathways, and that it will be organized in the following manner:

- 4,000 square meters for start-up and smaller companies, activity of which is related to innovative, developmental and research activities;
- 3,500 square meters for "R&D" sectors of developed companies;
- 9,000 square meters for education and research work of the Faculty of Technical Sciences (FTC) Novi Sad, out of which 2,000 square meters will be dedicated to amphitheatres, conference halls, multimedia and video halls, and exhibition space, used by FTC Novi Sad, University of Novi Sad and Science Technology and Innovation Park (STIP) Novi Sad;
- 4,000 square meters for science & research institutions of special importance for the development of Autonomous Province of Vojvodina, and/or institutes and companies that are already developed and important for Novi Sad and Vojvodina, where such researches may be used for development of new products and services within STIP (for instance, institutes in information technology, food technology, development of new material and products etc.);
- 4,971.50 square meters for Co-working space, which includes halls, social space, banks, companies providing supporting services etc. with restaurant that would work 24/7, gym and office space for "Core Innovation Accelerator Team", which will provide support and ensure unhindered functioning of the Park, where the most important managerial offices are located from which start-ups and companies would benefit the most: finance director, legal counsel, operating development director, marketing director, technology manager and accounting manager;
- 3,663 square meters for garages and basement area.

In compliance with the concept, it is necessary to draft specification and ensure adequate equipment for future users of the phase II of Science Technology and Innovation Park Novi Sad.

Estimated budget: 640 million dinars for 2019

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development, Office of the Minister without Portfolio responsible for innovation and technological development

12) Science Technology Park Niš

Description of the activity:

Construction of Science Technology Park Niš, which will provide space of around 14,000 square meters for training of students for using advanced technology and learning through practices. The space will also contain business incubator for around 30 start-up companies, while there will also be a separate space for research and development of products of larger companies.

Estimated budget: 10 million euros (European Investment Bank loan)

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development, Office of the Minister without Portfolio responsible for innovation and technological development, Public Investment Management Office

Realization time frame: Construction began in November 2018, deadline for completion of work is February 2020

It is necessary to establish Limited liability company in charge of management of STP until July 2019

13) Upgrading the Building of Faculty of Electronic Engineering in Niš

Description of the activity:

Expansion of the Faculty of Electronic Engineering of the University of Niš by means of construction of multi-functional Annex to the Faculty, with 6,950.38 square meters, equipped with new generation laboratory equipment. This expansion will ensure increase of capacities of the Faculty for applied researches in new technologies, as well as for incubation of larger number of innovative entrepreneurship endeavors. Two centers of excellence will be established, one for 3D technologies and one for augmented reality.

Estimated budget: 5 million and 200 thousand euros (European Investment Bank loan)

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development, Office of the Minister without Portfolio responsible for innovation and technological development, Public Investment Management Office

Realization time frame: Expected start of work is February 2019, deadline for completion of work is 10 months

14) Faculty of Organizational Sciences (FON)

Description of the activity:

It is necessary to find a long-term solution for lack of spatial capacities, by constructing new facility for FON in Serbia and region. Project of constructing a new facility includes construction of the new facility, where new amphitheatres would be housed, along with computer classrooms, centers etc, with gross space of 7,500 square meters (two levels of garages and annexes with gross space of 4,277.4 square meters and a facility with 4 floors plus attic, with gross space of 3,342.24 square meters). That would bring about better use of the existing building for organizing education process with application of the most modern methods and significant participation in the IT community ecosystem. Estimated value of construction works and building equipment is 5,5 million euros. In that way, conditions would be created for significant increase of capacities, and FON would be able to accept 750 students, instead of 430 students currently in the Department of Information Systems and Technologies. In this way, FON will produce 550 computer information system engineers annually, instead of 260.

Estimated budget: 5 million euros (European Investment Bank loan)

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development, Office of the Minister without Portfolio responsible for innovation and technological development, Public Investment Management Office

Realization time frame: Completion of activities in 2021.

15) Institute of Physics - Verokio

Description of the activity:

Verokio Project of the Institute of Physics in Belgrade, together with strategic partners - leading international centers such as CERN, INFN (National Institute for Nuclear Physics) and DESY (Germany's largest accelerator center) and Research Station Petnica - aims to connect existing expertise in the field of supercomputers; modeling complex systems; collecting visualization and analysis of Big Data; development and application of new non-invasive measurement systems; and to focus such expertise on solutions to specific problems regarding development of new generation of accelerators and detectors, and/or on solutions to social challenges in the fields such as archeology, sociology and biomedicine.

In accordance with the signed Contract on project realization, construction of the facility is planned, with 3,000 square meters of space, along with facility for production of prototypes, with 1,000 square meters of space.

Estimated budget: 5 million euros (European Investment Bank loan), while the remaining amount is provided by the international partners (5 million) and property of the Physics Institute (1 million).

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development, Office of the Minister without Portfolio responsible for innovation and technological development, Public Investment Management Office

16) Expansion of Capacities of STP Belgrade

Description of the activity:

Science Technology Park has been developing much faster than planned, with tendency of continuous growth; hence, it is necessary to start with expansion of existing capacities. One should bear in mind continuous growth of both, high-tech companies in STP Belgrade, and the need of the country to increase number of start-up companies. After just two years of operations, there are 60 companies operating in STP Belgrade, employing nearly 500 engineers. The very fact that only in 2016, in the first year of Park's operations, companies recorded income of 10 million euros, out of which 60% came from export, and that more than 2 million euros have been paid back to the Budget, it speaks of the potentials available for the development of the country,

Strategic commitment of the Serbian Government is to invest into further development of STP, namely in new 4 facilities amounting to 16,000 square meters. Construction of this complex would create conditions for employment of additional 1,200 engineers. The first phase of the project consists of drafting project documentation for the entire complex and construction of the new facility of 4,000 square meters, where 300 engineers would find jobs. In conjunction with the new complex, the Serbian Government will support completion of the facility in rough construction works stage of 1,000 square meters, thus ensuring formation of the production line for hardware oriented start-up companies and additional content that would ensure whole-day stay in the Park.

Estimated budget: 4.5 million euros (European Investment Bank loan)

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development, Office of the Minister without Portfolio responsible for innovation and technological development, Public Investment Management Office

17) Program of Supporting and Promoting Women Innovative Entrepreneurship

Description of the activity:

In accordance with the data from the National Strategy for Gender Equality 2016-2020, men still hold dominant role in the business sector in management positions and as owners and founders of small and medium companies (77.9%), while women are most often owners of shops (34.3%) and medium business companies (22,1%).

Implementation of this Program, and/or **promotion of women innovative entrepreneurship** at the national and local level, as well as **enhancement of women innovative entrepreneurship** at the local level, raises awareness on importance of women innovative entrepreneurship, level of information on measures undertaken by the Government of the Republic of Serbia in order to assist women innovative entrepreneurship, and it also ensures achievement of more significant role of women entrepreneurs at the labor market through development of their operations, employment of larger number of people and achievement of larger and sustainable revenues.

Program of Supporting and Promoting Women Innovative Entrepreneurship puts forward support to women innovative entrepreneurship as the highest priority, and provides significant incentives to development of social awareness, and creates necessary conditions to change the business environment; it also aims to have larger number of women founders, owners or shareholders of business companies in activities of business companies and entrepreneurs.

General aim of the Program is systemic improvement of innovative entrepreneurship among women through promotion and affirmation of women innovative entrepreneurship, direct support to realization of their entrepreneurship ideas, as well as development of entrepreneurship abilities and capacities of women.

In the first cycle of the Program implemented during 2018, support was provided to implementation of 17 projects, totaling 100,000,000.00 dinars, to the following local governments: City of Zaječar, City of Novi Sad, City of Belgrade – Youth Office, City of Leskovac, City of Loznica, Municipality of Sremski Karlovci, Municipality of Vladičin Han, Municipality of Topola, Municipality of Kosjerić and Municipality of Mali Zvornik, as well as to local governments cooperating with organizations: City of Novi Sad and Students' Association of the University of Novi Sad, City of Novi Sad and Association THE BEST FEST, City of Novi Sad and Citizens Association Factory of Knowledge and Preservation, City of Belgrade and Interlink business d.o.o, City of Belgrade and Domino DOO, City of Kikinda and "Panonska Inicijativa" and Municipality of Varvarin and Womens' Association "Kaliopa" from Brus.

Statistically speaking, direct material support was received by over 200 women, over 2,500 women attended various trainings, education and online courses, and 10 conference, education events, fairs and roundtables were held on women innovative entrepreneurship in cities across Serbia.

Estimated budget: Estimated budget for the Program of Supporting and Promoting Women Innovative Entrepreneurship for 2019 is 100,000,000.00 dinars.

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development.

Realization time frame: Public bid notice regarding awarding grants within the Program of Supporting and Promoting Women Innovative Entrepreneurship in the first quarter of 2019. After that, it is planned to hold sessions of the Commission for assessment of bids and monitoring of implementation of the Program of Supporting and Promoting Women Innovative Entrepreneurship, and it is also planned to award funds for approved projects to local government units or organizations.

18) Program for Providing Support to Opening of Regional Innovation Start-up Centers

Description of the activity:

Innovations, in majority of countries, focusing on conditions for development of innovation ecosystem, represent an economic issue. In the previous analyses of the state of innovation potential in the Republic of Serbia, it was determined that there is capacity for the development of innovation in local communities, and that fact should be used as a starting point for the development of network of regional innovation start-up centers. That would have positive impact on harmonizing conditions for all individuals and institutions, working in the field of innovation, and contribute to a more balanced economic development of the country.

Regional start-up centers **will represent e network of organizational units that, together with similar centers in Belgrade, Novi Sad and Niš, comprise the innovation ecosystem.** regarding the entrepreneurship sector in the Republic of Serbia.

General goal is systemic improvement of innovation ecosystem in the entire territory of the Republic of Serbia, through supporting opening of regional innovation start-up centers. Ultimate goal is to provide necessary conditions and equal chances for realization and development of innovative entrepreneurship ideas in all parts of Serbia.

Taking into account similar practices in countries that are global leaders in innovation and entrepreneurship, the plan is to create conditions for start-up community where **young entrepreneurs would have professional, mentor, legal, counseling and logistical support to start and run a business.** Growth and development of innovation-based entrepreneurship is a significant generator of new jobs in local environment, so that positive effects are expected in that field as well.

In the first cycle of the Program, implemented during 2018, **support was provided to 8 projects, totaling 249,996,629.81 dinars, to the following local governments and organizations:** City of Kruševac and Business Incubator from Kruševac, City of Pirot and Zip Center for Young – Business Incubator from Pirot, City of Subotica and Faculty of Economics in Subotica, University of Novi Sad, City of Čačak and Science Technology Park Čačak, City of Gornji Milanovac and Citizens Association for development of technological entrepreneurship ICT Hub from Belgrade, City of Valjevo and Business Incubator from Valjevo, City of Zrenjanin and Association SEE ICT from Belgrade, as well as to Municipality of Stara Pazova and Regional Development Agency Srem from Ruma.

Estimated budget: Estimated budget for opening regional innovation start-up centers for 2019 is 250 million dinars.

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development.

Realization time frame:

- Opening regional innovation start-up centers from 2018 in the first quarter of 2019.
- Public bid notice regarding awarding grants within the Program for Providing Support to Opening Regional Innovation Start-up Centers in the first quarter of 2019.
- After that, the plan is to organize sessions of the Commission for control of implementation of

the Program for Providing Support to Opening of Regional Innovation Start-up Centers, as well as to award funds for approved projects to local government units and organizations.

Competitive Market (legal framework for business activities)

It is very important that conditions for business activities of IT companies in Serbia are competitive, in order for IT companies to register their headquarters in Serbia and run their global businesses from Serbia. IT companies are specific because they may easily change their headquarters, and thus their legal and tax operating framework, and for that reason it is important to retain IT companies in Serbia with improved competitive operating conditions in our country, in addition to other measures.

Ministerial Council for Innovative Entrepreneurship and Information Technologies will continue to implement activities on improvement of framework for innovative IT companies operations primarily through improvement of legal framework, while introduction of incentive mechanisms will also be considered.

19) Full Application of Tax Incentives for Knowledge Economy

Description of the activity:

In December 2018, with the amendment to the Law on Corporate Profit Tax and Law on Personal Income Tax, a set of tax incentives was introduced, aiming to boost faster development of domestic companies, particularly innovative companies in knowledge economy. Adopted incentive measures include the following:

- Recognition of costs for research and development in the amount two times higher than the actual costs (R&D tax credit)
- Lower taxation of revenues, realized based on intellectual property rights down to 3% instead of 15% (IP Box).
- Tax credit for investment into new innovative companies
- Recognition of marketing costs in full amount
- Changed taxation of employee stock option from income tax to capital gains tax at the moment of sale
- Tax exemption regarding employee recreation costs

During the first quarter of 2019, bylaws will be enacted which would define, in more detail, mechanism for realization of the mentioned incentives, training will be conducted of Tax Administration employees and accountants who will apply such incentives, along with broad promotion campaign in order to ensure that large number of eligible companies use such incentives.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Finance

20) Adoption of Law on Alternative Investment Funds

Description of the activity:

We will adopt a Law on Alternative Investment Funds, which will regulate, among other things, registration and operating model of so-called Venture Capital Funds, highly important for the development of innovative and high-tech companies. After adoption of the Law, adequate tax treatment of mentioned investment funds will be ensured.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Finance

21) Ensuring the Work of Platforms for Group Financing by Large Number of Persons (*crowdfunding*) and Adequate Promotion thereof

Description of the activity:

Crowdfunding platforms are popular way of financing innovative companies, due to simplicity and speed of acquiring funds in this manner. It is necessary to ensure work of these platforms in Serbia also, and to adequately promote their usage as one of the mechanisms for ensuring funds required for development of operations.

Estimated budget: No additional funds required.

Responsible body: Ministry of Finance and the National Bank of Serbia

22) Improving Incentives Regulation regarding Using Stock Options so that it could be used as an Employee Stimulation Mechanism

Description of the activity:

After improvement of tax framework for using stock options, it is necessary to change the Business Companies Law and Law on Capital Market and remove existing limitations for awarding stock options of non-public stock companies, and also to cancel barriers for awarding stocks of foreign business companies.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Economy, Securities Commission

23) Incentive for Development of Electronic Commerce in Serbia

Description of the activity:

Electronic commerce has been recording constant growth globally, including the Republic of Serbia. In the domestic market, there is an increasing number of business companies offering goods/services via Internet, while shipment is made both within Serbia and abroad. Electronic commerce provides opportunity to domestic business entities to operate in the global market, as well as to participate on equal basis in a competition with foreign traders.

Precisely for that reason, regulations should be defined so that it would enable modern operations of e-traders in Serbia and from Serbia to do business globally, and incentives schemes should be implemented that would have positive effects on SME operations and opening their goods and services to foreign market, which will also bring about increase of gross domestic product in the Republic of Serbia.

Through amendment to the Law on Trade and Law on Electronic Commerce, specificities of electronic commerce will be recognized and legal safety will be ensured, particularly in case of managing one electronic shop for global market.

Design and realization of incentive schemes will be considered for start-ups, entrepreneurs and SME in general, which would be reflected in:

- Funds or specific technical and/or professional assistance over the period of 12 months and, depending on the scope of assistance, from 1,000 to 3,000 entrepreneurs/legal entities would be included.
- Subsidized prices of postal costs for sending goods/packages to a buyer abroad, as well as simplified customs procedure.

Estimated budget: For incentive schemes, around 1 million euros should be provided.

Responsible body in the Government of the Republic of Serbia: Ministry of Trade, Tourism and Telecommunications

24) More Precise Regulation of Software Copyrights

Description of the activity:

Amendment to the Law on Copyright and Related Rights will define, in more detail, rights regarding software, and it will eliminate potential legal uncertainty.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Intellectual Property Office, Ministry of Education, Science and Technological Development.

25) Simpler and More Detailed Procedure for Flat-Rate Tax

Description of the activity:

Existing procedure for determining amount of flat-rate tax is non-transparent and inefficient. Amendment to the Decree on Detailed Conditions, Criteria and Elements for Flat-Rate Taxation of Income From Individual Activities will make the mentioned procedure and issuing of tax statements simplified and automated.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Finance

26) Providing Public Organizations with Opportunity to Purchase Innovative Solutions

Description of the activity:

Amendments to the Public Procurement Law will enable the state and public organizations to acquire innovative business solutions more easily, to be primary clients and key references that will further improve global competition of domestic IT companies.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Finance

27) Regulating Blockchain Economy

Description of the activity:

At the moment, there is no regulation regarding digital property, its storage, access and tokenization. Also, KYC/AML regulations define identification and rules for cryptocurrency exchange with insufficient clarity and are very restrictive. In addition, legal treatment of "smart contracts" is insufficiently clear, as is the tax treatment of crypto-economy. Payments in cryptocurrency have not been defined either. By adoption of adequate regulations, we will create incentive environment for usage of blockchain tokens, "smart contracts" and cryptocurrencies.

Estimated budget: No additional funds required.

Responsible body: Ministry of Finance, National Bank of Serbia, Securities Commission, Ministry of Trade, Tourism and Telecommunications, Ministry of Economy

28) Regulating VAT in Sale of Digital Products

Description of the activity:

Current regulations do not clearly define whether value-added tax is paid and, if so, in what amount it is paid, when the buyer's residence is unknown, which creates dilemmas with recording VAT when conducting online sale. In order to achieve legal certainty when selling, and/or exporting digital products, it is necessary to define clear rules for assumptions of buyer's residence and determining VAT amount.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Finance

29) Providing Digital Companies with Opportunity to Issue Digital Textbooks

Description of the activity:

Acquiring approval to use digital textbooks in education is, according to current regulations, limited only to companies registered for conducting publishing activities. That limits competition and potentially affects the quality of the textbooks. It is necessary to change relevant regulations and enable IT companies to become equal player in the digital textbooks market.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development

30) Facilitating Employment of Foreign Citizens

Description of the activity:

Given the chronic lack of domestic IT experts, particularly senior-level experts with specialized knowledge, it is necessary to simplify, define in more detail and speed up the residence and work permit approval process for foreign citizens in Serbia. In addition, changes need to clearly define criteria that should be met for living and working in Serbia, particularly for smaller investors and entrepreneurs, so that foreign citizens, when making decisions, would be fully informed about their rights and obligations.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Interior, Ministry of Labor, Employment, Veteran and Social Policy.

31) Introduction of Tax Credit for Investments into Intangible Assets

Description of the activity:

Introduction of tax incentives will be considered in detail for digitalization of largest part of economy and stimulating internal software market for IT companies.

Estimated budget: No additional funds required, while fiscal effects will be considered in detail.

Responsible body in the Government of the Republic of Serbia: Ministry of Finance

32) Tax Exemption from Paying Taxes and Contributions for Innovative Start-up Companies

Description of the activity:

Given that the Law on Corporate Profit Tax recognizes companies dealing with innovative activities, possibility will be considered in detail to ensure that these legal entities may use start-up business incentives, and/or tax exemption from paying taxes and contributions for founder and up to 9 employees.

Estimated budget: No additional funds required, while fiscal effects will be considered in detail.

Responsible body in the Government of the Republic of Serbia: Ministry of Finance

33) Opening Data in the Health Care Sector

Description of the activity:

Health care system possesses large data sets, analysis of which may produce statistical data/information crucial for making decisions on improvement of the system and quality of services offered to the beneficiaries. At the moment, existing Draft Law on Health Care does not cover the issue of Open Data and usage thereof. In order to provide the general public with possibility to use different data sets, which are designed to be statistical analyses, without jeopardizing personal data, it is necessary to consider such possibility in the Law on Health Care as well. Open Data represent a basis for creating different applications/services that would significantly facilitate and improve lives of the citizens.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Ministry of Health.

34) Opening Google Merchant Account and App Store in Serbia

Description of the activity:

Government of the Republic of Serbia, in cooperation with the *Serbian Entrepreneurs* from USA, has contacted competent persons from the companies *Google* and *Apple*, so that these companies may open up opportunity to Serbian citizens and software companies to register, purchase and sell their application via their platforms (co-called *Google Merchant Account* for Serbian companies with *Google*, and/or *App Store* with *Apple*).

Estimated budget: Budget not required.

Responsible body in the Government of the Republic of Serbia: Prime Minister's Office.

35) Participation of Serbia in Blockchain Initiatives for Artificial Intelligence

Description of the activity:

During the visit of the European Commissioner for Digital Economy and Society, Ms. Mariya Gabriel, Serbia expressed its wish to be one of the signatories of the Declaration of Cooperation on Artificial Intelligence and Declaration Creating the European Blockchain Partnership. The plan is to start the initiative, with close cooperation with the EU Delegation to Serbia, in order to make Serbia a signatory of these declarations.

Serbia will become member of the European Artificial Intelligence Alliance and EU Blockchain Observatory and Forum.

Estimated budget: No additional funds required.

Responsible body in the Government of the Republic of Serbia: Prime Minister's Office, Ministry of Trade, Tourism and Telecommunications, Ministry of Education, Science and Technological Development.

INITIATIVES OF THE MEMBERS OF THE COUNCIL

1) Support to the Development of Science Technology Park Čačak

Description of the activity:

STP Čačak was established in 2011 by the City of Čačak, Faculty of Technical Sciences, Agro-Economic Faculty, Fruit Research Institute, Business Association "Gradac 97" and Association of Private Companies and Entrepreneurs "Unija Čačak 2000". Over the past years, STP has developed and gained trust of the local community in conducting infrastructural activities and professional support to innovations and start-up companies. STP Čačak encourages development of new products and technologies, transfer of technology and innovation to economy, commercialization of scientific research results and ensuring opening of new jobs. STP Čačak provides support to 20 start-up companies, 60 new jobs have been opened, with evident success at technology innovation competitions on both national and international levels, as well as in organization of more than 70 events aimed at development of entrepreneurship with the young people. Development of STP Čačak is supported by the City Administration, local economy, faculties, which provides solid basis for continuation of the Park's activities and its rapid development in providing incentives to digitalization of product industries as well, which already operate in Čačak. However, the main problem and obstacle in further development is the lack of business premises, which hinders increase of start-up companies that would use the services of the Park. Interest is high and 20 start-up companies, that are currently waiting to be housed, would create more than 150 new jobs in the first year of operations. Ensuring and equipping new business premises for the purposes of business incubation would strengthen capacities of the organization to create and boost innovation companies, providing the opportunity to young experts to remain in Čačak and apply their knowledge in the development of local economy.

In order to prepare content and to move into the new building of STP, memorandum of cooperation was signed in 2018 among secondary schools, businessmen forum and higher school of professional studies, and presentation of STP Belgrade was organized for pupils and students. Besides, STP Čačak has received award at the public competition regarding supporting regional start-up centers and, as of March, it will open the space with 700 square meters for young people, business beginners and innovation companies. Start-up center will also serve as an incubator, and/or preparatory stage for companies to move into STP.

Expansion of spatial capacities of STP Čačak may be realized in two ways.

A) Taking over management and usage of the location Tehnos (cadastral No. 5751/15 (6,930 m²), cadastral No. 5751/14 with objects 1 and 2 (6,488 m²) and cadastral No. 5751/10 with objects 1, 2 and 12) owned by the City of Čačak. The required space has 5,500 m² erected on the land of 3.5 acres in size.

After cleaning up the site and realization of the urban development plan, construction and reconstruction of objects would be implemented in phases. After new business companies move into the objects, conditions would be created for opening 300 new jobs.

Adaptation time frame and project realization is 24 months.

B) Purchase of the equipped office space at the location "CER", which could house new business

companies, which would create conditions for opening 500 new jobs.

Realization time frame is 6 months at the latest.

Estimated budget: It depends on the selection of the manner of realization, namely:

A) City of Čačak makes investment into land and complete infrastructure, in the amount of 2,500,000 euros, while participation of the Republic in construction and adaptation of existing objects should be 3,500,000 euros.

B) In case of purchasing erected objects at the location CER, the City of Čačak would invest 1,000,000 euros, while participation of the Republic should be 3,000,000 euros.

Responsible body in the Government of the Republic of Serbia: Ministry of Education, Science and Technological Development, Office of the Minister without Portfolio responsible for innovation and technological development

Realization time frame: In 2018, Decision should be adopted by the Council for Innovative Entrepreneurship and Information Technologies regarding which of the two ways will be selected for project realization, and accordingly decision will be made on the manner of securing required funds - from European Investment Bank loan or from another loan, and/or donation or from other sources, in order to start with construction works during 2018.

2) Establishing the First "Boiling Point" in Serbia

Description of the activity:

Innovation and digital technologies have brought about trend of transformation to traditional industries in terms of change of products, processes, organizational parameters, and also market performances affected by innovative solutions that create new value, thus affecting expectations from the users and requiring completely new business models.

Interaction among representatives of all groups of innovation ecosystem players, who are the pillars of this change process, is the key factor for identifying opportunities for creation of new value and strong growth of not only companies, but entire economies as well; for those reasons, the state needs to provide support to this process.

This process may be realized by using the concept "Boiling Point" (Russian: Точка кипения) which is implemented in the Russian Federation under the personal sponsorship and monitoring of the President, Mr. Vladimir Putin, which represents a network of dedicated hubs throughout Russia, where innovation, science, education, business, start-up companies and investors meet up in a visionary manner. Those are joint working places where young people gather and work, with research and scientific potentials and entrepreneurship ambitions. In such places, lectures of some of the best Russian and international speakers are organized, ideas are exchanged, knowledge is acquired, and successful and - sometimes even more importantly - initially unsuccessful entrepreneurs' ideas are exchanged. In "Boiling Points", young engineers may receive the best mentorship support in developing their entrepreneurship initiative in various sectors, and bring it from the phase of idea to commercial phase in the market. Such concept is accompanied with digital platform, which contains over 10,000 lectures and other entries on events organized in "Boiling Points".

Russian side has expressed readiness to provide support to the Republic of Serbia in realization of the Project "Boiling Point" in Serbia, which will be the first digital hub of that kind outside Russia. Namely, during the official visit of the President of the Russian Federation, Mr. Vladimir Putin, to the Republic of Serbia on 17th January 2019, a Memorandum of Understanding was signed between the Office of the Minister without Portfolio responsible for innovation and technological development of the Government of the Republic of Serbia, and Agency for Strategic Initiative (ASI), Russian Venture Company (RVK) and VEB Innovations Fund from the Russian side, regarding cooperation in the field of innovation and technological development. The mentioned Memorandum stipulates that the parties will invest joint efforts to support the project that includes special virtual-physical platform of "Boiling Point", in accordance with the needs of the innovation ecosystem in the Republic of Serbia and organizational practices and activities of the format "Boiling Point" in the Russian Federation.

Establishment of "Boiling Point" in Serbia is an excellent opportunity for the innovation ecosystem in Serbia and its start-up community. In addition to supporting development of business activities in line with the best methodology, "Boiling Point" also represents access point to the network of the most successful Russian companies and investors.

Estimated budget: Estimated budget for establishment of the first "Boiling Point" in Serbia is 2 million euros. It is necessary to adopt a decision on the manner of securing funds in the shortest possible deadline.

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development, in cooperation with the Agency for Strategic Initiative of the Russian Federation.

Realization time frame: In the coming period, work will be conducted on finding adequate physical space for the first "Boiling Point" in Serbia. Also, multi-disciplinary team will be formed which will work on surveying key stakeholders, in order to determine the needs within the innovation ecosystem, based on which "Boiling Points" would set the list of priorities.

At the same time, work will be conducted on tailoring digital platform "Boiling Point", so that it could adequately be used in the Serbian language and all materials will be available to Serbian users.

The plan is to open the first "Boiling Point" in Serbia in April 2019.

3) Establishment of Materials Laboratory and Construction Laboratory at the Faculty of Civil Engineering of the University of Belgrade

Description of the activity:

Construction Materials Laboratory is the center of development of young researchers, who are the pillars of scientific, educational and professional activities at the Faculty of Civil Engineering, and which can become a key point for directing the most innovative staff towards technological entrepreneurship. The Laboratory has been accredited by the Serbian Accreditation Body, according to the Standard SRPS ISO/IEC 17025:2006, for physical and mechanical testing of construction materials, testing of construction structures and mechanical testing of metal materials.

From 2011 until 2017, various experiments were conducted in the Construction Materials Laboratory within the research which represented innovative solutions in the field of construction materials and their application in structures, and also in the field of technological solutions facilitating/reducing the cost of processes in designing structures and making them sustainable. Construction Materials Laboratory is an incubation center where existing knowledge and skills of the teaching staff are combined with the new ideas of the young researchers.

The main lack of the Laboratory is the fact that **there is no specialized strong floor and reaction wall**, which are key elements of the construction testing facility, and which represent a precondition for setting various dispositions for testing structures on static and dynamic pressure.

Equipping the structures testing facility with erected strong floor and reaction wall would also include the procurement of:

1. Universal testing machine, with capacity of 1000 kN,
2. Horizontal pressure actuator, with capacity of 250 kN,
3. Instruments for optical measurement and video correlation,
4. System for data collection.

There is not a single scientific and research organization in the Republic of Serbia that has plans for equipment of the facility, so ensuring this type of laboratory infrastructure and equipment, with existing scientific excellence and human capacities, would make the Faculty of Civil Engineering a **regional center for innovation activities in the field of civil engineering profession and techniques**.

Bearing in mind the achieved results and targeted raising of the *Technology Readiness Level to TRL5-TRL6*, duration of construction materials has been defined as a high-priority research area, along with assessment of construction's life span. For that purpose, **the procurement of following instruments and laboratory equipment was planned:**

1. Accelerated aging chamber,
2. Alkali-Silica Reactor,
3. Equipment for permeability construction testing,
4. Equipment for rheological testing of materials,
5. Equipment for testing of construction to corrosion, due to chloride effects.

That would also require inclusion of researchers from the similar scientific disciplines and faculties such as Faculty of Architecture, Faculty of Mechanical Engineering and Faculty of Technology and

Metallurgy.

Estimated budget: Estimated budget for establishment of the Laboratory is 790,000 million euros. It is necessary to adopt a decision on the manner of securing funds during 2019.

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development.

Future steps and time frame: Adoption of the decision on launching the project and securing required funds.

4) Reconstruction and Adaption of the Building of Peoples' University (Radnički univerzitet) in Novi Sad

Description of the activity:

In Novi Sad, the idea is to establish a Business, Research and Innovation Center of Novi Sad. Given that it was assessed that Novi Sad is sufficiently large and strong IT and new technology center, the Council will consider the possibility to establish such Center, and the suggested location of Peoples' University in Vojvodjanskih Brigada Street will be considered, which is currently owned by the City of Novi Sad. The Center would be established in close cooperation with the local IT companies. It would have a part dealing with development of start-up companies; it would gather developmental branches of IT companies in Novi Sad, and it would deal with connecting and educating local innovation ecosystem.

Estimated budget: Around 4 million euros.

Responsible body: City Administration of Novi Sad

Realization time frame: Detailed deliberation of the concept of the Center, budget estimate and agreement on cooperation with IT community in Novi Sad.

5) Raising Research Capacities in Information Technologies

Description of the activity:

Raising research capacities in information technologies is critical for development of new and innovative solutions in the domestic industry. Ministerial Council for Information Technology and Innovative Entrepreneurship will support development of special programs and tools (institutions?) for supporting projects that encourage cooperation between science and economy, and also international scientific cooperation in the field of information technology.

Estimated budget: If appropriate mechanism is defined and adopted, it will be necessary to find appropriate funding sources.

Responsible body in the Government of the Republic of Serbia: Prime Minister's Office, Ministry of Education, Science and Technological Development.

6) Establishing a National Center for Artificial Intelligence, Robotics and Education Technology

Description of the activity:

Growth of technological and organizational complexity of production and business systems requires structural approach to development of engineering skills, with application of information technology. Complex requirements of researching industrial innovation ecosystems in the field of robotics, smart factories and education technology have been recognized as inseparable units when resolving actual challenges posed by the society, from social-economic to technological.

National Center for Artificial Intelligence in Industry, Robotics and Education Technology will represent an integral innovation center at the Faculty of Technical Sciences of the University of Novi Sad, and it would consist of the following labs: 1) Robotics Lab , 2) Smart Factory Lab and 3) Education Technology Lab.

Current researches in the field of **robotics** have been primarily aimed at collaborative robots and development of intelligent robotics subsystems and platforms. Significant need of the industry regarding cooperation with the University in application of artificial intelligence in the development of **smart factories** resulted in the series of projects dealing with predictive analytics and finding hidden relations in the production process data. Integration of production systems by application of Internet of Things and other concepts represents a path towards a more complex workplace, with higher degree of added value. In the past ten years, **Education Technology Lab** has been actively dealing with development and application of new technologies for distant learning, in terms of research work and development of practical tools, that ensure richer learning environment (for instance, hybrid learning, digital platforms and instruction techniques, expanded virtual and combined reality, artificial intelligence, development of digital competences). Team of professors, assistant professors and young researchers from the Faculty of Technical Science are currently working on realization of numerous industrial projects in the given field, and are winners of numerous awards at international competitions (EUROBOT).

Project of **Establishing National Center for Artificial Intelligence, Robotics and Education Technology** would be realized at the **Faculty of Technical Sciences** of the University of Novi Sad by means of reorganization of existing labs (Robotics Lab, Integration System Lab and Artificial Intelligence and Distance Learning Lab), and as a result it would have special organizational unit of the Faculty which would come into existence by expanding existing content (spatial, programming, experimental).

Estimated budget: Estimated budget for establishment of the Center is 1.7 million euros. It is necessary to adopt a decision on the manner of securing funds during 2019.

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development, in cooperation with the Ministry of Education, Science and Technological Development, Provincial Secretariat for Higher Education and Science-Research Activities, University of Novi Sad and other relevant institutions.

Realization time frame: During 2019, letters of intent would be put into operation, along with the memoranda of understanding with the Companies, VICON, FANUC, ABB Robotic, FESTO,

MITSUBISHI, SIEMENS, NET DRAGON, KODABRA, EDMODO, Fraunhofer Gesselschaft and others. The Faculty has already established cooperation with all these companies.

Also, during 2019, a network of institutions should be established in the Republic of Serbia, within which parts of researches should be distributed depending on the expertise of the institution. In addition to the Faculty of Technical Sciences, the Network would comprise Faculty of Mathematics and Natural Sciences in Novi Sad, and Faculty of Electrical Engineering and Teacher Education Faculty in Belgrade.

7) Procurement of Equipment for VR Production at the Faculty of Dramatic Arts of the University of Belgrade

Description of the activity:

Funds are intended for purchasing technique for recording and reproducing documentary and low-budget VR films, as well as for developing internal digital capacities necessary for high-speed sharing of video material, both within local network and via specially designed website. Virtual reality is often called "empathy machine". All larger media houses in the world, from New York Times to Guardian, have special departments dealing with development of storytelling in virtual reality, since effects made on the public with such type of storytelling are substantial. By purchasing equipment, necessary for recording and reproducing documentary and low-budget VR films, this world would be opened not only to students of Faculty of Dramatic Arts (FDA), but also to journalists working primarily in state-owned media houses, and to journalist working in privately-owned media centers at market prices. They would come to training, which would assist them to master this new technology in the efficient manner. Also, we would be able to offer educational programs to both, foreign journalists and documentary filmmakers.

Particularly important aspect would be creation of content for various international services that are similar to YouTube. In addition to the fact that those are paid services, their effects are substantial, both due to the mentioned effect of the virtual reality, and due to poor competition at the moment. The fact that it is possible to make a successful VR experience in the Balkans is reflected in the results of one of the best-selling VR experiences, produced in Croatia.

What would make FDA different from large number of currently active studios and individuals is the fact that FDA would make documentary and low-budget motion picture movies in VR technology, and not games or animated movies. Although there are offers in this field, FDA has the most extensive experience since large film studios still do not have interest to step into VR market, due to high filming costs. FDA, as a film school cooperating with private companies that are interested in mastering new technologies, may keep such costs at the minimum, which makes them highly competitive.

Estimated budget: Estimated budget is 130,000 euros. It is necessary to adopt a decision on the manner of securing funds during 2019.

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development, in cooperation with the Ministry of Culture and Information.

Realization time frame: Adoption of the decision on launching the project and securing required funds.

8) Procurement of Equipment for Digital Archiving System at the Faculty of Dramatic Arts of the University of Belgrade

Description of the activity:

Funds are intended for purchasing technique for restoration, remastering and digital archiving of existing materials, as well as for developing internal digital capacities, necessary for high-speed sharing of video materials, both within local network and via specially designed website. Currently, archiving systems are implemented by Film News (Filmske novosti), Serbian Radio Television and Yugoslav Film Archive Museum, but their capacities cannot meet their needs. Through theoretical and practical knowledge acquired at FDA, students are also trained in practical work with the mentioned archive systems, which significantly increases overall capacities for archiving, restoration and remastering of materials that represent a cultural heritage of the Republic of Serbia.

With the knowledge and professional skills of the FDA teaching staff, it is possible not only to digitally archive old film and video materials, but also to do the refined restoration and remastering of the complete material - such process includes returning original quality of the material, removing all distortions resulted from the storage conditions where the material is stored, physical properties of the media itself (filmstrip changes its physical properties over time, resulting in distortions) and, finally, storage of the material in the best resolution according to the current EBU standards (European Broadcasting Union).

As an added value of this system, there is a possibility to offer archiving services, and/or digitalization, restoration processing and remastering of archived material of other institutions and private organizations in Serbia and broader in the region.

Estimated budget: Estimated budget is 300,000 euros. It is necessary to adopt a decision on the manner of securing funds during 2019.

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development, in cooperation with the Ministry of Culture and Information.

Realization time frame: Adoption of the decision on launching the project and securing required funds.

9) Procurement of Equipment for Virtual Studio at the Faculty of Dramatic Arts of the University of Belgrade

Description of the activity:

Funds are intended for purchasing technique for operation of the virtual film studio, as well as for developing internal digital capacities, necessary for high-speed sharing of video materials, both within local network and via specially designed website. Foreign film productions have spent 58.5 million euros in Serbia since April 2016, and large part of the money has been earned by hiring low skilled and medium skilled workers. Investments are required in order to be able to offer more advanced solutions in the next stage in Serbia that generate much higher profit. The amount of profit that may be generated is evident in the example of neighboring Hungary, where 299 foreign production films were made in 2016, generating 387 million euros in profit. In 2016, Serbia recognized that potential and supported the development of the film industry through introduction of rebate for film productions. Hungary's advantage is definitely architecture of Budapest, but in future the real environment, and/or film location will become totally irrelevant: complete scenography will be virtual, thus location of the virtual studio would not be important.

Serbia has the chance to expand its business offer in the field of film industry. Virtual studio includes large number of cameras filming at the same time, from all four sides, as well as appropriate software and hardware for filming and picture processing. Such studio enables filming of moving objects and people (so-called *mocap*, and/or *motion-capture*), which is a technology that has been used in practice in the entertainment industry, and also in the military industry, robotics, medicine and sport. Progress in this field leads to the situation where the actors' movements in real time will be combined with scenography, which will significantly facilitate the work of the complete creative team, primarily the work of the director of photography and film director, but also of the producer, because it will drastically decrease filming costs, since the complete filming will be conducted in the virtual studio.

Practical implementation has already begun: new Mercedes AMG campaign, broadcasted for the first time during prestigious golf tournament of the US Masters 2018, is one of the examples of how this technology is used. For now, the technology is very expensive, which means that were are several years away from its broader usage, primarily due to the fact that real-time picture processing is very demanding process in terms of hardware, and for such studio it is necessary to process and harmonize pictures filmed by several dozens of cameras at the same time, and then, also to harmonize them in real-time with three-dimensional virtual scenography.

The Project includes establishment of a Virtual Studio at the Faculty of Dramatic Arts, which would offer to foreign film companies pre-visualization of their projects at significantly lower prices than currently offered in other countries: instead of story-boards and animations, which were used until recently, the opportunity to have equal quality of pre-visualization of future films could be used by not only film production companies ranging from 5-10 million dollars that use services of Serbian companies, but also by film production companies with ten times more money that use the services of American companies.

Example for this is an American studio who wishes to shoot a trailer with B category actor in the leading role. Screenplay has been completed, and the director has made a storyboard. Producer may only send such storyboard to Serbia, and within several week scenographers will make 3D objects that make up scenography, while local actors, local director of photography and local film director would

make entire movie in virtual studio according to the storyboard. Based on such pre-visualization, the producer and director would wish to change some of the shooting angles. That would not be a problem, since everything was filmed in a virtual studio from all four sides, and it would be possible to choose a completely different camera angles with just a click, without new filming session. Such project would mean that our experts are hired in both, during filming of the movie and before actual filming. Experience gained during this process is extremely important for both, education and further development of the profession, while benefits for local production and Serbia are more than evident.

Hence, the main goal of the Project is, through close cooperation between successful companies and leading higher education institutions, to adopt new technologies for pre-production, which would open up numerous business opportunities for both, companies leaders in the domestic market and for the series of start-up companies in the creative industry. Special benefit would be brought to generations of already established experts in this field, and to those who will become experts, for during project realization educational capacities would be developed in parallel.

Also, special direction of potential development is aimed at robotics, along with experimental and subsequently commercial application of the above-mentioned. Serbia has extraordinary tradition in the field of designing anthropomorphological robots, and currently in Serbia work is conducted on developing software able to read emotions from the human face, and also to harmonize such emotions with robot's movement. In such complex endeavor, they need actors' assistance, which should ideally be filmed - in a virtual studio. **Possibilities are endless and, contrary to many other fields where we cannot compete because our experts have left the country, in this field we have experts that can ensure bringing foreigners to Serbia, to the benefit of the entire community.**

Estimated budget: Estimated budget is 500,000 euros. It is necessary to adopt a decision on the manner of securing funds during 2019.

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development, in cooperation with the Ministry of Culture and Information.

Realization time frame: Adoption of the decision on launching the project and securing required funds.

10) Survey of Technological Start-up Ecosystem in the Republic of Serbia

Description of the activity:

Some of the main instruments of digital economy are start-ups which create new technologies and new job opportunities, thus contributing to employment and creation of added value in the country. In order to create incentive environment, where new start-ups would develop and emerge, as well as innovative and globally oriented businesses, investments should be made in various support systems, but above all **analysis must be conducted regarding the current state of play of the ecosystem. Goal of the survey is to collect measurable data and develop action plan for strengthening technological start-up ecosystem in Serbia.**

Objectives of the survey are the following:

- Identifying weaknesses in the existing ecosystem,
- Assessment of comparable parameters of technological start-up ecosystem relative to other ecosystems of similar size,
- Harmonization of public policies with the needs of technological start-up ecosystem, and
- Identifying skills and fields where further development is needed in the education system, as well as manner which would lead to creation of entrepreneurship thinking with children and the young.

Estimated budget: Estimated budget is **6 million dinars.**

Authority(ies) competent for realization: Office of the Minister without Portfolio responsible for innovation and technological development, in cooperation with "Digital Serbia" Initiative.

Realization time frame:

February 2018. - Public bid notice for organization which will conduct a survey.

June 2018. - Completion of the first phase of survey (defining high-priority fields for further development of technological start-up ecosystem, local weaknesses identified).

December 2018. - Completion of the second phase of survey (action plan developed for strengthening technological start-up ecosystem).

11) Construction of Broadband Communication Infrastructure in Rural Areas in the Republic of Serbia

Description of the activity:

Construction of FTTH access networks in municipalities or parts of municipalities with no clear economic interest, thus with no plan of operators regarding construction of those networks

Project realization would include piloting of incentives model for construction of networks of this type that, with potential modifications, would later be implemented in order to cover 600-800 thousand households in the areas with no clear economic interest on the part of operators to build FTTH access networks.

Proposed Project would include 3-7 different municipalities (covering entire municipalities or part of them) and around 30 thousand households, while investment value would be around 20 million euros VAT excluded. Government of the Republic of Serbia would construct network in areas where operators would not do it because there is no economic interest, and then, in a transparent way, the Government would lease such network by granting long-term management and usage rights to some of the operators.

Estimated budget: 20,000,000 euros (funds have not been secured)

Authority(ies) competent for realization: Ministry of Trade, Tourism and Telecommunications

Realization time frame:

1. Required funds should be secured.
2. Procedure of concluding multi-year contract for construction of networks (start + 3 months).
3. Contract realization for construction of networks (start + 18 months).
4. Public bid process implementation for selection of operator who would manage the constructed infrastructure (start + 20 months).