Organizational and business model of ICT cluster and scholarship fund at BSU

Establishment of a new ICT capacity building program in Belarus

Submitted To:
World Bank Project Team
Sandra Sargent
ssargent@worldbank.org

Juan Navas-Sabater
jnavassabater@worldbank.org

Submitted By:
JSC “Civitta BY”
Daniel Krutzinna, Team Lead
+375 44 7 412 412
daniel@civitta.com

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## Abbreviations

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>Antimonopoly Law</td>
<td>Law of the Republic of Belarus No. 94-3 dated 12 December 2013 “On countering monopolistic activities and development of business competition”</td>
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<tr>
<td>Belarus</td>
<td>The Republic of Belarus</td>
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<tr>
<td>BNTU</td>
<td>Belarusian National Technical University</td>
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<tr>
<td>BSEU</td>
<td>Belarusian State Economic University</td>
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<tr>
<td>BSU</td>
<td>Belarusian State University</td>
</tr>
<tr>
<td>BSUIR</td>
<td>Belarusian State University of Informatics and Radioelectronics</td>
</tr>
<tr>
<td>BYN</td>
<td>Belarusian rubles</td>
</tr>
<tr>
<td>Decree No. 5</td>
<td>Decree of the President of the Republic of Belarus No. 5 dated 31 August 2015 “On foreign grant aid.”</td>
</tr>
<tr>
<td>Decree No. 300</td>
<td>Decree of the President of the Republic of Belarus No. 300 dated 1 July 2005 “On granting and using gratis (sponsor) aid.”</td>
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<tr>
<td>EBRD</td>
<td>European Bank for Development and Reconstruction</td>
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<tr>
<td>Education Code</td>
<td>Code on Education of the Republic of Belarus</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>GDP</td>
<td>Gross domestic product</td>
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<td>HEI</td>
<td>High Educational Institution</td>
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<td>HTP</td>
<td>High Technology Park</td>
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<tr>
<td>IAS</td>
<td>Information Analytical Systems</td>
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<tr>
<td>ICT</td>
<td>Information and communication technology</td>
</tr>
<tr>
<td>IT</td>
<td>Information technology</td>
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<tr>
<td>IT cluster</td>
<td>A platform to support projects in informatization and electronic communication development of Belarusian state and society intended for aggregation and synergy of stakeholders, first of all, of the IT community</td>
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<tr>
<td>KPI</td>
<td>Key Performance Indicators</td>
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<tr>
<td>mn</td>
<td>Million</td>
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<tr>
<td>NTPS</td>
<td>National Paperless Trade System</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>Resolution No. 779</td>
<td>Resolution of the Council of Ministers of the Republic of Belarus No. 779 dated 13 July 2005 “On approval of grant (sponsor) aid model agreement”</td>
</tr>
<tr>
<td>REVERA</td>
<td>Revera Consulting Group, LLC</td>
</tr>
<tr>
<td>The Client</td>
<td>World Bank</td>
</tr>
<tr>
<td>The Consultant</td>
<td>Civitta BY</td>
</tr>
<tr>
<td>USD</td>
<td>United States Dollar</td>
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<tr>
<td>WB</td>
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Executive Summary

Analysis of different aspects of BSU ICT Cluster development

The third part of the report provides an overview of the key features of estimated BSU ICT cluster: its development plan, organizational structure, and list of potential participants, as well as legal justification within the legislation of the Republic of Belarus. Several conclusions are provided below:

- Based on the study of international organizations, we identified three types of ICT clusters: 1) export-oriented clusters; 2) clusters focused on startups’ support; 3) specialized clusters ("project teams"). In addition to different goals, these clusters are distinguished by the roles of their participants from various spheres. **A preferable cluster model for the BSU is the specialized cluster - project team:**
  - establishment of a cluster that stimulates the overall development of exports is unlikely, because of successful HTP performance;
  - the development of a cluster of a startup incubator is hindered by obsolete legislation and is not realizable in the current legal system;
  - cluster as a project team will use the strengths of BSU and Belarusian IT companies, as well as promote the education sector and integrated systems development.

- **Several organizations in Belarus unite IT companies and have some features similar to clusters - High Technology Park, IMAGURU, and the Infopark Association.** The HTP is aimed at developing the export of IT services; the IMAGURU Business club focuses on a venture ecosystem in the Republic of Belarus, and the Infopark Association implements comprehensive projects through the cooperation of local companies. An active support of the state authorities allowed the HTP to achieve the greatest success among other organizations.

- **Potential areas of cluster specialization are e-health, trade, government and financial technologies.** According to the practice of highly developed countries, the use of information technologies (IT) in healthcare gives a significant increase in the efficiency of medical personnel, the quality of diagnosis and treatment in general. IT solutions in the field of trade automation greatly simplify planning and inventory management. At the same time, the transformation of processes and services into digital format significantly improves the quality of public services and makes them more accessible to citizens and businesses.

- **The primary objectives of the cluster are to increase the overall level of digitalization of the country, to develop the internal IT market and to improve the quality of IT education.** The cluster is aimed at solving such problems as the weak competition of local IT companies with international corporations in implementing projects of a national scale, low domestic demand for IT services and products, and the imperfection of Belarusian IT education. The solution of these problems is possible due to the use of advanced technologies in the implementation of projects of the state scale and involvement of all stakeholders in the decision-making, concentration on internal projects and closer communication between the educational and commercial sectors.

- **The Association is the most preferable organizational and legal form of an IT cluster.** Unlike a limited liability company, the maximum number of participants in the Association is not limited. There is no need to distribute shares to the participants at the establishment stage, the adoption of corporate decisions is much simpler and does not require the consent of all members of the Association. The primary goal is not to derive profits from its activities, but the consolidation of some interested organizations for the realization of common interests, coordination of actions and goals.

- **Financing of the IT cluster is based on the profit from the commercial direction through the creation of a limited liability company.** The main aim of the subsidiary LLC of Association will be the performance of entrepreneurial activities by developing software ordered by private entities and participating in public procurement procedures. Profits received from business, except the
necessary financing to maintain operating activities, LLC will transfer the Association by distributing the profit to its participants for the further use educational and research purposes.

- **For the financing of non-commercial activities (research, educational), the Association will create a non-profit organization in the form of a fund.** The Fund is recognized as a non-profit organization, which has no fixed membership, established by legal entities by voluntary property contributions, pursuing educational, scientific or other socially useful purposes specified in the charter of the fund. The main function of the fund will be the financing of educational and research programs, which are supposed to be carried out within the Association. The sources of the formation of the assets of the fund will be the property transferred to the fund by its Association, as well as receipts from activities carried out by the charter of the fund.

- **Taking into account the high cost of the master's program (due to the involvement of highly qualified teachers) one of the objectives of the fund will be financing the master's educational programs.** The cost of master's programs with a practicing teaching staff will be significantly higher than the average cost of postgraduate education. Therefore, taking into account the impact of cost on reducing the demand for a master's program, a preferable option is to finance a scholarship fund for students with further employment in a cluster company. From the legal point of view, these relations with undergraduates can be formalized by a contract on training a specialist on a fee basis between a scholarship fund, BSU, and a master student. An alternative to a training agreement is a loan agreement between a funding organization and a graduate student.
1. Overview of the types of foreign IT clusters. Rationale for the cluster model

1.1. The concept of a cluster

An industrial cluster is an agglomeration of companies, suppliers of goods and services, as well as related financial, educational, research and other institutions. Organizations in the cluster complement each other and are in relative geographical proximity, which allows creating an additional synergistic effect, which includes access to specialized human resources and suppliers, knowledge spill-overs, increased productivity and competition, etc. Moreover, the establishment of interconnections occurs not only within a separate cluster but also between different clusters, which, in turn, accelerates the development of the economy.

Cluster initiatives promote national competitiveness and include policy reforms, trade capacity building, a private-public dialogue, regional economic development, workforce development, etc. Sometimes they become a catalyst that provides broad public attention and support for economic reforms by working with media, universities and think tanks, technology foundations, industry leaders, government officials, etc. When designed carefully and implemented efficiently, cluster initiatives may be one of the most useful tools for private sector development.

Figure 1: General structure of the cluster

![Diagram showing the general structure of a cluster]

Source: Civitta team analysis.

Depending on the specialization, clusters can contribute to the foundation and development of technological innovations, as is seen in the IT clusters of Silicon Valley and Bangalore. They can also stimulate innovation in creativity and fashion, as, for example, in Paris and Mumbai. Clusters for venture projects commercialize and form a new business through start-ups. The expansion of one of the clusters often leads to the foundation of clusters in other areas. For example, the optics cluster in Arizona gave rise to clusters in the plastics, aerospace, environmental, information technology and biological sciences.

Industrial clusters often evolve spontaneously over decades. However, well-designed cluster initiatives can accelerate the process and provide a much-needed initial platform. The cluster initiative assumes a comprehensive assessment of markets, products, linkages, external factors and possible synergies in the cluster to identify regulatory and business constraints, tap new and wider market opportunities, and develop sound business strategies. The results may include improved operational efficiency, yielding more
and better jobs, higher exports, the sustaining market reforms and, above all, better coordination between the public and private sectors in eliminating productivity bottlenecks. Also, the benefits extend beyond the cluster through its linkages, external factors, and synergies.

The political and economic frameworks play a crucial role in the design and implementation of policies to promote industrial clusters. Since the levels of clusters can vary from local to national, governments at all levels should be involved. Central level coordination strategies include inter-ministerial committees that jointly conceptualize and develop recommendations for cluster policies. Governments need to play a significant role in the initial stages, such as guiding cluster mapping, and in the final stages, such as leading the dialogue between public and private sectors on political and institutional bottlenecks that impede the development of the industry. At intermediate stages, the government can take on such functions as the analysis of firm-level competitiveness and the segmentation of the market and products.

Various government entities can sponsor the cluster initiative on their own or in partnership with international agencies. When international donor agencies are involved, they can be a part of broader technical assistance programs that ideally span several years. Particularly important is the initial period (3-4 months), during which the research identifies the main linkages among clusters, as well as their contribution to employment, export growth and specialization in the overall economy. This initial exploratory period should also determine whether the cluster leaders are sufficiently motivated and interested since their support will be crucial for the development of the cluster.

In the Republic of Belarus, government entities are taking steps towards clustering the economy. To date, a government decree has been adopted that approves the concept of the foundation of innovation and industrial clusters, as well as the draft of the presidential decree "On Some Measures of Foundation and State Support of Innovation-Industrial Clusters."

The development of high-technologies associations is owed to the low share of state property in the industry. Private companies, focused on Western counterparts, tend to form cluster structures to enhance competitive advantages and reduce infrastructure costs. At the same time, in other sectors where the share of state property can be up to 70%, the economic management bodies are not interested in forming clusters.

**Figure 1: Examples of associations in Belarus**

<table>
<thead>
<tr>
<th>Examples of effective belarussian associations</th>
<th>Examples of ineffective belarussian associations</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="HTP" /></td>
<td><img src="image2" alt="HTP" /></td>
</tr>
<tr>
<td><img src="image3" alt="INFO PARK" /></td>
<td><img src="image4" alt="INFO PARK" /></td>
</tr>
<tr>
<td><img src="image5" alt="Походине &quot;БелОМО&quot;" /></td>
<td><img src="image6" alt="Походине &quot;БелОМО&quot;" /></td>
</tr>
<tr>
<td><img src="image7" alt="Белорусские обои" /></td>
<td><img src="image8" alt="Белорусские обои" /></td>
</tr>
<tr>
<td><img src="image9" alt="ИНТЕГРАЛ" /></td>
<td><img src="image10" alt="ИНТЕГРАЛ" /></td>
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</tbody>
</table>

*Source: Civitta team analysis.*

The greatest success in the Republic of Belarus in the foundation and development of associations has been achieved in the IT industry. Such associations as the High-Tech Park (HTP) and the Scientific and Technological Association "Infopark" (since 2005 and 2001 respectively) are drivers for the development of the industry. These associations are based on the following prerequisites:

- historical heritage of the USSR - Belarus as a center for the high-tech production;
- the high share of private property among companies;
- export orientation of the industry and limited internal market;
- overall development of IT technologies and telecommunications;
• the geographical position of Belarus and the mentality of IT professionals.

Despite the rapid development of IT in Belarus, the lion’s share of their products and services is exported and not used in the domestic market, which leads to a paradoxical situation when software products of foreign providers are more popular within Belarusian companies. At the same time, the Belarus’s IT industry with preferential terms in the tenders procurement process and sufficient competence for the implementation of projects, cannot offer competitive integrated solutions because of the lack of a common platform for aggregating their efforts. The creation of a cluster, the primary goal of which is to unite the capabilities of IT companies and enable them to create complex integrated systems, will significantly increase the competitiveness of the Belarusian IT sector in the international market.

1.2. Types of clusters

During the analysis of international cooperation of companies in the ICT sector, we identified three main types of clusters:

• cluster as a driver of export development;
• cluster as a business incubator;
• specialized cluster as a project team for the implementation of integrated projects in a particular sphere.

These types quite strongly overlap (due to the development of the cluster and the expansion of its functions). Differences lie in the goals of cluster foundation, as well as in the roles of participating companies. A detailed description of the cluster types is given in Table 1.
Table 1: Types of clusters and their characteristics

<table>
<thead>
<tr>
<th>Cluster type</th>
<th>Public sector</th>
<th>Private sector</th>
<th>Benefits of cluster membership</th>
<th>Examples of foreign clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export-oriented cluster</td>
<td></td>
<td></td>
<td></td>
<td>CLUJ IT Romania</td>
</tr>
<tr>
<td>Cluster as business incubator for venture projects</td>
<td></td>
<td></td>
<td></td>
<td>Itechs Transilvania Romania</td>
</tr>
<tr>
<td>Cluster as a team for implementing integrated projects</td>
<td></td>
<td></td>
<td></td>
<td>Software.Brussels Belgium</td>
</tr>
</tbody>
</table>

- **Wide represented in the cluster**
- **Presented in a cluster**
- **Not represented in the cluster**

**Source:** Civitta team analysis.
1.2.1 Cluster as a driver of export

As an export development driver, the cluster is a consolidation of the sector companies in the technology park (or another organization) to increase its production efficiency and reduce infrastructure costs.

The state is the main founder of such clusters, attracting the companies into the cluster through tax incentives and preferences. The export cluster is legally restricted to a particular territory, and the specialization of enterprises in the cluster is strictly regulated. The primary objective of such a cluster is to stimulate the ICT sector’s growth, export development and attraction of foreign companies.

Cluster (as an export development driver) has some benefits for its members:

- assistance in obtaining tax advantages and preferences;
- necessary production infrastructure;
- consulting support;
- help in attracting foreign investments.

At the same time, the main drawback of this type of clusters is the weak linkage between government agencies and the private sector, as well as between cluster members.

Educational institutions may be present in an export-oriented cluster, but their role is small and expresses in providing the participants of the cluster with a workforce.

The most successful export cluster in Belarus is the High Technology Park.

Belarus Hi-Tech Park (the HTP)

The HTP was founded in 2006 as an innovative IT cluster, the main purpose of which is to support the development of the software industry. The main advantage of the High Technology Park is the preferential tax regime, tax and investment incentives provided to residents.

Starting from 2012, the number the High Technology Park members increased 1.5 times (from 118 in 2012 to 164 in 2016), while the number of employees in the HTP for the same period doubled.

The large scale of the HTP is presented by the following facts:

- around 1 billion people in 193 countries use applications developed by the HTP residents;
- 5 HTP resident companies were included in the list of 100 best global outsourcing companies in accordance with "The Global Outsourcing 100";
- 91.5% of software produced in the HTP is exported.

Export clusters are widely spread abroad:

iTech Transylvania

ARIES Transilvania created in 2013 the cluster iTech Transilvania, which started its activities providing technical and soft-skills training for employees of member companies and creating a base of knowledge and trainers for the implementation of collaborative projects in the human resources field.

iTech Transilvania Cluster extended its activities, providing innovation support services, internalization, facilitating collaborative projects between its members, between its members and other companies or organizations in the country and abroad.

The 55 member companies of iTech Transilvania cluster by ARIES have together over 4,500 employees and a turnover over 130 million euros. iTech Transylvania follows Quadruple Helix model, and provide support for open innovation in the open innovation eco-system as integrated system, together with local and regional actors, public authorities, universities, research institutes and others.
1.2.2 Cluster as a business incubator

A business incubator is a tool for promoting the development of the economy, aimed at active support of enterprises at the initial stage. The main objective of the cluster as a business incubator is to stimulate the foundation of innovative companies and products and provide them with comprehensive support. Clusters of this type are characterized by a large number of educational courses and institutions, holding hackathons and olympiads, as well as the availability of venture funds and business angels. This type of cluster has the following features:

- encouraging the creation of innovative products;
- ensuring the inflow of qualified specialists;
- providing the greatest profit margin in the long term.

Clusters-business incubators have not been developed in Belarus due to imperfections in the regulatory framework for venture financing. Belarusian start-ups are safer to start in neighboring countries. It should be noted that throughout the world higher education institutions are actively involved in the development of business incubators, providing highly qualified graduates, teachers, facilities, and equipment, but this cooperation is not common in Belarus.

The closest example to this structure is the IMAGURU Business Club.

Examples of business incubator clusters in the world:

**Software.Brussels**

The cluster is an initiative of impulse.brussels (Formerly The Brussels Enterprise Agency) supported by the Brussels Minister of Economy, Export, Employment and Research. The objective is to facilitate and reinforce drastically the economic development and the competitiveness of the Brussels-Capital region.

The cluster provides a unique business-oriented platform where members can share knowledge and best practices. Software.Brussels gathers 200 high-growth potential software companies, private & government support organisations, experts, universities and research institutions all dedicated to the Brussels software industry.

Software.Brussels offers start-ups and cluster members the following services:

- Individual support programs (development of business plan and positioning strategy, evaluation of financial needs and access to financing, legal assistance, etc.);
- Assistance in the introduction of a new product or service to the foreign market through a network of international partners;
- Organization of seminars and master classes, hackathons, meetings with investors and experts, informal events;
- Organization of educational programs for the cluster’s staff and assistance in the recruitment process;

1.2.3 Specialized cluster as a project team for the implementation of integrated projects

Cluster as a project team is a group of companies united to perform complex and integrated projects that are difficult to implement by each of the companies separately. The foundation of cluster-project teams enables small businesses to compete with global corporations and leads to the following benefits:
• ensuring the implementation of integrated projects;
• increasing the overall competitiveness of the economy;
• developing new areas of knowledge.

Typically, first projects are designed for the domestic market, which serves as a demonstration platform for the subsequent export of solutions to foreign markets. In many countries, universities are the platform for the development of innovative technologies and provide clusters with research resources and equipment.

The closest example of such association in Belarus is the scientific and technological Association "Infopark."

The scientific and technological association «Infopark»

According to the Decree No. 234, Infopark was established in 2001 as an association of companies engaged in software development in the Republic of Belarus.

As of January 1, 2017, Infopark unites 57 companies with more than 11 thousand software engineers (12 thousand people, including administrative personnel). EPAM Systems and the International Business Alliance (IBA), which occupy leading positions in the global rankings of software developers, consultants and IT service providers, are the members of Infopark.

The main projects of the association (forums, conferences, etc.):

• IT Bank (cooperation of belarussian banks and software developers);
• IT Insurance (improving the efficiency of the insurance companies based on IT solutions);
• IT2TLT (the use of information technologies in the logistics industry);
• Prom IT (best practices in the implementation of integrated information systems and technologies in industrial enterprises);

Examples of foreign clusters-project teams:

Domotys

Domotys, the non-profit Spanish Association for the Internationalization and Innovation of the Home Automation companies, was founded in 2009. Domotys works through a cluster strategy, it means that it has a global view of the entire home automation value chain and it is aware of the involved agents of the sector. Therefore, Domotys includes among its associates, universities, technological centers going through big companies and specially a wide representation of SMEs.

Nowadays, Domotys is composed by 219 members has a continuous contact with its associates which is translated into real approach of the challenges that the companies need to face as well as the market opportunities to reach. In order to accomplish this purpose, Domotys provides design customized services according to the needs of the associated companies in order to add value and improve their competences and position them as leaders within the market out of the national borders.

Domotys focus its attention on the internationalization as the main area of Domotys efforts. In the addition to the commercial missions and the presence in international tradeshows Domotys developed an own network of international delegates worldwide which support the associated companies through their local knowledge of the market as well as their expertise in the sector and contacts in the country.
1.2.4 Section Summary

The foundation of a cluster on any of the existing models will increase the prestige of the BSU. However, each model has certain drawbacks (Table 2).

Table 2: Advantages and disadvantages of implementing the cluster model in Belarus

<table>
<thead>
<tr>
<th>Type of a cluster</th>
<th>Benefits of the model for BSU</th>
<th>Disadvantages of the model for BSU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster as a driver of export development</strong></td>
<td>• with state preferences the foundation of the cluster will be much easier;</td>
<td>• intense competition with the HTP;</td>
</tr>
<tr>
<td></td>
<td>• Increase in university’s prestige.</td>
<td>• the necessity for a radical change in legislation;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• relatively weak role of BSU.</td>
</tr>
<tr>
<td><strong>Cluster as a business incubator</strong></td>
<td>• development of innovations;</td>
<td>• the necessity for a radical change in legislation;</td>
</tr>
<tr>
<td></td>
<td>• creation of projects with high added value;</td>
<td>• lack of investment funds and organizations.</td>
</tr>
<tr>
<td></td>
<td>• limiting the «brain drain»;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• increase in university’s prestige.</td>
<td></td>
</tr>
<tr>
<td><strong>Specialized cluster as a project team for the implementation of integrated projects</strong></td>
<td>• the significant role of BSU;</td>
<td>• more complex model implementation regarding communications with potential cluster participants.</td>
</tr>
<tr>
<td></td>
<td>• bridging the educational gap through synergy with the real sector;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• development of new areas of knowledge;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• increase in university’s prestige.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

A preferable cluster model at BSU is a specialized cluster-project team for the following reasons:

- the possibility of cluster foundation without significant changes in legislation. Companies’ cooperation can be implemented through the existing regulations;
- role of BSU will be the most important, compared to other models;
- the university will be able to solve the typical problems of IT education in the country (for example, attract lecturers from the real sector and provide a base for practice);
- the university will be able to specialize in separate niches, potentially becoming an international player in these areas;
- the university will be able to manage the cluster development vector and attain objectives on a national scale.

At the same time, the BSU cluster will differ from the existing associations of IT companies due to focus on other targets.
Figure 2: Main features of cluster’s activity

Source: Civitta team analysis.
2. The cluster’s roadmap

2.1. Cluster’s objectives

The designed cluster is aimed at solving national, commercial (implementation of large-scale projects) and educational goals. Thus, the ICT cluster of BSU could be considered as an association that unites leading companies in the field of information technology, software and application development, business project outsourcing that develop joint ventures and implements innovative educational programs with the support of authorities and higher education institutions.

The commercial component (implementation of large-scale projects) will be the basis for designing the cluster and attracting new participants.

The primary national objective is to increase the overall digitalization level of the country.

Projects of a national scale are now being implemented mainly by the forces of the major international organizations. These organizations usually use solutions already tested in other markets. The problem is that these solutions are not always up-to-date and correspond to the capabilities of the current level of technology development.

Another consequence of this approach is the lack of opportunities for domestic companies to develop and accumulate experience that can be exported to other countries.

The cluster is appealed for solving this problem with new advanced solutions for the implementation of projects of a national scale and involvement all stakeholders in the decision-making.

The main commercial objective is to develop the internal IT market.

Belarus is one of the leaders in Eastern Europe in the IT sector, is called the Silicon Valley of Eastern Europe. Furthermore, the IT industry is one the few sectors, Belarus can rely on when searching for sources of potential growth of country’s GDP.

In the meantime, more than 70% of services produced are exported. In 2016, amounting to about 957 mn USD were exported. In 2012-2016, the export of IT products and services increased more than 2-fold.

It is a widely held view that the level of domestic demand for IT products and services is low, especially during the economic decline in 2015-2016, particularly due to weak development of the local market. The majority of representatives of business and authorities lack knowledge in the field of ICT. Belarusian business entities do not use the potential benefits of ICT. As a result, they slip behind this indicator from neighboring countries, not to mention developed ones. The authorities' attempts to promote ICT in the government are not sufficient enough.

The cluster is appealed for solving this problem by focusing on internal projects.

The main educational objective is to improve the quality of IT education.

Another problem that the cluster can potentially solve is improving the quality of IT education, bridging the gap between the skills IT graduates and the requirements of the real sector. The leading causes are:

- poor qualification of teachers who do not have experience in real IT projects;
- low wages of teachers that do not allow to attract specialists from the real sector;
- insufficient collaboration between universities and the IT sector.

The cluster is appealed for solving this problem with a closer connection between the educational and commercial sectors.

Hence, the cluster, integrating education and the real sector, has a significant synergy potential and high competitiveness, primarily, with the design of joint projects with the public sector.
This interaction enables getting access to some conditions and resources, such as:

- **Human resources.** Access to highly qualified graduates and well-experienced employees is considered an important factor for innovation and companies’ competitiveness.

- **Research and knowledge.** The close collaboration between cluster companies and specialized SRIs is a key driver in the development of innovative activities and increasing the competitiveness of enterprises on domestic and foreign markets. Also, SSRIs as cluster participants potentially have greater competencies than HEIs in particular spheres.

- **To ease government regulations.** The public sector can play a crucial role in supporting the creation and development of clusters, for instance, by facilitating public-private partnerships and providing funding to cluster organizations. The public sector can also stimulate the development of innovative products and services through the procurement of cluster products.

- **Funding.** Access to finance is a serious problem in the field of ICT due to significant investment needs, and in the financial crisis, this issue becomes even more crucial. Moreover, Belarusian companies have never been inclined to invest in R&D. Therefore, the creation of a cluster will ensure stable access to financial resources, solving this problem to a certain extent.

- **Business environment.** It is assumed that entrepreneurship will play a significant role in the development of the cluster. As an example, it should be noted that one of the key factors for the success of Silicon Valley is the specific institutes that support the startups’ movement in the cluster. Such institutions often form a so-called ecosystem or incubator. Therefore, when developing measures to support clusters, it is important to take into account support for the development of entrepreneurship and entrepreneurial culture among students, researchers, employees and company executives, as well as support for start-ups.
2.2. The competitive advantages of the cluster. Value proposition for the cluster’s participants

2.2.1 The cluster’s participants

According to the best practice, the most successful ICT-clusters include participants from three main sectors:

- private;
- national;
- educational.

In addition to the above three areas, we also see the possibility of attracting to the cluster service and support companies (Business Environment Institutions), which could take responsibility for support developing solutions in terms of business logic, drawing up business plans and investment attraction plans, cooperation with international organizations.

In general terms, the potential participants can be represented as the following scheme:

*Figure 3: The cluster’s potential participants*

There is some evidence to suggest that each of the parties can make a positive contribution to the development of the cluster and to gain additional advantages and resources for themselves as a result of working partnership. However, there must be certain entry criteria. For example, among private sector companies, it is worth emphasizing those enterprises that have experience in implementing similar projects, and in the education sector, it is necessary to involve only those institutions that have high competencies in the field of ICT.
2.2.2 Value proposition for all the participants

**Private companies**

A consortium of private businesses within the cluster will allow the cluster members to apply for participation in the implementation of major projects, i.e., competing with major players to win tenders, including projects of a national scale.

Furthermore, due to the synergy with other companies, it will be possible to reduce transaction costs: advertising and R&D costs, licensing fees, payment of outside lawyers and auditors within the cluster.

For a long time, companies will be able to fill vacant positions as the specializations of the subsequent admissions can be changed under the influence of the participants of the cluster opinion. Therefore, the companies can directly participate in the preparation of highly qualified specialists, who, in their view, are the most in demand.

Private companies will gain the opportunity to improve the professional level and competencies of employees through the exchange of experience and skills between the merging companies.

**Government**

National projects will be carried out using modern technologies and solutions of small cluster companies, and not by replicating successful long-standing experience by large corporations that usually win tenders.

The Belarus’s ICT-market will be developed as domestic companies will gain experience and acquire new skills, carrying out major projects.

There will be new export opportunities due to the possible replication of the accumulated experience within the framework of Belarus. Examples of such a broadcast experience have already existed in Dushanbe: in July 2017, validators for public transport from the Belarusian company IBA-Group began to be testing.

**University**

The University will be able to get closer to the real sector, and therefore better understand its requirements, to fill the gap in the competencies of graduates and high-demand specialists.

Furthermore, an efficient practice base will be organized by large projects that require the latest software and technology solutions, which will promote the use of the newest educational methods and approaches.

It goes without saying that those mentioned above will help to improve the overall level of educational services and to receive additional income in the form of rent payments and wages to teachers of the university.

2.2.3 The cluster’s structure and participants’ roles

The relations within the cluster could be organized in the following structure.

**Private companies:**
- participate in the implementation of joint projects within the cluster;
- establish a special fund, by which means the planned master program will be financed;
- set a practice base for undergraduates;
- get the possibility to hire highly qualified graduates.

**University:**
- administers the master program;
- hires teachers, including specialists from private companies;
- participates in the implementation of joint projects within the cluster.

**Public sector:**
- get highly-qualified specialists-graduates;
- participates in the implementation of joint ventures within the cluster.

---

**Figure 4: The structure of relations within the cluster**

Source: Civitta team analysis.

2.2.4 The cluster’s structure and participants’ roles

In the process of creating a cluster, it is important to assess its weaknesses and strengths, to consider opportunities for growth and development, as well as all possible threats.
Figure 5: SWOT analysis of the cluster

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Synergy of private companies</td>
<td>• Uncertainty in regulating relations in a cluster</td>
</tr>
<tr>
<td>• Professors with experience in real sector</td>
<td>• The difficulties of financing a master program (scholarship fund raising)</td>
</tr>
<tr>
<td>• Effective practice of students</td>
<td></td>
</tr>
<tr>
<td>• Improving the quality of education</td>
<td></td>
</tr>
<tr>
<td>• Highly-qualified graduates</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The possibility of making projects of national scale</td>
<td>• Problems with products implementation (might not be in demand)</td>
</tr>
<tr>
<td>• Accumulation of competencies and export of solutions</td>
<td>• Inactivity of private companies (reluctance to join a cluster, relentless focus on their sphere of activity)</td>
</tr>
<tr>
<td></td>
<td>• Lack of state support</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

As part of the cluster analysis, main weaknesses of the cluster and its threats were identified. Also, we considered the scenario of their implementation and substantiated how they can be leveled (Table 3).

Table 3: Consequences and measures to overcome the weaknesses of the cluster and its threats

<table>
<thead>
<tr>
<th>Factor</th>
<th>Consequences</th>
<th>Measures to overcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weakness</td>
<td>Insufficient interest of private companies to join a cluster</td>
<td>• impossibility to implement large-scale projects due to a small number of businesses participating in the cluster;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• setting a scholarship fund to the incomplete extent.</td>
</tr>
<tr>
<td></td>
<td>Insufficient quality of the curriculum for the implementation of projects</td>
<td>• the absence of demand for specialists;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• lack of funding for the curriculum;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor</td>
<td>Consequences</td>
<td>Measures to overcome</td>
</tr>
<tr>
<td>--------</td>
<td>--------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>HEI use funds for purposes other than were intended by the cluster</td>
<td>• incomplete admission.</td>
<td>• direct funding to an independent legal body; • clear purposes of financing and budgeting.</td>
</tr>
<tr>
<td>There are no academics in BSU, who have what it takes to teach with high-quality program</td>
<td>• lack of funding for teaching staff compensation.</td>
<td>• involvement of teachers from outside the cluster using competitive compensation; • lobby for a change of teaching staff limitations in the law.</td>
</tr>
<tr>
<td>Complexity in involvement of talented students</td>
<td>• small students appeal, incomplete admission.</td>
<td>• admission on a competitive basis with a grant system; • conducting a large-scale PR-campaign to promote the master program; • selection and attraction of talented students, starting from the 2nd and the 3rd courses.</td>
</tr>
<tr>
<td>Unwillingness of the government to offer the cluster projects for implementation</td>
<td>• less-skilled graduates; • low demand for graduates from the real sector; • fall in the master program prestige and, consequently, the cluster; • inviability of students involved to real projects during practice.</td>
<td>• involvement of government representatives in the cluster; • BSU could lobby the interests of the cluster (especially, at the initial stage).</td>
</tr>
<tr>
<td>Lack of legislative basis for regulating relations in the cluster</td>
<td>• the risk of the cluster to be undeveloped.</td>
<td>• at the design stage of the cluster, the optimal organizational-legal form of the cluster will be developed considering the current legislation; • the principles of management and the areas of responsibility of the participants will be defined;</td>
</tr>
<tr>
<td>Legislative difficulties in fundraising of the master program</td>
<td>• the blurring of responsibility areas of the cluster participants; • conflicts due to difficulties in the distribution of money; • «fallout» of critical functions for cluster success.</td>
<td>• demotivation of private companies to fund the master program; • risk of incomplete admission due to low demand for education at the students’ expense.</td>
</tr>
<tr>
<td>Legislative limitations of the system of education</td>
<td>• failure to develop a high-quality and relevant master program.</td>
<td>• developing a transparent scheme for supporting the master program.</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.
2.3. Review of the potential participants and spheres of the cluster

Taking into consideration the international experience of digital transformation and the economic situation in Belarus, we believe that the digitalization of healthcare systems, trade, government and financial technologies could have the greatest effect on the economic growth and prosperity of Belarus.

2.3.1. E-health

According to the practice of highly developed countries, the use of information technologies in the health sector gives a significant positive effect on a number of such indicators as the effectiveness of medical personnel, the quality of diagnostics and treatment in general, the unification of medical services, the efficiency of management decisions, and availability of medical care.

According to the experts, digitalization of the Belarusian healthcare system may affect a broad range of aspects:

A. Automation of operational processes

Effect: significantly increases the effectiveness of medical personnel.

Belarus: a unified Internet registry system Talon.by has been developed. It is already available for about 50% of the population of Belarus. Trial operation of the Electronic Recipe system is carried out by city polyclinics in Minsk and all pharmacies of the state pharmacy chain "BELFARMACIA" in Minsk.

International practices: 90% of prescriptions in Moscow are issued electronically, which significantly shortens the waiting time at the polyclinics. Equipping the ambulance teams with tablets within the Uniform Medical Information Analytical System (UMIACS) allowed medical workers to access the information about people's allergies and chronic diseases in Electronic cards even before coming to patients.

B. Implementing electronic data collection of patients' clinical results

Effect: allows to significantly improving the quality of treatment and continuity of medical care, and substantially reducing the chronic patients' stay in the hospital.

Belarus: Such information analytical systems (IAS) at the national level as IAS "Healthcare", Belarusian National Cancer Registry, state register of persons who have suffered from radiation effects due to the Chernobyl nuclear disaster, state registers "Diabetes Mellitus" and "Tuberculosis", IAS on medical examination and rehabilitation of disabled people, as well as IAS "Young Specialist" were developed and implemented.

C. Implementing of automatic collection of operational indicators of the medical institutions

Effect: facilitates prompt and efficient managerial decisions.

Belarus: the information-analytical system of the state epidemiological register of patients with hematological diseases has been developed to monitor and analyze the quality of the medical assistance to the population. Also, a technology for the full-scale recording of injuries in the Republic of Belarus has been developed.

International practices: in the US, the Veterans Health Administration implemented the Care Coordination program, which involves about 44,000 people. By ensuring day to day monitoring of biometric indicators, doctors stratified the risks and improved the treatment. As a result, the number of hospitalizations reduced by 20%, and the annual cost of medical care decreased by eight times.

D. Subsequent application of statistical methods of data analysis

Effect: allows identifying the most efficient methods of diagnosis and treatment.

E. Automation of algorithms and protocols for treatment

Effect: allows establishing uniform standards for the medical services provision of different doctors and medical institutions, thereby improving their quality.
**Figure 6: Directions of e-Health development in Belarus**

<table>
<thead>
<tr>
<th>Aspect of the health system digitalization</th>
<th>Belarus 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Automation of operational processes</td>
<td></td>
</tr>
<tr>
<td>2 Automation of collection of patients’ results</td>
<td></td>
</tr>
<tr>
<td>3 Application of statistical methods and data analysis</td>
<td></td>
</tr>
<tr>
<td>4 Automation of algorithms and treatment protocols</td>
<td></td>
</tr>
<tr>
<td>5 Automatic collection of operational indicators of the medical institution</td>
<td></td>
</tr>
<tr>
<td>6 Mobile and online applications</td>
<td></td>
</tr>
<tr>
<td>7 Use of telemedicine tools</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Civitta team analysis.*

**F. Use of online and mobile applications**

*Effect:* simplifies the interaction between patients and medical institutions.

**G. Implementation of telemedicine tools**

*Effect:* allows expanding the geographical coverage of medical services to the remote areas, as well as increasing its efficiency and quality.

**Belarus:** the developed telemedicine system covers 11 district health organizations (DHO), nine - regional level and 10 - republican level (RHO). However, this technology actually works only within the transmission and remote consultations on the electrocardiograms (tele-ECG) and on the problem of thyroid gland tumors between the Republican Thyroid Gland Cancer Center (RTGCC) functioning on the basis of the Minsk Clinical Oncology Dispensary and the Republican Scientific and Practical Center for Radiation Medicine and Human Ecology (RSPCRM and HE) in Gomel.

International practices: “104” advice call-center in India increased the availability of medical care in rural areas fivefold.

The state program for the development of the information society for 2017-2022 includes the following directions of digitalization of the health care system:

- creation of automated information systems in healthcare organizations that will allow the proceeding to the maintenance of medical records (outpatient cards and medical histories) in electronic form;
- organization of a single information space for the health care of the Republic of Belarus by a corporate information exchange network;
- ensuring the transfer of medical records (extracts, epicrisis, analysis results, etc.), regulatory, organizational and administrative documents by a single corporate network in electronic form using an electronic digital signature;
- development and maintenance of the unified Republican advisory telemedicine network of healthcare organizations;
- development of the systems which monitor the health status of the population and epidemiological well-being;
- creation of the public electronic medical resources, including dedicated to a healthy lifestyle.

Nevertheless, the problem is that the necessary directions for the digitalization of the health care system are mentioned in this program without specifying responsible executors and detailing the sources of funding.

Until now, Belarus does not have a single body that would bear full responsibility for the implementing of medical IAS. In other words, no entity is responsible for the development of the e-health. This organization should be responsible for making decisions on the selection of the primary provider of medical AIS, and also distribute and control the funds allocated for this. Now there is only a kind of "subsidiary" responsibility (i.e., with the obligations "blurred" for all participants of the e-Health program).

The head institution responsible for the implementation and coordination of research and development work on the organization, management, economics and informatization of public health in Belarus is the Republican Scientific and Practical Center of Medical Technologies (RSPCMT). While the United Institute of Informatics Problems of the National Academy of Sciences of Belarus (the leading republican organization for fundamental and applied research in the field of information technology) often acts as the main developer of the medical software in Belarus. Also, Belana, BelHard Group, BelSoft, ZAO "MAPSOFT" and some others were also among the representatives of private business, who were recently involved in the creation of medical IAS.

The problem of e-Health implementing is complicated by insufficient qualification of medical personnel. It is necessary to pay attention to the training of staff to work with digital tools, to teach the patients, for example, with the help of visual online instructions for managing the personal cabinet, appointing to the doctor, reviewing the results of tests and prescriptions.

The Board of Executive Directors of the World Bank has approved granting a loan of 125 mn USD to the Republic of Belarus for the implementation of a new project "Health System Modernization." The project is aimed at improving certain aspects of the quality of medical care in the country, including the state program for the development of the digital economy and Information society. This project will include the following components:

- establishment of the e-Health system and implementation of the system for supporting clinical solutions based on ICT;
- increasing the level of clinical competencies of medical workers in the management of non-communicable diseases;
- improvement of the quality of neonatal care in the Republican Mother and Child Center;
- project management, monitoring, and evaluation.

Consequently, there were established some key performance indicators (Table 4).

<table>
<thead>
<tr>
<th>Table 4: Health System Modernization Project KPI’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Percentage of selected health facilities (PHC centers/ambulatories, polyclinics, hospitals, and diagnostic centers) that can electronically exchange patient’s records</td>
</tr>
<tr>
<td>Number of regions using e-prescription (cumulative)</td>
</tr>
<tr>
<td>Indicator</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Percentage increase in survival rate of newborns at the Intensive Neonatal Department of the RCMC</td>
</tr>
<tr>
<td>Percentage of PHC doctors in selected health facilities using clinical decision-making tools</td>
</tr>
<tr>
<td>Number of health care specialists trained in emergency medical care at BelMapo, including using simulation equipment (cumulative) (disaggregated by gender)</td>
</tr>
</tbody>
</table>


Thus, it is possible to point out the following directions of future projects for cluster companies in the field of e-health.

Table 5: Potential projects and its participants in e-Health

<table>
<thead>
<tr>
<th>Projects for implementation</th>
<th>Potential participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creation of a patient's personal cabinet with a broad range of personal electronic services</td>
<td>BelHard, МаноСофт</td>
</tr>
<tr>
<td>Creation of a full-scale system for handling electronic prescriptions using an electronic digital signature in the Republic of Belarus</td>
<td>belsoft</td>
</tr>
<tr>
<td>Design of AIS, which will allow moving to the maintenance of the medical records (patient’s cards and medical histories) in electronic form</td>
<td></td>
</tr>
<tr>
<td>Development of the Central Health Information System (CHIS), which will allow introducing electronic services for inter-departmental interaction (birth certificates, temporary disability certificates (Ministry of Labor and Social Protection))</td>
<td></td>
</tr>
<tr>
<td>Development and maintenance of the unified state advisory telemedicine network of health organizations</td>
<td></td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

2.3.2. E-trade

There are many opportunities to digitize and automate steps in trade operations, ranging from optimizing labor utilization to inventory management. Sophisticated data models and technological support for managers can help to optimize labor scheduling and improve capacity planning. For instance, a scheduling platform can embed complex data models that incorporate historical and external data, such as weather conditions. This enables managers to improve the accuracy of their predictions.

There are several spheres of digitalization in trade: logistics, e-commerce, and e-trade.

According to the World Economic Forum, there have been identified five themes that will be central to the digital transformation of the logistics industry over the next decade:
Information services: digitally enabled information services will put data at the heart of a logistics business through such initiatives as logistics control towers, and big data analytics will help in reducing operating costs while improving the efficiency of operations.

International experience: according to one McKinsey report, Hewlett-Packard and BMW’s use of RFID for managing global logistics networks reduced losses in transit by between 11–14% (Manyika et al. 2015, 37).

Logistic services: digitally enabled logistics services will help in trade growth through the creation of digitally enhanced cross-border platforms. It will also allow logistics companies to satisfy the growing need of customers for faster same-day deliveries, and promote the concept of city logistics, which will allow businesses to operate in “megacities.”

International experience: Chinese logistics companies are testing an Uber-like app. The app has allowed established players to reduce fleet costs by 30 percent in some cases and to avoid canceled orders.

Delivery capabilities: new delivery capabilities will enable logistics to harness technologies such as digital trucks and drones to find more efficient ways to deliver shipments, while 3D printing and crowdsourcing offer new ways to think of manufacturing and logistics processes.

International experience: in a report by ARK Invest, Tasha Keeney suggests that Prime Air could cost Amazon only 88 cents per delivery. If Amazon charged customers $1 per delivery, Keeney estimates, the company could earn a 50% return on its investment in drone infrastructure while offering same-day delivery that is significantly cheaper than current alternatives.

Shentong Express has already used robots in Hangzhou warehouses; they operate 24 hours a day and sort out up to 200 000 items per day. Thanks to this, the company managed to cut operating costs by half and increase its efficiency by 30%.

According to the forecasts of Boston Consulting Group, the participation of robots in logistics will grow from 2-3% to 25% by 2025. At the same time, staff costs will be reduced by an average of 20-30% (primarily in South Korea, China, Germany, Japan and the US).

Cheaper and faster delivery, in turn, will be a great driver for e-commerce. According to Savills, the share of online trade in the B2C segment (direct sales to consumers) will be 20-30% by 2025-2030.

Circular economy: the circular economy will foster a more sustainable product life cycle, helping to lessen the logistics industry’s environmental footprint by reducing carbon dioxide emissions, air pollution, and waste material.

International experience: Omni United has collaborated with Timberland to design its tires in such a way that allows it to be recycled into Timberland’s footwear outsoles.

Shared logistics capabilities: shared logistics capabilities are expected to increase asset utilization through shared transport capabilities shortly.

International experience: Nestlé and PepsiCo are two companies who share warehouse capabilities. Through this arrangement, they share the storage, packing operations and distribution of fresh and chilled food products destined for their retail customers in Belgium and Luxembourg. Shared warehouse agreements provide companies (customers of logistics companies) an opportunity to reduce their logistics costs by as much as 12 to 15%. (WEF, The digital transformation of logistics: Threat and opportunity).

Belarus has a very low overall score in Logistics Performance Indicators (LPI), which is a weighted average of six dimensions that include efficiency of the clearance process, quality of trade and transport, and competence and quality of logistics services.
According to Reaping Digital Dividends 2017, Belarus as emerging digital country (countries with weaker logistics infrastructure and payment systems (below a score of 4)) need to strengthen its logistics infrastructure and develop its payment systems. It should be done to provide easier and more secure online transactions so that firms can deliver their goods and receive payments for them.

The success in the field of e-commerce in the Republic of Belarus is evidenced by the fact that almost 100% of the commercial types of public procurement are pursued only within the e-trading platform. But at the same time, there is an extremely high services trade restrictions index (STRI) in Belarus according to Reaping Digital Dividends 2017 report (figure 7).

The STRI focuses on five major services sectors, namely financial services (banking and insurance), telecommunications, retail distribution, transportation and professional services (accounting and legal), with each sector further disaggregated into sub-sectors as applicable. The set of standardized measures can be divided into the following broad categories:

- legal form of entry and restrictions on foreign equity;
- licensing limits and transparency of licensing requirements;
- restrictions on operations;
- relevant aspects of the regulatory environment.

Moreover, it can be noted that for such a high rate of openness of the Belarusian economy, the high level of trade restrictions is not typical. So, in Figure 7 you can see that the STR index should be significantly reduced.
To neutralize such restrictions and simplify e-commerce procedures, the State Program introduced the development of the National E-commerce System. This system ensures the formation of legally significant electronic documents on the entire chain from the creation to the delivery of goods, works, and services to the final consumer, and based on the widely accepted communication protocols, safe transport mechanisms, and the use of a single electronic standard.

Simplifying trade procedures by shifting to a paperless platform and using computerization is the shortest way to develop and accelerate trade. The Government of the Republic of Belarus has already made some efforts to move to a paperless trade. One of the main achievements is the introduction of the electronic customs system by the State Customs Committee, which is completed and ready for operation and provision of services.

Thus, it is possible to point out the following directions of future projects for cluster companies in e-commerce, trade, and logistics:
### Table 6: Potential projects and its participants in e-trade and logistics

<table>
<thead>
<tr>
<th>Development of the National Electronic Commerce System</th>
<th>Potential participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development and implementation of the national intelligence information system of monitoring commodity and transport flows by modern technologies of automatic identification and electronic document management</td>
<td>[Image]</td>
</tr>
<tr>
<td>Designing of the new delivery tools</td>
<td>[Image]</td>
</tr>
<tr>
<td>Optimization of transport routes, traffic flows</td>
<td>[Image]</td>
</tr>
<tr>
<td>Designing of the information systems using RFID technologies</td>
<td>[Image]</td>
</tr>
<tr>
<td>Development of the National Electronic Commerce System</td>
<td>[Image]</td>
</tr>
</tbody>
</table>

*Source: Civitta team analysis.*

#### 2.3.3. E-government

The government plays a dual role in the digital economy. It creates an environment for innovation and simultaneously sets certain limits.

Belarus has the lowest rate of the government internet penetration in Europe and Central Asia (0.36), even lower than in Turkmenistan. Despite the fact that experts highly evaluate the telecommunications infrastructure and the development of human capital in Belarus, the quality of public services is poor, which attests to a significant potential for the implementing and development of e-government services.

Belarus made a significant contribution to the development of the integrated e-government ecosystem, simplifying the mandatory procedures for users and transparency of transactions through the implementing of an electronic declaring service.

According to the ID4D database, an electronic biometric identifier was introduced only in 15 countries of Europe and Central Asia so far. However, in 2017 Belarus plans to implement the electronic identifier within the State program of the digital economy and information society 2016-2020.

Thanks to the conversion of processes and services into a digital format and accompanying organizational changes, it is possible to significantly improve the quality of public services, reduce the costs of their providing and make them more accessible to citizens and businesses. For example, to do this, it is possible to implement a possibility to issue birth certificates, registering vehicles, issuing a passport or other identity card through electronic tools. Also, at the moment there is a need to expand the opportunities for electronic business registration. Now to start electronic business registration, it is necessary to obtain an electronic digital signature (EDS) key, but to get the EDS key - it is needed to personally contact the information and publishing center of the Ministry of Taxes and Duties of the Republic Belarus.
According to the state program, it is planned to expand the provision of access to open data, as well as to create an environment for the use of electronic services that stimulate their relevance.

Events planned:

- development of the "Electronic Visa" information system;
- creation of the traffic control center (TCC) within the project of modernization of the transit corridor;
- creation of a national open data portal by a single portal for electronic services;
- development of the State system of public keys management for validating the electronic digital signature of the Republic of Belarus;
- creation of the Belarusian integrated service-accounting system that will be able to solve the following tasks:
  - organize production and issuance of ID-cards and biometric passports to citizens of the Republic of Belarus;
  - ensure the establishment of remote, legal interaction with citizens by their ID-card identification;
  - create a service-accounting system that allows ID-card holders to be served electronically, given their benefits and other types of state support.

Thus, we may point out the following directions of future projects for cluster companies in the field of e-government:

<table>
<thead>
<tr>
<th>Projects for implementation</th>
<th>Potential participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creation of the traffic control center (TCC) within the project of modernization of the transit corridor</td>
<td></td>
</tr>
</tbody>
</table>
Projects for implementation | Potential participants
--- | ---
Development of the "Electronic Visa" information system | 
Design and implementation of a remote, legal interaction with citizens by their identification by ID-card | 
Organization of production and issuance of ID-cards and biometric passports of the Republic of Belarus | 

Source: Civitta team analysis.

2.3.4. Financial technologies

Now, we may see favorable conditions for the digital transformation of the financial industry in the country. The Resolution of the Board of the National Bank of the Republic of Belarus No. 108 of March 2, 2016, approved the Strategy for the Development of Digital Banking in the Republic of Belarus for 2016-2020. The priority aim of the Strategy is the expansion by 2021 of the interaction of banks, their clients, state bodies of state administration and commercial organizations.

The primary objectives of the development of digital banking for 2016 - 2020:

- **Creation and implementation of the interbank identification system.** The Interbank Identification System (IIS) in Belarus was implemented in October 2016.

- **Development of the common security standards in the field of electronic interaction, including the creation of a single center responding to the incidents of information security in the financial sphere.** At the moment, the National Center for Responding to Computer Incidents of the Republic of Belarus operates within the country. The primary goal of the center is to reduce the level of threats to information security of the national segment of the Internet. At the same time, there is an active development of a single center for responding to incidents related to the infringement of information security in the financial sphere is under development.

- **API implementation.** At the moment, the National Bank of the Republic of Belarus provides some APIs to obtain such data as the official exchange rate of the Belarusian ruble against foreign currencies, the refinancing rate of the National Bank of the Republic of Belarus, etc.

- **Development of the payment aggregators.** The main payment aggregators at the moment in Belarus are Unified accounting and information space, bePaid, Assist, Webpay, Webmoney, EasyPay, iPay. It is assumed that in Belarus, in particular, some online platforms will appear where it will be possible to bring together several cards of different banks.

- **Development of a system of non-cash payments for retail, contactless technologies and the market of electronic money.** At the moment, there are 12 746.6 th. Payment cards Republic of Belarus, which even exceeds the country’s population. There are also 4,380 ATMs and 3,381 information terminals, and the number of transactions using bank payment cards in the Republic
of Belarus exceeds 1 million. At the beginning of 2017, it was allowed to pay for goods and services with electronic money.

- **The digital transformation of the financial services market (including the development of blockchain technologies).** The National Bank of the Republic of Belarus has created an information network based on the blockchain technology, which can be used to solve a broad range of the current and prospective banking and nonbanking tasks.

- **Insurance.** One of the few steps towards its development in the Republic of Belarus is the implementing of the "online insurance" service by some companies, that, at the same time, applies only to certain types of insurance policies.

Thus, it is possible to conclude that these directions are particularly relevant to the implementation of IT projects and the interaction between the public sector and private companies, including communication within the planned cluster.

### Table 8: Potential projects and its participants in financial technologies

<table>
<thead>
<tr>
<th>Projects for implementation</th>
<th>Potential participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of blockchain to maintain a register of transactions with securities on the exchange and over-the-counter markets</td>
<td>SoftClub</td>
</tr>
<tr>
<td>Implementation of the API (Application Programming Interface)</td>
<td>COMPATIBL</td>
</tr>
<tr>
<td>Electronic ticket - service for payment in public transport with a mobile application</td>
<td>Белорусская валютно-фондовая биржа</td>
</tr>
</tbody>
</table>
3. Legal form of the IT cluster and model of its management bodies

3.1. Possible organizational and legal form of the IT cluster

We see two variants of cluster organization from the point of view of the organizational and juridical form: Association and LLC.

Figure 10: Organizational form of the IT cluster based on Association

Association
Includes BSU, interested IT companies (legal entities and IE). The number of members is unlimited

Commercial line

LLC (one/several)
Shareholders: Association (alone), or Members + Association, or Members of the Association only

Purposes:
- Participating in tenders;
- Software development on orders;
- Making a profit.

Educational line

SIMST of the BSU
Doesn’t require creation of a separate department, financing is provided through contractual relationship.

Research line

Institute /fund
Founder is Association or LLC of Association

Purposes:
- Informatization, research

Source: REVERA team analysis.

This variant features a non-commercial organization founded as an ‘association’, as the coordination center to represent the interests of IT cluster member organizations.

3.1.1. The basic structural element – the Association

Association features:

- The Association is a non-commercial organization, amalgamating the interests of its members and aiming at coordination of activities of Association members, representation and protection of common interests.
- Association is a separate legal entity (a non-commercial organization) and is subject to state registration in the manner prescribed by the laws of the Republic of Belarus.
- The Association is not entitled to carry out business activities. The Association may be involved in business activities only by means of creating commercial entities and/or participating in such entities, unless otherwise provided for by current laws.
- Association does not aim at the acquisition of profit and is not entitled to distribute any profits among its members. Current activity is funded, as a rule, using membership fees and other
uncompensated receipts from Association members or from activities of commercial entities created by the Association.

- According to cl. 1, art. 17 of the Antimonopoly Law, creation of an Association may require permit by the antimonopoly body of the Republic of Belarus if the book value of assets of one of such Association’s founders defined based on accounting statements as of the closing date preceding the date of the tentative creation of such Association should exceed one hundred thousand basic units, or the volume of proceeds of one of such Association’s founders from marketing its products according to the results of the reporting year preceding the year of such foundation should exceed two hundred thousand basic units, or if one of such entities is listed in the State Register of business entities dominating in product markets or in the State Register of natural monopoly entities.

Membership in Association:

- Commercial entities and/or individual entrepreneurs, or commercial and/or non-commercial entities may be members of the Association.

*Regarding participation of state agencies in the Association*

The laws of the Republic of Belarus do not provide an express restriction or prohibition of state bodies’ involvement in the Association. Based on our analysis of the laws of the Republic of Belarus we arrive at the conclusion that participation of state institutions in the Association is permissible. Under cl. 3, art. 46 of the Civil Code of the Republic of Belarus, legal entities which are non-commercial organizations may be found in the form of consumer cooperatives, social or religious organizations (associations) funded by the owner of institutions, charity funds and other types of funds, and also in other forms as provided for by legislative acts.

Based on the above, we may arrive at a conclusion that state bodies having proper rights of a legal entity are entitled to be members of associations of legal entities (the fact that a state body has proper rights of a legal entity is always specified in the legal act regulating such state institution’s activities). This position (claiming that state authorities having proper rights of a legal entity fall within the category of ‘non-commercial organizations’ and, accordingly, are entitled to be members of associations of legal entities in the form of ‘unions’ and ‘associations’) has been confirmed during our verbal consultation with a registering body specialist.1

- Association members preserve their legal autonomy and rights of a legal entity/individual entrepreneur.

- Association members do not have any proprietary right to its property: this means that Association members do not collect any profit/dividends from Association’s activities and incomes.

- Association members are exposed to subsidiary liability under its obligations to the extent and in the manner as prescribed by the Association Charter.

- Association is based on fixed membership. The laws do not provide for a difference between the status of a member and that of a founder.

- Admission of new members can be carried out only upon consent of active members.

However, the laws of the Republic of Belarus do not provide for a definitive regulation on how such consent must be expressed and under which procedure: whether personal consent of each Association member for admission of a new member is required, or the consent of active members shall be documented by means of a resolution of an Association body in the manner prescribed by the Charter (for instance, by the decision of the Association’s supreme body – General Meeting, adopted by a majority of at least 2/3 or 3/4 or 1/2 of votes of the total amount of members’ votes).

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1 In particular, this can be exemplified by cl. 1 of the Regulation on the Quality Control Department of the Ministry of Education of the Republic of Belarus, approved by Resolution No. 976 of the Council of Ministers of the Republic of Belarus dated 31 July, 2006.
A detailed method of decision making and consent granting may be stipulated in the Charter. In practice, charters of associations do sometimes contain a similar procedure for decision making on the admission of new members.

Nevertheless, based on the existing wording of cl. 3, art. 123 of the Civil Code of the Republic of Belarus: “A new member may join an association/union upon consent of such association’s/union’s members,” we believe that to admit a new member, an association needs a consent by all of its members, in due form. The charter may define relevant forms of such consent: signing ballots and dispatching them to the Association, or absence of objections to the admission of the new member within a definite period from the date of notification about the scheduled decision, or another variant.

When choosing Option 1 as IT cluster’s organization model, we may additionally explore this issue, and specifically by directing official inquiries to competent state authorities.

- A member of the Association is entitled at its discretion to withdraw from the Association following the end of the financial year. In such a case, such member will incur subsidiary liability under Association’s obligations in proportion to its membership fee within two years from the date of withdrawal, provided such obligations were created during the membership of such member.
- A member of the Association may be eliminated from the Association by the decision of the other members, in cases and in the manner as prescribed by its Charter.
- Association membership may be graded (for instance: full member and associated member). In some cases, membership (or member status) may be subject to certain requirements – for capital, for a license, etc. All these details may be stipulated by the Association Charter.

**Fall-back and withdrawal from Association**

Along with the goals of single fund-raising for master courses, the Association may also exercise different, wider functions.

Thus, the Association may become an effective tool to support the interaction between the IT community and the government bodies and associations (for instance, High Tech Park), may be a kind of an operational hub, which will generate proposals to develop legislation on information technology.

In case any Association member(s) at any moment does no longer wish to be an Association member, for instance, if the Association shifts its focus from one IT profile (for example, electronic health services) to another (for example, to informational support of logistics), this issue may be resolved as follows.

**Formalization of withdrawal of uninterested entities from the Association**

As has been stated above, withdrawal from the Association may be carried out only upon completion of the financial year. To withdraw from the Association, member’s declaration of intent suffices. No permissions or consents by other Association members or Association itself are required.

As procedural matters of Association’s activities are not regulated by the laws, we suggest the following method of members’ withdrawal from the Association: by analogy with business entities, an Association may convene annual Meetings of Members on a particular date at the end of the financial year. Such Meetings will, particularly:

- sum up results of activities for the year that ended;
- address issues regarding sizes of membership fees and procedures for their depositing;
- define lines of action for the next year;
- where necessary, determine the list of Association members for the next year, with due account for the stated lines of activity.

Moreover, be notified that we have only outlined a tentative scope of issues to be addressed at regular meetings of Association members.
Thus, at an annual Meeting, each uninterested member will be able to express its intent to withdraw from the Association.

**Minimizing membership fees while preserving Association membership status**

The current laws do not define minimum or maximum limits for membership fees of Association members and do not define any procedures on their establishment or calculation. Thus, where a master course attractive for some Association members is over, membership fees for such members may be minimized (for instance, 1 BYN), instead of starting a procedure of withdrawal of such members. The methods of establishment and modification of membership fees may be stipulated in detail in the Association Charter.

**Association property constitution procedure**

When creating the Association, Association members shall contribute membership fees, which will be used to fund initial Association activities.

Further funding for the Association will be carried out by means of recurring fees donated by its members; the frequency and the sizes of such fees (or procedure of their specification) shall be defined by the Association Charter.

Regarding the possibility of exemption of some members from membership fees

The legislation of the Republic of Belarus does not contain an immediate solution of this issue. We believe that membership fees are one of the attributes of membership of an entity in the Association. If an entity stops paying its membership fees, this entity may face actual termination of its membership in the Association.

The necessity of paying membership fees is indirectly stated by cl. 1, art. 123 of the Civil Code of the Republic of Belarus, which reads that “a member of an association (union) is entitled at its discretion to withdraw from the Association (union) following the end of the financial year. In such a case such member will incur subsidiary liability under Association’s (union’s) obligations in proportion to its membership fee...”.

If any member were, for any reason, exempt from payment of membership fees, we would recommend that you establish a minimal membership fee for such member, but not to abolish membership fees in full.

Fees made by Association members are divided into recurring (established by the Association Charter and shall be paid regardless of any events or circumstances) and special-purpose membership fees (to be paid for special purposes).

The current laws do not establish any requirements for the minimal size of Association’s property. Associations do not have authorized funds.

The Association’s LLC will also contribute to the formation of Association’s property, by means of payments to the Association (as the participant) of shares of profits of the Association’s LLC.

**Association’s constituent document**

The Association Charter as approved by its members is the Association’s constituent document. The Charter must contain data as prescribed by clause 2, article 122 of the Civil Code of the Republic of Belarus.

The Association Charter must contain:

- name of the legal entity;
- principal place of business;
- corporate objectives;
- business management procedures;
- procedures of formation of Association’s property;
- amendatory procedure for the Association Charter
terms and conditions regarding composition and competencies of Association’s management bodies, and procedures of their decision-making, in particular on issues which shall be resolved unanimously or by a special majority of Association members’ votes

terms and conditions regarding the procedure for division of property left after Association winding-up.

Association management structure

Operational structure and decision-making procedures of Associations are not regulated by law.

Optional Association business management structures are a two-tier or a three-tier management structure:

- In case of the three-tier structure, the Association’s governance structure will comprise:
  - a supreme management body – the General Meeting (Conference, Assembly, or another name). This body exercises representative capacities and includes representative of each of Association members.
  - a collective management body – the Board (Council, Board of Directors, Association Board, or another name). This body may comprise any number of elected members (at least 2). Competence, methods of electing, decision-making procedures and other issues of the Board’s activities will be defined by the Association Charter.
  - a sole executive body – Chairman (Director, President or another name). Chairman may exercise operating management of Association activities.

For the purpose of organizational functions, a Secretariat may also be created within the Association. A supervisory/inspection body (being a collective or a sole body) may be formed in order to supervise and control Association activities.

- In case of the two-tier structure, the Association’s management structure will comprise:
  - a supreme management body;
  - a sole executive body;
  - as necessary – Secretariat and a supervisory/inspection body.

Considering the choice of an appropriate Association management structure, we should note that the current laws do not delimit the competencies of its bodies. In this regard, Association founders are entitled to establish a most suitable management format all by themselves.

Thus, if the number of Association members is relatively short (approximately from three to six entities), then we believe that a two-tier management system will suffice: the General Meeting of Association members comprising such short number of members will be able to meet swiftly to make relevant decisions. The executive body, in such format, will give effect to decisions made by the Association’s supreme management body (the General Meeting), and exercise a number of independent functions.

Where a big number of Association members are expected, then convening the General Meeting of Association members, securing its quorum and rendering critical decisions at the General Meeting would be quite difficult. In such a case, a three-tier management model may be chosen which implies as follows:

- the General Meeting of Association members will mostly exercise representative capacities, define the lines of Association activities, decide on the admission of new members and withdrawal of former members, etc.;
- the collective management body – the Board of Directors, the Supervisory Board, the Council, etc. The composition of the collective management body will be in such a case formed via elections at general meetings of Association members. The collective management body will in such a case comprise a certain quantity of elected members who will actually be in control of Association
activities (i.e. approve current development plans, bid documentation, take decisions on principal transactions of the Association’s LLC and on participation in government purchases, etc.);

- executive body – director (president, chairman, etc.) who will exercise representative capacities, enforce the decisions of supreme management bodies and manage Association’s current operations.

Summarizing the description of the Association as the tentative center of the IT cluster, we should note that the legal control of associations’ and unions’ activities in the Republic of Belarus is today extremely fragmentary and is only limited to articles 121 to 123 of the Civil Code of the Republic of Belarus. In this regard, the crucial aspects of Association activities mentioned above should be thoroughly specified in the Association Charter during its preparation, with due account for all members’ interests.

Implementation of IT cluster’s commercial activities by means of creation of a limited liability company (LLC)

Description of the LLC to be created by the Association for its business operations:

- Such LLC is a commercial entity endowed with property allocated to such LLC by its founder and owning assets acquired in the course of its operations.
- The primary corporate objective of the Association’s LLC is carrying out business activity by means of software development under private orders and participation in government procurement procedures related to software engineering and other procurement procedures.
- The LLC will remit profits raised on its business activities (except resources necessary for its operating activities) to the Association, by means of distribution of profits and payment of profits to its participants, for the further use of these resources for educational, research and scientific purposes.
- In order to optimize the tax burden of the Association’s LLC, you can consider the option of Association’s LLC’s entry into the High Tech Park.
- Actual recruitment of LLC staff (its quality and quantity) shall be selected subject to LLC’s short- and long-term goals: the necessity to develop a particular product, to participate in a particular tender, etc. Staffing may also be performed using teams of IT companies who are Association members, for instance via dual jobholding.

Quantitative composition of Association members

Regarding the composition of Association’s LLC’s members, we propose that the following possible variants be considered:

**Variant 1.** Association itself may become the sole shareholder of the Association’s LLC.

**Advantages of this variant:**

- Simplicity and operational flexibility in terms of LLC management and the procedure for adopting crucial decisions on the LLC (read more about LLC management in the section “Association’s LLC’s business management procedures”).
- the Association will be able to control and supervise LLC’s activities and render crucial decisions (because all the decisions pertaining to the competence of LLC’s supreme management body will be adopted by the Association singly).
- All profits gained by the LLC from its business activities will be transferred to the Association as the sole shareholder.

**Disadvantages of this variant:**

- Lack of direct interest of commercial organizations – members of the Association – in commercial activities, because earnings gained from business activities will not be distributed to Association members. Thus, this variant excludes direct profit earning by Association members on LLC’s activities.
Variant 2. Association and its members (commercial organizations) may become shareholders of the Association’s LLC.

**Advantages of this variant:**
- Business organizations (Association members) will be able to participate directly in profit making from the activities of the Association’s LLC and in the management of LLC’s activity and adoption of crucial strategic decisions.

**Disadvantages of this variant:**
- More complicated mechanisms of LLC management (in order to render any critical decisions, it will be necessary to convene and to hold a General Meeting of participants, or a meeting of the Board of Directors).
- LLC participants will be able to block adoption of some decisions pertaining to the competence of the General Meeting of LLC’s shareholders. The legislation on business entities (art. 34, 35 of the Business Companies Law) contains some mandatory clauses prescribing that a number of decisions shall be adopted unanimously by all shareholders (for example, decisions on LLC reorganization and liquidation) or by a qualified majority of at least 2/3 or 3/4 of votes (for example, decisions on any amendment of the Charter shall be adopted by a qualified majority of at least 2/3 of votes of all LLC's shareholders).
- It is supposed that the Association’s LLC will annually change its profile of activities, and will participate in public procurement and tenders of different directions. In this regard, presumably, the list of members of the Association’s LLC should be changed from time to time, depending on the line of LLC’s activity in a particular period. The procedure for changes in members is permissible in three basic ways: by withdrawal from the list of shareholders, by the admission of a new shareholder, and by the alienation of a share in the authorized fund.

Withdrawal of the shareholder does not depend on the willingness of other LLC’s shareholders. Such withdrawal implies that the LLC must settle accounts with such withdrawing shareholder: the LLC must pay the real cost of its share and the portion of profits pertaining to its share.

Admission of a new participant requires approval by acting participants, and, accordingly, can be blocked. Alienation of a share in the authorized fund implies compliance with certain corporate procedures. A share may be sold to any third party only if acting LLC shareholders have renounced to exercise their pre-emption right to buy such share, and if the LLC itself has denied to exercise its right to buy such share. Thus, a risk still exists that acting shareholders can block admission of a third party to the LLC.

**Variant 3.** Founding of LLC by members of the Association (without Association itself)

**Advantages of this variant:**
- Commercial organizations (Association members) will be able to participate directly in profit making from the activities of the Association’s LLC and in the management of LLC’s activity and adoption of crucial strategic decisions.

**Disadvantages of this variant:**
- The Association will not be able to affect decisions adopted by the Association’s LLC.
- The Association will not be able to participate in profit earning from LLC’s activities.
- No guarantees that Association members who draw profits from LLC’s activities will pay Association membership fees from their profits, as Association members will independently decide on the distribution of their profits.

**Variant 4.** Creating several LLCs by the Association and its members (in the format: one LLC means one profile).
In this variant, the Association and its members will create several LLCs, and the Association and an Association member (Association members) interested in realizing of a particular profile (business line) of the IT cluster will become participants of each of the LLCs.

**Advantages of this variant:**

- The Association will be able to control activities of each of the LLC and the decisions adopted by it.
- Commercial organizations (Association members) will be able to make profits from LLC’s activity directly.

**Disadvantages of this variant:**

- In fact, the ‘profiled’ LLCs will lose their actuality upon completion of a particular program and will be idle.

The Association is a non-profit entity and must primarily pursue non-commercial goals. Accordingly, if the activity of the Association is reduced primarily to participate in several commercial entities (LLCs), there will be a risk of compulsive reorganization of the Association into a commercial entity.

**Participation in Association’s LLC**

- Participation in the LLC will be fixed: data on LLC participants will be recorded in the LLC Charter and will be entered in the Unified state register of legal entities and individual entrepreneurs.
- Founders of a business entity are citizens (natural persons) and/or legal entities who have decided on the foundation of such entity. After the state registration of the Association’s LLC, its founders will become its participants.
- The number of LLC participants may not exceed fifty.
- LLC participants have liability rights in respect of the LLC and may have proprietary rights, but only to the property, which they have transferred as their contributions to the authorized funds.

**Procedures for formation of Association’s LLC property**

The LLC owns:

- the property transferred by founders to its authorized fund as contributions;
- the property acquired by the LLC in the course of its business activities;
- revenues acquired through the use of property (products, profits, etc.) unless otherwise provided for by law or the agreement on usage of such property;
- property of unitary enterprises and institutions founded by the LLC;
- property acquired by the LLC on other grounds permitted by law.

**Association's LLC's constituent document**

The Charter is the Association’s LLC’s constituent document. The Charter must define:

- name of the LLC;
- principal place of business;
- corporate objectives, and to the extent provided by applicable law – LLC’s nature of business;
- size of the authorized fund;
- rights and obligations of participants;
- structure, election or formation procedure, composition, and competencies of LLC’s bodies;
- business management procedures;
- decision making procedures of its management bodies, and specifically regarding decisions requiring unanimous voting or special majority (at least two thirds, three-fourths, etc.) of votes of its management bodies;
- conditions and procedures for profit and loss distribution;
• list of representative offices and branches;
• LLC’s and its participants’ liability;
• approval procedures for accounting (financial) reports (data from income and expense record books) of the company and of its representative offices and subsidiaries;
• procedures and extent of disclosure of information on the LLC to its participants;
• other data as provided for by law.

Association’s LLC’s business management procedures

The structure of management bodies of business companies is specified by the Business Companies Law. If an LLC consists of only one participant, then general meetings of participants (as the prescribed form of decision making) shall not be convened and held. All decisions which, pursuant to the Business Companies Law, pertain to the competence of the general meeting of participants shall be adopted as written decisions of the sole participant (the Association), and such decision will be taken by such sole participant at its sole discretion. In case an LLC with several participants is created, the General Meeting of participants will be the supreme management body, and will adopt its decisions during regular and extraordinary meetings. Pursuant to the Business Companies Law, the following structures of management bodies of LLCs with sole participant are feasible:

• Two-tier structure of management bodies:
  • Management bodies: Sole participant and executive body (sole or collective);
  • Controlling body (Auditor or Auditing Commission).
• Three-tier structure of management bodies:
  • Management bodies: Sole participant, Supervisory board (Board of directors), executive body (sole or collective);
  • Controlling bodies (Auditor or Auditing Commission).

In this variant, the Association is the sole participant of the LLC. This means that all decisions relating to LLC’s activities and pertaining to the competence of the LLC’s supreme management body will be taken by the Association itself at its sole discretion.

On behalf of the Association (as the only participant of the LLC), decisions relating to the LLC may be rendered in different ways, subject to approaches specified by the Association Charter. Thus, it would be rational to stipulate the following:

• all decisions on behalf of the Association (as the founder (participant) of other legal entities) will be taken by the director (chairman, president) of the Association singly
• all decisions on behalf of the Association (as the founder (participant) of other legal entities) will be taken by the Association’s collective management body (Board of directors);
• all decisions on behalf of the Association (as the founder (participant) of other legal entities) will be taken by the Association’s supreme management body (General Meeting of the Association);
• some issues relating to Association’s LLC’s activities will fall under the competence of the Association’s executive body, and the rest – under the competence of other Association’s bodies.

In case an LLC with several participants is created, the General Meeting of participants will be the supreme management body, and representatives of all participants will take part in such meetings. Decisions will be adopted at such meetings according to the decision-making procedure provided by the Charter and by the Business Companies Law. The procedures for convening and holding General Meetings of participants will have to be complied with, and the competence of General Meetings of participants will have to be secured so that decisions rendered at such meetings be legally relevant.
Regarding the question of a concrete structure of the Association’s LLC’s management bodies, we must note that each of the proposed options has its peculiarities, which in each case may be treated as positive or negative. In choosing a concrete model of management bodies, you should consider the following factors:

- LLC’s tentative scope of activity. If a large scope of activity and, accordingly, a large scope of document flow were assumed, then it would be more rational to create a Supervisory Board within the LLC and assign maximally broad powers directly to its competence, and thereby to lessen the load on other Association’s bodies.

- The level of integration of LLC’s functions and the Association itself. Thus, if the LLC (as a facility for entrepreneurial activities) will be treated as some kind of a “structural subdivision” taking care of own line of activity and will be able to fulfill its functions autonomously by means of appointment of persons to be in charge of the commercial sphere, then it would be rational also to elect such persons in the LLC’s Supervisory Board and to the position of LLC’s head (CEO). In such a case, these persons will be able to manage LLC’s activities all by themselves to the uttermost.

- The degree of confidence in LLC’s head (CEO). If a Supervisory Board is created by the LLC, this body will also be able, apart from LLC management, to control and supervise LLC head (CEO).

- Even if a three-tier management structure be created (a Supervisory Board be elected) you should remember that key strategic issues of LLC’s activities (such as LLC reorganization and dissolution, increase of LLC’s authorized fund, decision on securities issue, election of LLC’s head (CEO) and early termination of his powers, etc., pursuant to art. 34 of the Business Companies Law) will anyways pertain to the exclusive competence of the Association as the sole participant. Therefore, the Association will still be able to control LLC’s activities.

In order to provide funding for non-commercial lines of activities (scientific research, education, and training, etc.) the Association may create non-commercial entities in the form of institutions or funds.

A. Institution

An ‘institution’ may be set up by one founder only who has to exercise control and provide funding for the institution. Financing of the institution by other persons may only be carried out under agreements. Property transferred to an institution is owned by such institution based on operational management. An ‘institution’ may be created in order to exercise managerial, social/cultural or other functions of non-commercial nature and shall be financed only by the owner (wholly or partially). An ‘institution’ is generally created to exercise a practical function (educational or scientific activities, provision of services if such services are not provided for commercialization (e.g., mediation), etc.).

Institution features

- An ‘institution’ is an entity created by the owner to exercise managerial, social/cultural or other functions of non-commercial nature and financed by such owner (wholly or partially).
- An institution may be created directly by the Association or by the Association’s LLC.
- An institution is not entitled to alienate or otherwise dispose of its property (including property acquired from funds allocated to it) without owner’s consent unless otherwise provided by legislative acts.
- If, according to the constituent documents, an institution has a right to carry out any entrepreneurial activities, then such incomes drawn from such activities and property acquired of such activities shall be transferred to the institution for to be singly administered by such institution and shall be recorded on a separate balance sheet, unless otherwise provided by law.

B. Fund

A ‘fund’ is a non-commercial entity without membership aimed at the social benefit. Any property transferred to a fund will belong to it permanently. Any person/entity may participate in the formation of fund’s property via contributions. A fund is an organization created predominantly for the accumulation of monetary resources to finance and support various social events and activities.
Fund features:

- A ‘fund’ is a non-commercial entity without fixed membership founded by a citizen (citizens) and/or a legal entity (legal entities) on the basis of free asset property contributions which pursues aims related to social development, charity, culture, education, athletics & sports, science or other goals of public utility as specified by such fund’s charter.
- Either Association or the Association’s LLC may be the founder of the Fund.
- The Fund’s principal functions will be financing the educational and scientific research programs to be implemented within the framework of the Association.
- The sources of the formation of the Fund’s assets will be the property assets transferred to the Fund by its founder(s), incomes from events/activities pursuant to the Fund’s Charter, incomes from business activities pursuant to the Fund’s Charter, and other legitimate incomes.

The Fund is obliged to publish reports on the management of its assets annually. The procedures and the composition of such reports are established by the current laws.

3.1.2. Basic element of the structure – LLC

**Figure 11: Organizational form of the IT cluster based on LLC (below – LLC-1)**

This variant features a non-commercial organization founded as a ‘limited liability company,’ as the primary structural element, the coordination center to represent the interests of IT cluster member organizations (the features of an LLC are described in detail in the Option 1, clause II).

Furthermore, as LLC1 has a right to carry out business activities directly, creating a separate commercial entity is not mandatory but optional, in the Option 2.

The benefits of creating a separate commercial entity (LLC2) within the framework of the IT cluster are as follows:
• If a separate LLC2 is created, then the LLC1 will be the sole founder of such LLC2, which will greatly simplify the management and decision-making procedures of the LLC2 pertaining (pursuant to the Business Companies Law) to the competence of the General Meeting of participants of the LLC2;

• A single coordination center (LLC1) will be preserved within the structure of the IT cluster, and LLC2 will be acting as a tool to implement the IT cluster’s commercial functions.

In terms of description of the remaining elements, the structural concept of the IT cluster has no changes. Therefore, the description of the IT cluster’s structural elements as outlined in the scheme for Option 2 is the same as in Option 1 (except the provisions on the Association as the IT cluster’s coordination center).

In this regard, we propose only strengths and weaknesses of the Option 2 here, as compared to Option 1.

Table 9: Strengths and weaknesses of the Option 2 here, as compared to Option 1

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>More detailed and developed legislation regulating the creation and</td>
<td>Restricted maximum number of participants (at most 50)</td>
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<tr>
<td>operation of the LLC (compared to the legal regulation of associations)</td>
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<tr>
<td>Legally mandatory and widely used mechanisms of corporate transformations</td>
<td>The shares must be distributed among the LLC1 participants before incorporation</td>
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<td>within the structure (in particular, explicit and transparent procedures</td>
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<td>for withdrawal and exclusion of participants, clear rules of voting on</td>
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<td>specific issues, a division of competences among the management bodies,</td>
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<td>etc.).</td>
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<td></td>
<td>Strict mandatory control of corporate decision-making and the number of</td>
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<td></td>
<td>voices needed for particular decisions. In particular, where participants</td>
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<td></td>
<td>wish to provide additional financing for LLC1 by means of augmenting the</td>
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<td>authorized fund on account of all LLC’s participants, pursuant to p. 1,</td>
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<td></td>
<td>art. 105 of the Business Companies Law, this will be allowed only by a</td>
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<td>unanimous decision of the General Meeting of participants. An increase of</td>
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<td>the authorized fund on account of one or several participants is also</td>
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<td>allowed by a unanimous decision of all participants</td>
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<td></td>
<td>Inconsistency of the tentative goals of the future IT cluster and those</td>
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<td>of LLC1. LLC1 is a commercial entity, and its primary aim is commercializing</td>
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<td>on its activities. According to the information delivered by the Client,</td>
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<td></td>
<td>the IT cluster’s primary goal is an alliance of some interested</td>
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<td>organizations to implement common interests and coordinate joint actions</td>
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<td>and goals</td>
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<td>Individual participants and/or groups of participants will be able to</td>
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<td>block a number of decisions, which pertain to the competence of the</td>
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<td>General Meeting of LLC1’s participants. A number of decisions will require</td>
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<td>a unanimous</td>
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<tr>
<td>Strengths</td>
<td>Weaknesses</td>
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<td>voting and/or a special majority (for instance, decisions on any corporate restructuring, dissolution on any significant transactions (i.e., transactions worth more than 20% of the LLC1’s book value), and other decisions). This poses a risk in terms of management and control, in case some decisions made by the IT cluster not correspond to the interests of particular participants.</td>
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</table>

*Source: REVERA team analysis.*

In view of the above and with due account for the quite large number of potential participants of the IT cluster and the strict control procedures pertaining to LLC1, we believe that Option 1 is most reasonable in terms of controllability of the Association and flexibility of key decision-making.

### 3.2. Contractual links of the IT cluster

Based on the proposed models of IT cluster organization in terms of optimal business legal forms, the relations of the IT cluster with either entities will be formalized using the below contractual links. The contractual links are applicable to the situations where the IT cluster is created in the form of an LLC managing company or as an Association.
3.2.1. Relations between the IT cluster and its participants

Some relations between the IT cluster and its participants will include internal (corporate) relations within the IT cluster. Relations of such kind have been examined in detail in section 3.1.

The relation between the IT cluster and its participants beyond the corporate participant in the IT cluster will be mediated by contractual relations and are examined in this section. Such relations are:

- financing of the IT cluster;
- the attraction of IT cluster participants as subcontractors for various projects in information system development.

Financing of the IT cluster

Financing of the IT cluster, regardless of the chosen option hereof, may be carried out by means of a gratis sponsor aid agreement. Under such agreements, various entities may also render free services, carry out works for the IT cluster, and transfer property rights including exclusive rights to intellectual property. Such financing implies that the goals of such gratis sponsor aid must be complied with as defined by Decree No. 300. In this case, the most fitting goals are:

- creation and development of physical infrastructure (as a rule, exactly this goal is used by sponsors, if there are no other applicable goals);
• issuance of educational editions and teaching aids, catering for students of educational institutions.

Apart from the goal, such an agreement shall also define the size of such aid, types of products (works or services) to be purchased on the funds granted, and the procedures for reporting on the use of the funds granted. A model form of such an agreement has been approved by Resolution No. 779.

Provisions of financing to the IT cluster for other purposes may be carried out based on compensated (fee-based) agreements (for instance, loan agreement or another type of civil law agreements).

**Attracting IT cluster participants to perform contracts under government procurement**

IT cluster participants may be attracted by the IT cluster’s subsidiary LLC in order to carry out projects on information system development of the Belarusian state and society. These can be carried out based on commercial contracts between a particular participant of the IT cluster (a particular IT company) and a person participating in government procurement (IT cluster’s subsidiary LLC).

3.2.2. Relations of the IT cluster and BSU in terms of financing of the practice-oriented master course and the laboratory for practical training under the auspices of the BSU

A portion of funds for the master courses will be provided by master students’ fees. Financing in excess of funds received as tuition fees may be carried out by one of the following methods:

**A. Agreement on gratis (sponsor) aid**

Within the scope of such agreement, the IT cluster may provide monetary resources, property, works, services, and exclusive rights to BSU on a grant basis. The possibility of such financing is explicitly specified by cl. 1, art. 137 of the Education Code. In this case, one of the following goals must also be complied with:

- creation and development of physical infrastructure (as a rule, exactly this goal is used by sponsors, if there are no other applicable goals);
- issuance of educational editions and teaching aids, catering for students of educational institutions;
- other goals (upon consent of the President of the Republic of Belarus).

‘Teaching aids’ are devices, equipment units, tools and instruments, training aids, computers, computer networks, audio-visual aids and other tangible assets required for educational activities (cl. 4, art. 139 of the Education Code). Thus, gratis (sponsor) aid agreements may wholly mediate all relations for the financing of the laboratory.

**B. Agreement on cooperation of an educational institution with a personnel orderer (IT cluster or its subsidiary LLC)**

IT cluster or its subsidiary LLC may conclude an agreement with the BSU on their interaction in training master students (art. 210 of the Education Code). Under such an agreement, the following lines of interaction between the BSU and the IT cluster will be carried out:

- participation of the IT cluster in upgrades of educational courses (coordination of educational courses with the IT cluster, amendments of educational courses at IT cluster’s suggestion);
- development of BSU’s physical infrastructure;
- the arrangement of students’ practical trainings under separate contracts;
- employment assistance for graduates;
- other cooperation lines as stipulated by the parties in the agreement.
Under such agreement, the responsibility of the IT cluster or its subsidiary LLC would typically include employment assistance for graduates having work assignments from their school. However, as the master courses will be fee-based, this clause will not be applied (no work assignments for the master students). In addition to that, the agreement may stipulate other interaction terms, in particular regarding procedures and condition of employment of graduates.

Resolution No. 972 has approved the procedure for the conclusion and the model agreement on cooperation of an educational institution with a personnel orderer. However, financing under such agreements must be carried out in compliance with the requirements on gratis (sponsor) aid as specified above (including the compliance of usage goal to the legislative requirements, reports of grantees on the intended use, grantee’s accounting of all transactions involving such aid, etc.).

Conclusion: in the initial stage of the Belarusian IT cluster concept, it would be rational to make use of a gratis (sponsor) aid agreement as a tool of additional financing for the master course (where it would be needed in excess of the sums received as tuition fees from master students).

At a later stage of the Belarusian IT cluster concept, when all processes of interaction between the BSU, the IT cluster, the IT companies and the master students have been adopted and debugged (including procedures of IT cluster’s proposals on the content of educational programs, practical training for master students, etc.), a cooperation agreement may be concluded. Such an agreement implies a closer interaction between the mentioned stakeholders, provides for a larger scope of mutual rights and obligations of the parties and amplifies the scope of the gratis (sponsor) aid agreement.

3.2.3. Relations of the IT cluster (its participants) and master students enrolled in the practice-oriented master course

The relationship between the IT cluster (its participants) and undergraduates is discussed in detail in Section 4.1.

3.2.4. Relations between the IT cluster (its participants or tools) and the state, in particular as part of government procurement

The IT cluster does not presuppose a permanent staff. This platform will be used to initiate particular types of activities. Therefore, the best option for building relations within the frame of participation in public procurements is to execute them on behalf of the IT cluster’s subsidiary LLC. The choice of a specific commercial contract concluded by the procurement procedure, will be determined within the frame of each particular procurement procedure separately. As a rule, customers publish such contracts as part of tender documents.

Incomes received from the implementation of projects in the field of informatization can be spent on the financing of the master’s courses and/or the BSU laboratory, on reimbursement of master students’ tuition fees, or other purposes.

Cooperation with other IT companies for the implementation of contracts under procurement procedures can be realized in two ways:

- Involvement of IT companies in subcontracting by the IT cluster’s subsidiary LLC (contracting or subcontracting contract – depending on the type of the main contract in the procurement procedures). In this case, it is assumed that IT companies will take part in the fee-based implementation of projects on informatization of the Belarusian state and society. We believe that exactly this option would normally be applied if IT companies’ fee-based participation in such government projects were suggested.

- A gratis (sponsor) aid from IT companies in favor of the IT cluster’s subsidiary LLC in the form of gratis works and/or services under respective contracts. This option can be applied if the budget of a particular project is small and there is no possibility to attract an IT company for fee-based
subcontracting, or an IT company wishes to participate in the project pursuing marketing, image, and other purposes, which are not directly related to making profits.

3.2.5. Relations between the IT cluster and potential grantors providing financing for the IT cluster

Due to the fact that the primary cost-consuming activity is supposed to be realized through the IT cluster’s subsidiary LLC, it is most advantageous to accumulate the main portion of financial resources in this LLC.

As a rule, grants are provided in the following forms:

- Gratis donations by Belarusian entities. These relations are formalized by gratis sponsorship agreements, as has been indicated above.
- Gratis donations by foreign entities (foreign gratis aid), including monetary funds, interest-free loans, property assets and property rights. A special procedure for receiving, accounting and using of foreign gratis aid has been defined by Decree No. 5. Foreign gratis aid has purposive character. The following purposes, from among those stipulated by Decree No. 5, are most appropriate within the frame of the Concept:
  - carrying out scientific research, development, training, implementing research programs;
  - development of physical infrastructure of state institutions, construction, repair (reconstruction) of social facilities.

Thus, according to the general rule, foreign grants may be used for the mentioned purposes. At the same time, such donations must be registered in the Department of Humanitarian Activities of the Property Management Directorate of the President of the Republic of Belarus (hereinafter referred to as the Department) (exception – gratis donations in the form of goods/products worth less than 500 basic units – 11 500 BYN or ca. 6 000 USD). Grants in the form of cash assets must be credited to a charity account and shall be spent exclusively for the purposes specified.

If an entity wishes to use grants for any other purposes than prescribed, it is necessary to negotiate the approval of such objectives by the Department and the President (if the amount of such aid is more than 500 basic units – 11 500 BYN or ca. 6 000 USD).

- Other forms of grants at the discretion of grantors. Grantors may define other forms of financing. For instance, it may be supported in the form of privileged credits or loans. Such forms of financing that do not fall under the above criteria do not as well fall under the special legislation requirements and can be received without restrictions.

3.3. Financing of the IT cluster and other related programs

Within the frame of the proposed Concept, the financing is realized in favor of the following entities: i) the IT cluster, ii) the BSU master’s course (including the facilities for master students’ practical training), iii) to master students, to reimburse their tuition fees. The options to finance such entities are presented below.

3.3.1. Financing of the IT cluster

It is assumed that the IT cluster will receive financing from the following sources:

A. IT companies (both IT cluster participants and other IT companies).

Financing from IT companies (IT cluster participants) may be carried out within the frame of corporate relations (discussed in section 3.1). Beyond the corporate relations, the IT cluster may be financed by its participants and other IT companies within the frame of contractual relations. This variant is considered in detail in section 3.2.1.

B. Attracted grants, sponsorship, and other sources of gratis (sponsor) aid.
Relations implied by this financing source are discussed in detail in section 3.2.4. 

C. State support.

The IT cluster can receive state support for its activities. State support can be provided in various forms, and each such form has special requirements and procedures. In particular, the following can be used:

- state financial support (Decree of the President of the Republic of Belarus No.106 dated 23 March 2016);
- state support of innovation infrastructure entities (Decree of the President of the Republic of Belarus No. 1 dated 3 January 2007, No. 229 dated 20 May 2013);
- using funding from Investment and Innovative Funds (Decree of the President of the Republic of Belarus No. 357 dated 7 August 2012, Resolution of the Council of Ministers of the Republic of Belarus No. 9 dated 5 January 2013).

3.3.2. Funding for the BSU master course and the facilities for master students’ practical training

A detailed description of the options for financing for master students is given in section 4.1.

3.3.3. Funding for the tuition fee of master students

A detailed description of the options for financing for master students is given in section 4.2.

3.4. ICT-cluster taxation

3.4.1. Overall review of taxation systems applicable for the ICT cluster and its tools (commercial entities, created by the ICT cluster, educational institutions and laboratories, created as institutions and funds).

The Republic of Belarus has several systems of tax calculation and payment. For the IT cluster activities, the following systems (regimes) available to taxpayers shall be examined:

- general tax regime;
- simplified tax system;
- preferential tax regimes.

The above tax systems (regimes) are to be applied by all entities (i.e., both commercial and non-commercial legal entities) where any profits from any entrepreneurial activities are generated. Key aspects of the mentioned tax systems are examined below.

A. General tax regime (GTR)

Tax object: gross profit, and dividends and other income, accrued by Belarusian entities.

The ‘gross profit’ is an amount of profits on sales of goods (works, services), property rights and non-operational incomes net of the amount of non-operational expenses.

Basic profit tax rate is 18 %, and dividend tax rate is 12 %. The calendar year is the taxable period for the profit tax. A calendar quarter is the reporting period for the profit tax, and calendar month is the reporting period for the dividend profit tax.
The amount of the profit tax for the reporting period is calculated on an accrual basis since the start of the reporting period as the product of the tax base net of tax-exempt profits, and in the 4th quarter also by the amount of losses transferred to the profits of the current reporting period, and the tax rate.

A profit tax return for the reporting period to date shall be submitted by taxpayers to a local tax authority on a quarterly basis, on or before the 20th day of the month following the reporting quarter, which has ended.

Payment of the profit tax must be performed within the taxable period, after the results of the reporting period, which has ended, on or before the 22nd day of the month following the reporting period, which has ended.

**B. Simplified tax system (STS)**

STS’s scope of application is activities of small business entities having an income level below a certain statutory level. Therefore, STS may be applied by an entity if it simultaneously complies with the following criteria: 1) average work force, and 2) gross proceeds within initial nine months of the year proceeding the year of application for STS. The requirements of these criteria shall be as follows:

- the average work force of such entity during such period shall not be more than 100 persons;
- gross proceeds within initial nine months of such calendar year shall not exceed 1,159,800 BYN (approximately equals to 596 000 USD).

However, entities having an average work force of not more than 50 persons within the period from the beginning of the year through the reporting period may also be exempt from VAT, if a number of their gross proceeds on an accrual basis since the start of the year is less than 1,058,400 BYN (approximately equals to 544 000 USD).

Where an entity during the calendar year exceeds the indicator of gross proceeds on an accrual basis of 1 542 600 BYN (approximately equals to 793 000 USD) and/or exceeds the work force indicator (more than 100 persons), then such entity must switch to the CTS as from the start of the following reporting period.

The Simplified Tax System defines that gross proceeds from sales of goods (works, services), property rights and non-operational incomes are the tax base.

In general, the STS’s feature is that it replaces some payments by a single tax, which is calculated via a simplified procedure. At the moment, business entities may use the following STS tax rates:

- 5% – for entities and individual entrepreneurs that do not pay the value-added tax. As stated above, only entities having a work force of not more than 50 persons are allowed to use this rate and be exempt from the value-added tax, if a number of their gross proceeds does not exceed 1 058 400 BYN (approximately equals to 544 000 USD), and individual entrepreneurs;
- 3% – for entities and individual entrepreneurs that pay the value-added tax;
- 16% – for entities and individual entrepreneurs in respect of donated (gratuitous) goods (works, services), property rights, monetary resources.

The calendar year is the taxable period for the STS regime.

Tax reporting period under the STS regime is as follows:

- calendar month – for entities applying STS and paying the VAT month;
- calendar quarter – for entities applying STS and not paying the VAT or paying the VAT on a quarterly basis.

A tax return shall be submitted on or before the 20th day of the month following the reporting period, which has ended. In the STS regime, taxes shall be paid on or before the 22nd day of the month following the reporting period, which has ended.
The Simplified Tax System is subject to restrictions in respect of particular business activities and specific classes of payers. Thus, the STS cannot be applied by the following entities:

- being a participant of a holding company;
- by commercial entities whose share of over 25 per cent of stock (25% participatory share) is owned by a single entity or jointly by several other entities;
- by commercial entities whose 25 per cent shares or stocks are owned (and even jointly) by the Republic of Belarus and/or its administrative-territorial unit(s) (cl. 5.6., 5.7, art. 286 TC).

C. Preferential tax regimes

Within the ‘special’ tax regimes, some categories of taxpayers may be granted privileges and preferences in taxation, including the profit tax. By reference to the initial purposes and the expected activities of the IT cluster, the Preferential Tax Regime granted to Hi-Tech Park (HTP) residents shall be considered.

The Hi-Tech Park offers a preferential tax regime granted by the Republic of Belarus to companies involved in activities in the information technology sphere. The legislation provides with a formal procedure of joining the HTP: an applicant shall prepare a package of required documents (as specified below) and present it to the HTP Administration, which will issue its opinion on the applicant’s conformity and will pass it to the Supervisory Board. After that, normally within a month following the official submission of the application, a decision will be made on registration or on refusal to register the applicant as HTP resident.

The mentioned above package of documents includes:

- application;
- copies of foundation documents and state registration certificate;
- business project to be implemented by the applicant as HTP resident.

The business project is the key factor for the decision on HTP residency. The business projects shall contain data on the applicant (legal entity) itself, its history and achievements, its strategic profile within the HTP, description of main products to be offered by it, and an analysis of prospective markets for their distribution. Also, the business project shall contain a plan of concrete activities to implement the goals stated by the project with an indication of their deadlines.

When preparing a business project, the HTP’s purposes of activities in whole shall be considered. These are:

- development and implementation of information/communication technologies and software in industrial and other entities of Belarus;
- export sales of information/communication technologies and software;
- other business areas as approved by the President of the Republic of Belarus.

Thus, it will be proofed that the IT cluster’s goals or its tools’ goals (subject to the incorporation form of the IT cluster) are related to any of the above mentioned HTP’s purposes, as you indeed should consider the variant of IT cluster’s (or its tools’) residency in the HTP in view of the privileges and preferences described below.

HTP residents use the following privileges and preferences:

- exemption from:
  - profit tax (except for profit tax paid by the taxpayer as tax agent);
  - VAT on sales turnover of goods (works, services, property rights);
  - VAT on importing process equipment, components and/or spare parts to such equipment in Belarus;
• land tax on land within HTP boundaries during the period of construction of designated permanent buildings/structures by HTP residents, however not longer than for three years;

• real estate tax in respect of HTP residents’ real estate units situated in the Hi-Tech Park territory (except for leased real estate);

• offshore duty, in paying (transferring) dividends to founders (participants).

• required insurance premiums are not accrued on the revenue of HTP resident’s employee exceeding the amount of the national average monthly salary;

• income of natural persons derived from the calendar year from HTP residents under labor agreements, and income of HTP residents which are individual entrepreneurs – are taxed for profit tax of 9 %;

• a decreased rate (5 %) for the income tax imposed on foreign entities not operating in Belarus via permanent establishments, in respect of income raised from HTP residents by way of dividends, income on debentures and royalty.

However, HTP residents shall pay contributions to HTP Administration in the amount of 1% of their revenue (income) gained in the previous quarter.

There is one more aspect of using the above privileges. To preserve their HTP resident status, residents shall carry out only those types of activities, which are defined by the current laws. These can be divided into three groups (this grouping is not official).

Core primary lines of business:

• analysis, design and software support for information systems;

• basic and applied research, exploratory development in natural and engineering sciences (scientific research, experimental designing, and development engineering relating to HTP lines of activities, including information society evolution) and implementation of findings of such research and development efforts;

• research and development or particular development stages (research, design engineering, testing, technical tests) in materials, technologies and techniques, micro-, opto-, nanoelectronics and microelectromechanics devices and systems, implementation of findings of such development projects, and implementation of materials, technologies and techniques, micro-, opto-, nanoelectronics and microelectromechanical devices and systems developed by the HTP resident, together with compatible embedded software;

• research and development or particular development project (research, design engineering, testing, technical tests) in technologies and techniques, devices and systems of mechatronics, embedded systems, soft hardware, hardware and software systems, computer equipment and components, implementation of findings of such development projects, and rendering services in their manufacturing application or without such services.

Core ancillary lines of business:

• consulting with organizations on commercial activities and management to increase efficiency; services in complex control of development and implementation of integrated information systems and technologies;

• execution of single work items (working stages) as the part of software (software environment) design process, support and routine maintenance of clients’ or own software (software environment);
• auditing of information systems and software during development, introduction, and operation for compliance with customers’ technical requirements and/or information needs under orders placed by legal entities and individual entrepreneurs of the Republic of Belarus.

For reference: it is important that HTP residents are entitled to carry out a line of business from this group only if the gross revenue (income) from such activity is not more than 50% of revenue (income) on the sales of goods (works, services, property rights) related to analysis, design and software support of information systems, raised from 1 January to 31 December of the preceding year.

Non-core permitted lines of business:

• leasing real estate (real estate units) owned by HTP resident and situated in the territory of the Hi-Tech Park;

For reference: this type of business may be carried out by an HTP resident only if the total amount of rent payment during a calendar year is not more than 10% of total revenue (income) raised by such HTP resident from 1 January to 31 December of the preceding year.

• extension of loans (out of profits) to employees for construction (reconstruction) or purchase of living quarters.

HTP residents are not entitled to carry out other types of activities. Violation of this restriction will result in cancellation of HTP residency and loss of rights to apply for any privileges and/or benefits, including already used for tax purposes. That is, immediately upon any violation of the business procedure, an HTP resident must pay profit tax and other GTR-related taxes to the state budget.

3.4.2. Taxation systems which may be used by the IT cluster and its tools in the variants of IT cluster business forms as outlined in section 3.1 of this Concept

Based on the suggested IT cluster business forms as outlined in section 3.1, the taxation systems, which may be used by the IT, cluster itself and by its tools are present below.

Option 1: Association

Figure 13: Association taxation scheme

Source: REVERA team analysis.

Association taxation

The framework of Option 1 considers that ‘association’ is the external form of the IT cluster. An ‘association’ is a legal entity – therefore it shall apply any tax system. Association may use the GTR or the STS. However,
if an association is going to carry out entrepreneurial activity, then it is necessary to establish a commercial entity for these purposes, it is also included in Option 1.

The choice of the tax system will depend on the balance of spending and incomes, and on the restrictions for STR application as specified in cl. 4.1 hereof. Regarding spending the following information shall be taken to make a choice:

- where expenses are at least 80% of the income of the Association, GTR shall be applied;
- where expenses are less than 80% of the income of the Association, STR shall be applied.

For reference: until 2017, an individual privilege was provided by p. 3 art. 142 TC for members of a ‘scientific research association’ created under the BSU, by this privilege, income from sales of information technologies and related development services was taxed with profit tax rate of 5%.

Considering that the BSU is also a member of the IT cluster, it is probable that this privilege might be reinstated, if an appropriate petition is lodged to the Ministry of Taxation of the Republic of Belarus.

LLC taxation

Also, within the framework of the IT cluster structure, as specified in Option 1, the Association will create, on its behalf or jointly with its members (BSU tools and IT companies), a limited liability company (LLC) to carry out commercial activities.

As more than 25% of such LLC’s authorized fund would be anyhow owned by a single entity (i.e., the Association) or by several entities jointly (the Association and IT companies), such LLC would not be entitled to apply STS. Thereby, such LLC created by the Association or jointly with the participants of the IT cluster may:

- apply GTR and pay income tax at the rate of 18% and VAT on sales;
- become an HTP resident and be exempt from profit tax and VAT on sales, and only transfer 1% of its revenues quarterly (for the preceding quarter).

The only instance where the Association’s subsidiary LLC would be entitled to make use STR – is where at least 75% of LLC participants be natural persons. However, such an option is not examined, as it lies beyond the overall concept for the IT cluster.

In the context of tax optimization, applying for HTP residency is the best variant for the LLC (to be founded by the Association, or jointly by the Association and the IT companies).

Taxation tools

Also, according to the concept of Option 1, the Association plans to create a laboratory in the form of an ‘institution,’ and an educational institution as well. Where such institutions would be engaged in any income activities, such activities will be considered as a subject to taxation. Such institutions may use either GTR or STR. As stated above, choosing among these systems shall be done after analysis of expenses related to the income activities of such institutions and of restrictions for STR application as specified in section 3.1 hereof. Regarding spending the following information shall be taken to make a choice:

- where expenses are at least 80% of income, GTR shall be applied;
- where expenses are less than 80% of income, STR shall be applied.

**Option 2: LLC-1**
Figure 14: Taxation scheme of managing company

Source: REVERA team analysis.

LLC taxation (managing entity)

According to the concept of Option 2, a central legal entity, a limited liability company (LLC, the managing entity) will be founded by the BSU facility and the IT companies. In such case, over 25% of such LLC’s authorized fund will be anyhow owned by a single or jointly by several entities. Due to this, under the tax laws, such LLC will not be entitled to use STS.

The only instance where the Association’s subsidiary LLC would be entitled to use STR – is where at least 75% of LLC participants be natural persons. However, such an option is not examined, as it lies beyond the overall concept for the IT cluster.

Thereby such LLC would be entitled to apply GTR only and will have to pay profit tax at the rate of 18% and VAT on sales.

Taxation of the commercial LLC created by the managing entity

Option 2 also considers that the LLC (managing entity) will create another LLC for commercial activities. As over 25% of such LLC’s authorized fund will be owned by the managing entity, such LLC will not be entitled to use STS. Due to this, such LLC created by the operating entity will be able to use:

- GTR and pay profit tax at the rate of 18% and VAT on sales;
- become an HTP resident and be exempt from profit tax and VAT on sales, and only transfer 1% of its revenues quarterly (for the preceding quarter).

The only instance where the Association’s subsidiary LLC would be entitled to use STR – is where at least 75% of LLC participants be natural persons. However, such option is not examined, as it lies beyond the overall concept for the IT cluster.

Based on the goals and activity of the LLC, created by the managing entity, we recommend that this LLC shall join the HTP, as in the context of taxation, joining the HTP is the best option of running an IT business in Belarus for any IT company.

Taxation of tools

Option 2 also presupposes that the managing entity will create a laboratory in the form of an ‘institution,’ and an educational institution, too. As was mentioned before, an ‘institution’ is an entity/organization created in order to exercise managing, social/cultural or other functions of a non-commercial nature and
funded, wholly or partially, by its founder. If an institution carries out any income activities, such activities are also considered as subject to taxation. Institutions may apply GTR or STR.

To choose among these taxation systems expenses related to the income activities of such institutions shall be analyzed:

- where expenses are at least 80% of income, CTS shall be applied;
- where expenses are less than 80% of income, STS shall be applied.

It should be noted that non-commercial entities assess their taxes by income from sales of goods (works, services) and/or property rights gained through business activities of institutions and on non-operational incomes net of the amount of non-operational expenses. When using CTS, institutions will have to maintain separate accounting of income from sales and expenses related to entrepreneurial activities. That is why the profit tax base will be diminished only by expenses related to the entrepreneurial activities of the institutions (not by all expenses related to the activities and operations of institutions in whole).

3.4.3. Analysis of IT cluster taxation in receiving dividends, sponsor support (grants), member fees.

**Dividends**

Dividends received by the IT cluster (by the LLC managing entity or by the Association) will be liable for the profit tax at the rate of 12%. The current laws do not provide any restrictions for commercial or non-commercial entities, which receive dividends. Accordingly:

Option 1: where the Association collects dividends from the LLC created by it, the Association will pay taxes at the rate of 12% of a number of dividends collected.

Option 2: where the managing entity (LLC) collects dividends from the LLC created by it, the managing entity will pay taxes at the rate of 12% of a number of dividends collected.

It should be also noted that in case of distribution of profits (dividends) realized by the managing entity (LLC) payable to the participants of such LLC (IT companies which are HTP residents), such participants (HTP residents) will not pay profit tax from such profits (dividends) as HTP residents are entirely exempt from profit tax.

**Sponsor support (grants)**

Taxation of the IT cluster (or its managing entity (LLC), or the Association) or their tool (institutions) which receives sponsor support (grants) will depend on the legal status of the receiver:

- where such support is received by a non-commercial entity (the Association, institutions, etc.), then the amounts of the sponsor support, received by non-commercial entities, will not be included in the sum of non-operational incomes, provided however that the received sponsor support has been used for designated purposes, which stipulated in constituent document;
- where such support is received by a commercial entity (for instance, the managing entity), then such amounts of sponsor support will be acknowledged as ‘non-operational incomes’ and will be included in the tax base for the profit tax or the STS tax base correspondingly.

**Membership fees**

Membership fees to be contributed by the members of non-commercial entities (the Association, institutions) are not acknowledged as ‘non-operational incomes’ and are not subject to taxation (including in STS as tax base) if:

- such non-commercial entity receives such membership fees in the amount as prescribed by the charter. However, if the membership fee exceeds the rate prescribed by the charter, then, to avoid the incurrence of non-operational incomes and imposition of profit tax on such difference, we recommend to transfer such amounts to sponsor support;
• money has been received from participants as part of the funding of non-commercial entity’s activities. The oncoming funding may be raised as special-purpose contributions for any Association’s projects within the framework of its statutory activities. Size, procedure and time frames for making such contributions may be established by the charter of the non-commercial entity. However, considering that the legislation does not contain any specification for the purposes of the oncoming funding, we recommend directing an inquiry to the tax authorities for a clarification of the term “oncoming funding of a non-commercial entity” and the target purpose of such funding.

Furthermore, sums of voluntary contributions to support associations (unions) made by payers are not included into expenses cumulated for profit tax assessment. Accordingly, sums of membership fees paid to BSU and IT companies, as IT cluster participants will not decrease their profit tax base.

3.5. Legal aspects of utilization of intellectual property objects created in the course of IT cluster’s activities

3.5.1. Commercialization of intellectual property objects created in the course of IT cluster’s activities

For the purposes of this Concept, ‘commercialization’ means the following:

• deriving of profit on IT cluster’s activities and/or co-operation of IT cluster members;
• "Monetization" of intellectual property objects created within the IT cluster.

Proceeding from the options of IT cluster is organizational, legal structure, utilization of newly created intellectual property objects may be carried out by:

• non-profit organization – the Association;
• commercial organization – the LLC.

Nevertheless, it has to be taken into account that non-profit organizations are subject to restrictions on commercialization, as it implies involvement in ‘commercial activities.’

The Association itself is not entitled to carry out entrepreneurial activities. The Association can engage in entrepreneurial activities only by means of creation of commercial organizations and (or) participation in them.

Commercial organizations are not subject to restrictions on legitimate activities with which they can gain income, i.e., there are no hindrances for commercialization of newly created intellectual property objects.

Based on the above, our recommendation is to use a commercial organization to profit from the commercialization of newly created products.

The following main methods of commercialization within the framework of IT cluster’s activities can be distinguished:

• participation in tenders involving creation/implementation of IT projects, intellectual property objects;
• development of intellectual property objects by the IT cluster / IT cluster members, under orders from non-state actors;
• Monetization of finished intellectual property objects (newly created or purchased by the IT cluster / IT cluster members).

Furthermore, in terms of tender bidding, the following types of public procurements can be distinguished:

• publicly-funded tender;
• tender financed from private funds.
Tenders implying financing from public funds normally feature stricter rules of the election of winners, stricter payment procedures and requirements for special documentation. Also, where any intellectual property objects are created at the expense of government funding, exclusive rights to objects created under such tender must be transferred to the state, i.e. if financing is carried out by the state, then all rights on the outcomes of such activities will be transferred to the state. It is unlikely that the IT cluster will reserve its right in such a situation and will be able to monetize the newly created intellectual property objects in the future.

Entities that can commercialize are:

- LLC specially established for implementation of business activities;
- separate IT company that is a member of the IT cluster;
- several IT companies that are members of the IT cluster;
- specially established LLC and IT company that are members of the IT cluster.

In the latter two variants, the interaction of the IT cluster members with each other and/or with a specially established LLC is important.

In legal terms, all of the above options are correct.

The choice of an option will depend on the chosen business model. Therefore, it is necessary to consider the following factors:

- the variant of commercialization via a specially established LLC for business activity controlled by the Association is simple in terms of administration – in this case the Association has many direct mechanisms to control projects and its profitability. In this situation the synergy effect can be used – you can combine the resources of several IT cluster members based on the LLC controlled by the Association. However, the disadvantage is that such an LLC would hardly have a permanent staff fitting for all commercial projects. So, depending on the business decision on the creation of a product or participation in a tender, it will be necessary to staff the LLC with employees based on the required project profile (healthcare, logistics, etc.), and in particular to engage employees of IT companies (IT cluster members), for example, via dual job holding.

- commercialization via a separate IT company being an IT cluster member, will be suitable for participation in government procurements, when the applicant's "reputation" and "seniority" can significantly raise the chances of winning the tender; however, this variant’s disadvantage is that the Association will not be able to directly participate in profits from such activities. Thus, in this variant, profits from the tender will be earned by a particular member of the IT cluster and the project’s profitability to a large extent will depend on such member. Accordingly, the Association can receive some "profit" from the project only indirectly through membership fees from such a company (member of the Association). In this case, it is advisable that the Association's charter provide for higher membership fees, for example, as a percentage of the earned profits;

- if commercialization is carried out via several IT companies (including the participation of a specially established LLC) being members of the IT cluster, it will be necessary to conclude agreements between IT cluster businesses that participate in such commercialization. Disadvantages of this method are: it will be needed to administer the interaction processes between the companies, creation of tax obligations related to conclusion and fulfillment of such contracts. In other words, the more complicated the business structure is, the more difficult it will be to work out the concept for its existence and activities. Again, in this variant the Association does not directly participate in drawing profits and its potential to impact the amount of such profit is either indirect (if the Association’s LLC is involved in the project) or does not exist at all (if the Association’s LLC is not involved in the project at all). The main material benefit for the Association in this variant is to collect increased membership fees. The advantage of this variant is that several members of the IT cluster can benefit from the synergy of their resources.
Such internal interaction of companies within the IT cluster can be mediated through the following forms:

- the conclusion of a joint operation agreement between IT cluster members, i.e., establishment of a simple partnership where roles of each IT cluster member will be distributed within the framework of specific project;
- the conclusion of various commercial contracts between IT cluster members participating in the project.

Establishment of a simple partnership has its advantages and disadvantages:

<table>
<thead>
<tr>
<th>Benefits of the simple partnership</th>
<th>Disadvantages of the simple partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td>No new legal entity has to be created (the plus is that you do not have to spend resources on its incorporation, maintenance, etc.)</td>
<td>A simple partnership is a separate taxation unit, i.e., its profits will be taxed separately</td>
</tr>
<tr>
<td>Contributions made by members of a simple partnership may be non-monetary and non-property contributions. Copartner’s contribution, for example, can be business connections, mentoring experience, etc.</td>
<td>Since a simple partnership is not a legal entity, it cannot participate in public procurements on behalf of itself;</td>
</tr>
<tr>
<td>The possibility to conclude an agreement where the roles of all project participants will be distributed (those who administer, who promotes, who creates the product, etc.)</td>
<td>Members of a simple partnership cannot apply for preferential tax treatment, in particular, for the simplified tax system.</td>
</tr>
</tbody>
</table>

Source: REVERA team analysis.

The conclusion of a joint operation agreement (i.e., the establishment of a simple partnership) does not supersede the existence of the Association. Establishment of the Association has its purpose, different from that of the conclusion of the joint operation agreement. The joint operation agreement just enables you to settle and mediate relationships of companies that are IT cluster members for the implementation of projects: who performs which roles, how the profits are shared by the results of the projects, etc. However, a new legal entity is not created, but a new "unit" for taxation arises. This is a variant of commercialization of projects using the synergy of resources of several companies – IT cluster members.

As for coordination of IT cluster members through separate agreements, the following variants of agreements are possible:

- the conclusion of a project administration services contract and/or a project marketing promotion contract between IT cluster members which would imply future offsetting of requirements to other IT cluster members;
- the conclusion of license agreements within a group of IT cluster members which would grant rights to products needed for development activities;
• the conclusion of independent-work and sub-contract development agreements, depending on the potential and the competence of personnel of a particular IT cluster member for a particular project.

As for the second method of commercialization, that is monetization of finished intellectual property objects (newly created or purchased by the IT cluster / IT cluster members), the following variants of contracts are possible:

• grant of rights to newly created objects to third parties, under a license agreement in the B2B or B2C format;
• assignment of exclusive rights to newly created objects;
• implementation of newly created objects on material media;
• providing technical support for users and maintenance of newly created objects.

Grant of rights to newly created objects under of a license agreement is reasonable, when a newly created intellectual property object can potentially have many users and when there are sufficiently technical, administrative and human resources to carry out sales, promotion, and maintenance of the released product. Also, it is possible that sales and promotion will be handled by a reseller – a person who has obtained an appropriate license to distribute the product.

Assignment of exclusive rights to newly created objects is justified from the standpoint of the business logic, if the new software is unique and can be used by only one user, for whom it was created, and also in case it is more economically justifiable to transfer the new objects to another entity than to implement and maintain them independently.

Implementation of created objects on material media is a version of a license contract. It is justified if the conversion from sales on material media is higher than implementation via the Internet.

In this context, it is necessary to consider that according to the practice of application of the Decree of the President of the Republic of Belarus "On the Hi-Tech Park" (hereinafter – the “HTP Decree”), HTP residents cannot profit from implementation of their developments on material media, in other words, they cannot sell copies of newly created intellectual property objects recorded on compact-disks (CD, DVD) or USB-flash drives. Please be aware of this, since it is planned to engage HTP residents in the activities of the IT cluster. The position of the HTP Administration on this issue may change in the future.

3.5.2. Formalization of rights to the intellectual property objects created in the course of IT cluster’s activities

The question of ownership of rights to newly created intellectual property has a practical value for the described operating model of the IT cluster and activities of the Association because it can serve as a tool for the commercialization of IT cluster’s activities.

Methods of commercialization can be broadly classified into two types:

• “direct” ways of commercialization, through an LLC specially established by the Association;
• Commercialization through IT cluster members.

“Direct” ways of commercialization through an LLC specially established by the Association include:

• participation of the LLC in tenders for software development;
• Commercialization of developed (or purchased) products.

In case of participation in tenders, the ownership of rights to the intellectual property objects created under a tender task will be determined by the terms of such tender. Most frequently, tender conditions stipulate that all rights to newly created objects shall be passed to the orderer under the tender. This also applies to tenders, where financing is carried out of government funds.
To commercialize developed (or purchased) products, all rights to the product must belong to the LLC established by the Association. This explains why such rights shall be ‘accumulated’ within the LLC.

The LLC may develop software either by efforts of its employees working in-house under labor contracts (either full-time or part-time) or by efforts of outsourcing developers (individuals or legal entities) under civil law contracts.

To have the rights transferred to the LLC, you need to take the following steps:

*for an employment contract:*
- the employment contract and/or job description shall specify that development of intellectual property is part of the employee's labor duties
- tasks for development of particular objects of intellectual property must be assigned to employees and/or employees must sign reports on the establishment of works-for-hire

*for a civil law contract:*
- development contracts (regardless of who is the developer: an individual, an entrepreneur, a legal entity) must contain provisions on the transfer of rights to the orderer.
- the subject of development must be precisely defined in the contract.

As for commercialization through IT cluster members, this method is not so convenient regarding Association’s interests, as commercialization through the specially established LLC. This is because the Association cannot participate in the profits of the IT cluster. Association can get economic benefit only from contributions by IT cluster member.

An IT cluster member has the same variants for commercialization as the specially established LLC. In this regard, our recommendations for an IT cluster member regarding the rights to newly created intellectual property objects are similar, as for the specially established LLC.

If other participants were involved in the process of commercialization through one IT cluster member, the transfer of rights to newly created intellectual property objects as a result of such synergy might be effected by various contracts. The composition of such contracts will be selected by the development processes and the logic of the related business processes.

For the BSU educational program (considering BSU is a partner under the projects and the Association member), to bond the rights to intellectual property objects created by students with the BSU, we can propose the following model of actions:

*in the chain “BSU – master student”:*
- the contract for educational services should include the student’s obligation to create intellectual property objects during his/her training and a clause on the transfer of rights to such newly created objects to the BSU;
- when enrolling on a master course, students will prepare and sign a Software Disclosure Letter (a statement about: (1) what has been previously created by the student, (2) the objects to which the student has respective rights, so that there would be no confusion as to whether the student or BSU has the right to this or that object);
- for the transfer of rights to BSU, it will be essential to give students technical (educational) assignments and to sign progress reports further – this will determine the subject of the transferred rights. If it is not determined, to prove the transfer of rights might be difficult.

About traineeships in IT cluster member companies, it would be rational to transfer rights to the company paying for the training.

So, we recommend that a clause is included in the contract on the fee-based training of a specialist (manual worker, salary worker) stipulating that the student is obliged to create intellectual property objects during
the educational course and that rights to such newly created objects shall be transferred to the company paying for the training.

_in the chain "master student – scientific, practical center / scientific laboratory":_

- in the physical infrastructure access contract, it is essential to point out that rights to any intellectual property created by the physical infrastructure of such scientific center/laboratory and any intellectual property objects created during the training course will be transferred to the scientific center/laboratory;
- in order to have the rights transferred, it will be necessary to give students technical (educational) assignments and to sign the progress reports further – this will define the subject of the rights to be transferred. If it is not determined, to prove the transfer of rights might be difficult.

_in the chain "master student – practical training in an IT cluster member":_

- the educational services contract must contain a clause stipulating that any and all rights, except for rights to objects created during the traineeship, will belong to the company that has organized the traineeship for the students;
- the agreement between the educational institution and the IT cluster member on the traineeship must contain a clause stipulating that the rights to all objects created by the student during the traineeship will belong to the IT cluster member that has admitted the student to the traineeship program;
- an additional option (we recommend to use it as well) – based on the results of the traineeship, to execute a fee-based agreement of assignment of exclusive rights;
- if a fee-based agreement of assignment of exclusive rights is not executed, we recommend that IT companies have trainees draw up reports on their creation of intellectual property objects to specify those objects, the rights to which are transferred to the company.

4. Scholarship fund

4.1. General aspects of the scholarship fund organizational model

The key issue of the master’s program success is to attract students and working professionals as listeners of this program.

To attract listeners, the master’s program should focus on two main features:

- **the quality of the program** - the relevance of the disciplines, as well as the quality and reputation of the lecturers of the disciplines;
- **the availability of the program** – the compliance of the program cost with the financial opportunities of potential listeners.

Program quality issue can be solved through cooperation with real sector companies and the public sector, which will be interested in forming a pool of disciplines and practical skills necessary for the successful implementation of specific projects (for which the cluster is founded).

Available master’s program of high quality will encourage the listeners to obtain new knowledge and graduate specialists in high demand.

Also, the cost of the program should correlate with the growing value of the graduate in the labor market after the end of the program. In other words, the qualification of the graduate of the program should allow him to earn considerably more after receiving a master’s degree than before.

The issue of program availability is closely related to the program quality. The primary criterion for the quality of the curriculum is the availability of lecturers from the real sector. However, the salary in the real sector is 20 times higher than the salary of the professors and lecturers.
To attract teachers from the real sector, a comparable level of income should be provided. To ensure a proper level of income, the cost of the program should be high enough.

At the same time, if the cost of the program is too high, there is a risk that it will not be possible to gather enough students to launch the master's program.

Figure 15: Possible scenarios for an inflated and undervalued program cost

Source: Civitta team analysis.

Thus, the cost of master’s program and payment options are crucial to the success of the master’s program. We identified two approaches to paying for tuition:

- payment by students at their own expense;
- partial or complete financing of tuition from external sources.

Based on the survey data, the cost of a pilot launch is high compared to market expectations.

Figure 16: The cost of one year of master's program, EUR

Source: Civitta team analysis.

Moreover, the tuition is higher than the average cost of obtaining one year of higher education in universities and other master’s programs.
For this reason, the likelihood that students will individually pay for their tuition is quite small. This probability decreases even more, given the fact that talented employees in IT companies promote very quickly - their position and wage level can be higher due to the accumulation of experience in the workplace than for the acquisition of new knowledge.

It leads to a lower motivation for paying for master’s tuition, which can be increased by easier access to education.

It is important to determine the limits of these mutual obligations in the following aspects:

- Cooperation on a voluntary basis:
  - a specialist after graduating from a master's degree has the opportunity to receive a job offer;
  - after receiving such a proposal, the specialist has the opportunity both to accept it and to refuse (in case of refusal, the specialist must reimburse the costs of training).

- Limited work repayment:
  - the specialist (if he accepts a job offer) is obliged to work for the benefit of someone who paid for his tuition for a particular limited time.

- Specialist’s salary:
  - the company or institution that pays for the tuition should provide the specialist (if he/she accepts a job offer) a certain level of salary, as a rule, not lower than the market average at the time of employment.

Based on the information above, it will be optimal to receive an external source of scholarship fund formation.

There are several options for financing master’s program at the expense of external sources:

- Part of the tuition fee is paid by private sector companies that participate in the implementation of BSU ICT cluster projects on individual tripartite agreements with listeners. This method is used in the pilot launch of the master’s program in 2017. Softline Group pays up to 50% of the tuition fee. The company reserves the right to hire the graduate after program completion.
  - if he refuses, then reimburses the funds paid by the Softline Group;
• if the graduate is not hired after the completion of the master’s program, the graduate does not reimburse and finds a job on his own.

• Private companies can jointly form a scholarship fund, which can be used to pay for tuition. The creation of a scholarship fund can be realized in two ways:
  • within the frame of Association by formalizing the relations between its members;
  • by creating a separate legal entity in the form of a fund.

A preferable option for creating a scholarship fund as a way to finance the master’s course may be realized by creating a scholarship fund within the frame of the Association, as follows:

At the general meeting of Association members, a decision is taken (formalized by the protocol) on the creation of a scholarship fund, i.e., of a separate account (sub account) in the Association’s accounting records, where Association members’ special-purpose contributions will be accumulated to finance training under the master’s course. The protocol will also provide the following conditions:

A. A differentiated approach to the payment of special-purpose contributions by Association members:
  • target contributions will be paid only by a member interested in the master students who will be involved in a certain line of activity;
  • All Association members will pay target contributions, but those members wishing to provide work assignments for graduates will pay such fee in a larger amount.

B. The right to assign master graduates to an IT company (an Association member) will depend on the fact of contribution and the size of the special-purpose contribution.

C. Disposition of assets accumulated in the scholarship fund (on a certain Association’s account) will be restricted only to transfers of money to the BSU within the frame of financing of the educational program.

• The system of governmental grants. In any case, the reimbursing principle of tuition fee must be adhered to. This means that the listener should be assigned to work in the organization, which paid his tuition fee. And it does not matter what the given organization is - a private company, a state company or government bodies.

Each of the funding sources has its advantages and disadvantages:

<table>
<thead>
<tr>
<th>Table 11: Advantages and disadvantages of various sources of funding</th>
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</thead>
<tbody>
<tr>
<td>Payment for tuition at the expense of the students' funds</td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
</tr>
<tr>
<td>● Listeners are free to choose their workplace and to apply the acquired knowledge and skills</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Payment for tuition at the expense of the students' funds</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Companies are guaranteed to receive new employees.</td>
</tr>
</tbody>
</table>

**Disadvantages**

- Due to the relatively high cost of the master's program, the number of listeners may be small.
- Difficulties in recruiting enough listeners to form a group at the expense of individual agreements.
- Problems in graduates' assignments to the scholarship fund companies.
- Creating a special fund to finance the students of the master's program takes time to coordinate and allocate funds from the budget.

*Source: Civitta team analysis.*

Thus, each of the ways of financing the studying in the Master's program has its advantages and disadvantages. Nevertheless, it is worth using all possible ways because using one of the methods for any of the listeners does not cancel the use of another method for another listener.

Obviously, the greatest potential for attracting listeners is the use of external sources of funding. The simplest way to use external sources is a scholarship fund, formed by companies interested in obtaining qualified specialists.

The disadvantage of this method is the lack of a clear understanding of where exactly the specialist will work after graduation.

This problem can be solved in the following ways:

- The number of specialists to hire a particular company depends on its share of contributions to the scholarship fund. For example, the first company's contributions accounted for 50% of the total amount of the scholarship fund, the second company's contribution was 30%, and the third - 20%. The scholarship fund paid for ten students' tuitions. As a result, the first company has the right to choose five graduates; the second company has the right to choose three graduates, and the third company - two graduates.
- The right of the first choice belongs to the company whose share of contributions is higher. In the above example, the first company selects the first graduate; the second graduate is selected by the second company, the third – by the third company, then the first company chooses again and so on.

The legislation provides for an approximate form of such an agreement, which specifies the obligation of the basic organization (in our case - the IT cluster) to employ graduates. We believe that the approximate form in this part can be changed by providing that the association can ensure employment of graduates both in the IT cluster and in one of the members of the IT cluster at its discretion. The possibility of including such a condition in a contract with BSU is determined by the following:

- The established form in the legislation is approximate, i.e. can be changed;
- The approximate form includes "Additional conditions of the contract," which also indicates the possibility of implementation of such special conditions into the contract with BSU.
4.2. Legislation aspects of relations of the IT cluster (its participants) and master students enrolled in the practice-oriented master course

Relations between the IT cluster (its participants) and master students include the following components.

A. Payment for the 2nd degree (master course) of higher education by master students

The master course will be fee-based. Payment of fees may be performed wholly or partially by the IT cluster, its subsidiary LLC, or particular IT companies participating in the IT cluster. The rest of fees (if any) will be paid by master students.

It is implied that if a master student is employed by the company which provided funding for his/her studies, such graduate will not reimburse his/her tuition fees. Also, tuition fees will not be reimbursed if the financing company is not offering a work position to a graduate. The fees must only be reimbursed by a graduate to the financing company if such financing company offered a work position to such graduate, but he/she declined.

These relations with master students may be formalized in the following ways:

- **agreement on fee-based training of a specialist (art. 64 of the Education Code)** This agreement may be trilateral: between the IT cluster’s subsidiary LLC (or the IT cluster itself or a particular IT company), the BSU and the master student. The organization providing funding may pay tuition fees under such agreement either wholly or partially. A model form of such agreement has been approved by Resolution No. 99.

  Such agreement may stipulate the above terms of reimbursement by master students of tuition fees paid by the financing organization (cl. 9 of the model agreement provides for additional arrangements of the parties).

- **loan agreement between the financing organization and the master student**

  Such agreement may stipulate that monetary resources will be remitted by the financing organization directly to the BSU to secure the master student’s obligations to pay tuition fees according to the agreement between the master student and the BSU. Such agreement shall specify the relations regarding repayment of such loan (if the master graduate declines work proposal from the IT company) or future salary deductions, or waiver of debt if the IT company does not propose work position to such master graduate.

  Essentially, the two above methods of formalization of financing the fee-based master courses do not have any significant discrepancies. The most rational way to finance the fee-based master courses would be to make use of agreement on fee-based training of a specialist, as it is a compact type of agreement especially designed for such purposes (implies execution of one document only).

  In the case of financing under a loan agreement, it is necessary to execute two documents:

  - a bilateral agreement (between a master student and the BSU) on the fee-based master training;
  - a loan agreement.

- **creation of the scholarship fund.**

  Financing of master’s studies may be effected using creating a "scholarship fund" formed jointly by IT companies. The creation of a scholarship fund can be realized in two ways:

  - within the frame of Association by formalizing the relations between its members (this option is more detailed above in section 3.1).
  - by creating a separate legal entity in the form of a fund (the specifics of the creation of funds are specified above in section 3.1).
Execution of a funding agreement with a master student.

It can be a trilateral agreement (between the BSU, the master student, and the Association) for specialist training on a paid basis or a loan agreement between the Association and a master student (as described above in detail herein).

Execution of an agreement on the interaction between the Association and the BSU (optional).

This step is optional and can be realized at a later stage of the Concept’s implementation as a form of the closest cooperation between the BSU and the IT cluster. A detailed description of this cooperation form is given in section 3.2.2 hereof.

B. Master students’ practical training in IT companies (IT cluster members), or in the IT cluster’s subsidiary LLC

Procedures for practical training and its formalization have been determined by Resolution of the Council of Ministers of the Republic of Belarus No. 860 dated 3 July 2010 "On approval of the Regulations on practical training of students, cadets, and trainees."

In order to organize practical training, an agreement on practical training must be executed between the BSU and the IT company or the IT cluster’s subsidiary LLC. The form of such an agreement is not defined by legislation and shall be developed by the BSU independently.

During their practical training, students will work on actual projects conducted by IT companies and the IT cluster’s subsidiary LLC.

C. Employment of master students by IT companies – IT cluster members

Relations may be formalized as follows:

- a commercial contract between the IT company and the master student
  This should be a mixed Contractor’s Agreement and IP-Rights Assignment Agreement to the results of the intellectual activity.

- an employment agreement between the IT company and the master student.

Employment of master students will be performed by arrangement with the IT company or the IT cluster’s subsidiary LLC. At the same time, contractual provisions of agreements on funding of studies of corresponding master students shall be considered.
5. Financial model of ICT cluster

5.1. Sources of IT-cluster income

Based on the proposed options for the structure of the cluster, two main income types can be identified (according to their source):

- **external income** – income, received from individuals/organizations that do not participate in the cluster. It is assumed that the primary source of the external revenue of the cluster will be the income received by LLC, established by the Association for the performance of commercial functions;
- **internal income** – income that one of the participants in the cluster receives from another participant in the cluster.

**Income of the Association**

Association as a non-profit organization will not carry out any commercial activity. Accordingly, the only income source for the Association will be the internal revenue in the form of dividends, which the Association will be able to receive from the established LLC.

The existence and the rate of dividends that the Association will receive will directly depend on the effectiveness of the LLC activities. The main uses of the received income will be funding educational and research activities (development of the master’s program and laboratories). Also, the operational (administrative) activity of the Association will be financed with the received dividends.

**Income of the LLC**

IT-cluster will receive only external income. As part of its activities, LLC will implement projects in the field of informatization (more specifically, potential activities are described in Section 2.3). LLC will subcontract IT-companies of the cluster, as well as involve other IT-companies of the Belarusian market if necessary.

On average, the IT-cluster will be able to implement 3-5 projects simultaneously per year. At the initial stage, it is planned to implement 1-2 projects per year and then gradually adopt of conducting four projects simultaneously. If the cluster is created in 2017 - the first half of 2018, LLC will be able to start the first project in 2018 and by 2020 to manage four projects at the same time.

The average duration of projects in the sphere of informatization is 2-3 years, with a mean cost of projects of $ 3-4 million. About 60% of the total cost of IT-cluster projects will be received as the work advances. When the projects become implemented, the remaining 40% will be received.

When the projects are completed, it will be necessary to support the developed solutions on an ongoing basis. It will become an additional source of revenue for LLC of the cluster. On average, 5% of the cost of the project is spent on a support such solutions per year.

Thus, in 2021-2027, LLC will be able to generate revenue of 4.3-7.5 million USD. More detailed information on the volume and dynamics of the potential income of LLC is listed in the table below:

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average cost of a project</td>
<td>mn USD/</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
<td>3,50</td>
</tr>
<tr>
<td>Duration of a project</td>
<td>years</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Average cost of support the</td>
<td>mn USD/</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
<td>0,18</td>
</tr>
<tr>
<td>developed solution</td>
<td>year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Indicators of IT-companies of the cluster

Within the framework of the proposed structure of the IT cluster, IT companies will receive only internal revenues (the usual activity of IT-companies outside the cluster is independent and does not apply to the cluster’s activity; accordingly, it is not considered in the financial model of the cluster).

Hence, all works on projects of LLC will be performed by subcontracting companies. It is assumed that 95% of all the revenue will be paid for the work of subcontractors.

IT-companies will be able to receive from two to seven mn USD of revenue from the implementation of projects within the cluster in 2020-2027 (Assuming that the projects will be implemented by the assumptions described above in the section "Income of LLC").

Table 14: Income flows of IT-companies

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (implementing projects)</td>
<td>mn. USD</td>
<td>0</td>
<td>0,56</td>
<td>1,22</td>
<td>2,27</td>
<td>3,99</td>
<td>4,38</td>
<td>5,60</td>
<td>4,38</td>
<td>5,60</td>
<td>4,38</td>
<td>5,60</td>
</tr>
<tr>
<td>Income (support of developed solutions)</td>
<td>mn. USD</td>
<td>0</td>
<td>0,00</td>
<td>0,00</td>
<td>0,14</td>
<td>0,31</td>
<td>0,57</td>
<td>0,80</td>
<td>1,07</td>
<td>1,30</td>
<td>1,57</td>
<td></td>
</tr>
<tr>
<td>Total income of IT-companies</td>
<td>mn. USD</td>
<td>0,00</td>
<td>0,56</td>
<td>1,22</td>
<td>2,27</td>
<td>4,13</td>
<td>4,68</td>
<td>6,17</td>
<td>5,18</td>
<td>6,67</td>
<td>5,68</td>
<td>7,16</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

Income of the University

As part of the cluster, the University will receive internal revenues from the Association and IT-companies (the primary activity of the University outside the cluster is independent and does not apply to the cluster’s activity; accordingly, it is not considered in the financial model of the cluster).

Two main types of income can be identified:

- income from the teaching students in the master’s program;
- targeted funds for the development of laboratories, scientific and research activities.

The admission is planned to include 20-25 people per year that correspond to the average size of the master’s groups. At the same time, it will close the potential demand for specialists of this profile and is the most effective amount from a financial point of view.

Duration of the master program will be two years (a standard term of master programs. It is also planned that the average tuition will be 2,900 USD per year for a person. In a more detailed way, the explicable and effectiveness of the proposed cost of the program were outlined in section 4.1 “General Issues of the Organizational Model of the Scholarship Fund.”
The Fund as a component of the Association will finance the education of 80% of the total number of students. It is assumed that 4-5 people (remaining 20%) will be able to study in this master's program at the expense of state and university grants, IT-companies that are not members of the Association, or on their account.

The Fund will also finance the development of laboratories and research activities. The average amount of investment is expected to be at the level of 1-1.5 th USD per month and will be spent on acquisition/development of necessary software, infrastructure development.

Therefore, the total income of the University will be about 163 thousand dollars a year. At the same time, the University's income from the master's program will amount to 145 th USD annually, of which the Fund will finance 116 th USD. Targeted funds for the development of laboratories and scientific research will be for 18 000 USD per year. More detailed information about the volume and flows of the University's revenues within the cluster is given in the table below.

<table>
<thead>
<tr>
<th>Table 15: Income flows of the university</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators</td>
</tr>
<tr>
<td>The number of students pers.</td>
</tr>
<tr>
<td>Which includes financed by the Fund %</td>
</tr>
<tr>
<td>Tuition per a person USD/year</td>
</tr>
<tr>
<td>Duration of education years</td>
</tr>
<tr>
<td>Volume of financing of master program mn. USD/year</td>
</tr>
<tr>
<td>Which includes the volume of the Fund mn. USD/year</td>
</tr>
<tr>
<td>Volume of financing of laboratories mn. USD/year</td>
</tr>
<tr>
<td>Which includes the volume of the Fund mn. USD/year</td>
</tr>
<tr>
<td>Total income of the university mn. USD/year</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

5.2. Prime expenses of the cluster

**Expenses of the Association**

Expenses of the Association will consist of two fundamental blocks:

- expenses for financing the master program, laboratory and research activities of the University;
- expenses for the administrative issues of the Association.

Expenses of the Association for the financing of the master's program, laboratory and research activities of the University was considered in detail in the section "Incomes of the University of IT Cluster."

Administrative expenses will include several cost items.

**Staff expenses**

For the proper functioning of the Association, it will be necessary to hire the Director (Head of the Association) and the Accountant.
The Director of the Association will perform all managerial functions, coordinating all the activities of the Association, maintaining relationships with other participants of the cluster, and representative functions. It is necessary to employ a highly qualified specialist with significant experience in the industry to the position of the Head of the Association, at the same time it implies a high level of payment for this position. Accordingly, the salary of this specialist will be 2-2.5 th USD per a month, which corresponds to the market level of relevant wages.

The position of the Accountant does not require significant skills because the Association does not conduct any commercial activity, which significantly reduces the volume of accounting work. The most optimal option is to combine the positions of the Accountant within the Association and LLC. In this case, the salary of such a specialist may be nearly 1 thousand USD per a month, which will correspond to average market level, and the cost distribution between the Association and LLC can be fixed at the level of 15% and 85%.

This distribution is attributed to more financial than logical issues. Being a non-profit organization and not receiving any income (except for dividends), the Association will not pay income tax. LLC will either apply general tax regime and pay profit tax or a preferential tax regime for HTP. In the case of the first option, a larger operating expense will reduce the sum of the profit tax. Otherwise, it will be possible for LLC to pay lower taxes on employee salaries. It is described in section 3.4 “Taxation of the cluster” that the Association will apply general tax regime, and that is why to pay standard taxes on salary: income tax in the sum of 13% and tax to the pension fund in the sum of 1%, 34% of social insurance contribution and 0.6% – contribution to Belarusian insurance fund.

In addition to salaries, expenses for trips and meetings of the Head of the Association are planned as part of staff costs. This expense is scheduled at the cost of 200 USD per a month, which will allow the Head of the Association to hold 8-10 meetings per a month with potential clients of LLC, representatives of the government, potential members of the Association, or carry out one foreign business trip.

<table>
<thead>
<tr>
<th>Staff expenses</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary Director</td>
<td>th. USD/month</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
<td>2,50</td>
</tr>
<tr>
<td>Accountant</td>
<td>th. USD/month</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
<td>0,15</td>
</tr>
<tr>
<td>The number of labor months</td>
<td>#</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Director</td>
<td>#</td>
<td>0</td>
<td>9</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Accountant</td>
<td>#</td>
<td>0</td>
<td>9</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Total staff expenses</td>
<td>th. USD/year</td>
<td>0,00</td>
<td>23,85</td>
<td>31,80</td>
<td>31,80</td>
<td>31,80</td>
<td>31,80</td>
<td>31,80</td>
<td>31,80</td>
<td>31,80</td>
<td>31,80</td>
<td></td>
</tr>
<tr>
<td>Employee travel and representation expenses</td>
<td>th. USD/month</td>
<td>0,2</td>
<td>0,2</td>
<td>0,2</td>
<td>0,2</td>
<td>0,2</td>
<td>0,2</td>
<td>0,2</td>
<td>0,2</td>
<td>0,2</td>
<td>0,2</td>
<td></td>
</tr>
<tr>
<td>Total employee travel and representation expenses</td>
<td>th. USD/month</td>
<td>0,00</td>
<td>1,80</td>
<td>2,40</td>
<td>2,40</td>
<td>2,40</td>
<td>2,40</td>
<td>2,40</td>
<td>2,40</td>
<td>2,40</td>
<td>2,40</td>
<td></td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

Office expenses

For representative purposes (for meetings and negotiations), as well as for the usual activities of the Association, it will be necessary to rent the office space. As there is a small number of employees, it will be enough to rent an office up to 20 square meters.
It also can be considered the option of renting an office together with LLC, but in this case, it will be the office of a larger area (about 40 sq. M.). The logical distribution of costs, in this case, is a distribution of 50% and 50%, which is assumed at the moment. In the future, it will be possible to reconsider this distribution based on the goals of reducing tax expenses. If LLC apply the general tax regime and it is possible to rent a common office, it will be more efficient to transfer the rent costs to LLC and thereby reduce the taxable profit.

Average the office rental rates in respectable centers with a good location (which is important regarding the implementation of representation functions) are 15-17 USD per square meter without VAT with additional utility costs of 1-2 USD per square meter.

In addition to rent of the office, the Association will also bear the costs of holding meetings of members and other similar events. At the initial stage of the Association's work, the number of these meetings will be 1-2 meetings per a month. In the future, it will be sufficient to hold one meeting of the Association members per a month. The average cost of these meetings can be estimated at 400-500 USD (rent, handouts, office equipment, water and drinks, other organizational expenses).

Also, as a component of office expenses, communications, office, and office equipment costs are planned in the sum of $ 100 per a month.

### Table 17: Flows of office expenses of the Association

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rented area sq. m</td>
<td></td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Cost per a sq. m. USD/month</td>
<td></td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
</tr>
<tr>
<td>The number of labor months</td>
<td></td>
<td>0</td>
<td>9</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Rental cost th. USD/year</td>
<td></td>
<td>0,00</td>
<td>2,70</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
</tr>
<tr>
<td>Utility costs per 1 sq. m. USD/month</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
</tr>
<tr>
<td>Utility costs th. USD/year</td>
<td></td>
<td>0,00</td>
<td>0,18</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
</tr>
<tr>
<td>Total rental expenses th. USD/year</td>
<td>0,00</td>
<td>2,88</td>
<td>3,84</td>
<td>3,84</td>
<td>3,84</td>
<td>3,84</td>
<td>3,84</td>
<td>3,84</td>
<td>3,84</td>
<td>3,84</td>
<td>3,84</td>
<td>3,84</td>
</tr>
<tr>
<td>The number of meetings in a month #</td>
<td></td>
<td>0</td>
<td>2</td>
<td>1,5</td>
<td>1,5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cost per 1 meeting USD/ #</td>
<td></td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Event costs th. USD/year</td>
<td></td>
<td>0,00</td>
<td>9,00</td>
<td>9,00</td>
<td>9,00</td>
<td>6,00</td>
<td>6,00</td>
<td>6,00</td>
<td>6,00</td>
<td>6,00</td>
<td>6,00</td>
<td>6,00</td>
</tr>
<tr>
<td>Expenses for writing equipment, mail USD/month</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
</tr>
<tr>
<td>Other office expenses th. USD/year</td>
<td>0,00</td>
<td>0,90</td>
<td>1,20</td>
<td>1,20</td>
<td>1,20</td>
<td>1,20</td>
<td>1,20</td>
<td>1,20</td>
<td>1,20</td>
<td>1,20</td>
<td>1,20</td>
<td>1,20</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

### Marketing expenses.

To increase the Association’s awareness, as well as for the building up a good reputation, monthly marketing expenses for 1 000 USD per month are planned for the promotion of the Association on the market.

Marketing expenses will also help attract new projects for the cluster and new members to the Association.

In addition to the costs mentioned above, the reserve fund of $ 250 per a month is also assumed.

For more detailed information on the costs of the Association, see the table below.:
Expenses of LLC

Expenses of LLC will consist of two key blocks:

- costs for the implementation of projects (de facto – costs of subcontractors’ services);
- administrative costs.

The block of expenses of LLC for the implementation of projects was described in the section "Income of IT-companies of the cluster."

The costs for management and maintenance of the LLC, in turn, will consist of several cost items.

**Staff expenses**

For the proper functioning of the LLC, it will be necessary to hire the Director (Head of the Association) and the Accountant.

The director of LLC will perform administrative functions (contract execution, formalizing relations with project customers and subcontractors), as well as assisting and supporting the Head of the Association. The requirements for a manager of this level are lower than the requirements for the Head of the Association. Accordingly, the level of his salary will be lower than the salary of the Head of the Association and may amount to 800-900 USD per month.

The position of the Accountant at LLC, as was previously described in the section "Expenses of the Association," does not imply significant requirements for this specialist and can be united with the position of accountant at the Association. Accordingly, the share of the accountant’s salary that will be expensed a subsidy to LLC will be 800-900 USD per month (considering the specifics of taxation).

**Table 19: Flows of staff expenses of LLC**

<table>
<thead>
<tr>
<th>Staff expenses</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Director</td>
<td>th. USD/month</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.
The office expenses

For proper functioning, considering the insignificant number of employees, LLC will need to rent an office space of up to 20 square meters.

As it was stated in the section “Expenses of the Association,” it is possible to consider the option of common office rental of LLC and the Association, but in this case, the office of a larger area (about 40 sq. m) will be required. The logical distribution of costs, in this case, is 50% by 50%, which is assumed at the moment.

Average market rental rates for office premises in respectable centers with a good location (it is important regarding the implementation of representation functions) are 15-17 USD per square meter without VAT and additional utility costs of 1-2 USD per square meter.

Also, as a component of office expenses, communications, collateral, office and office equipment costs, are planned in the sum of 150 USD per month.

### Table 20: Flows of office expenses of LLC

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rented spaces</td>
<td>sq. m</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Cost of renting 1 sq. m</td>
<td>USD/month</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
<td>15,0</td>
</tr>
<tr>
<td>Number of working months</td>
<td>#</td>
<td>0</td>
<td>9</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Rental costs</td>
<td>th. USD/year</td>
<td>0,00</td>
<td>2,70</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
<td>3,60</td>
</tr>
<tr>
<td>Utilities costs per 1 sq. m</td>
<td>USD/month</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
<td>1,0</td>
</tr>
<tr>
<td>Utilities costs</td>
<td>th. USD/month</td>
<td>0,00</td>
<td>0,18</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
<td>0,24</td>
</tr>
<tr>
<td>Communication and clerical costs</td>
<td>USD/month</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
<td>150,0</td>
</tr>
<tr>
<td>Other office costs</td>
<td>th. USD/year</td>
<td>0,00</td>
<td>1,35</td>
<td>1,80</td>
<td>1,80</td>
<td>1,80</td>
<td>1,80</td>
<td>1,80</td>
<td>1,80</td>
<td>1,80</td>
<td>1,80</td>
<td>1,80</td>
</tr>
<tr>
<td>Total office costs</td>
<td>th. USD/year</td>
<td>0,00</td>
<td>4,23</td>
<td>5,64</td>
<td>5,64</td>
<td>5,64</td>
<td>5,64</td>
<td>5,64</td>
<td>5,64</td>
<td>5,64</td>
<td>5,64</td>
<td>5,64</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

Legal and consulting expenses

To bid for tenders, as well as to involve new projects, it will be necessary for LLC to prepare a significant amount of various document categories. This documentation will include both the analysis of the market for potential projects and the preparation of forms of contracts and acts to formalize relationships with future customers.

Therefore, LLC will need to outsource these functions. Such a solution is more efficient than recruiting the staff of the corresponding employees because future projects will be implemented in different, independent sectors, which will require unique skills in each of the necessary industries.
Cost of non-recurring legal and consulting services (for a project) can be estimated at 18-20 USD thousand. It must also be taken into account that not all projects will be implemented. Accordingly, it is necessary to establish a reserve of 1-2 unrealized projects per year for financial modeling.

### Table 21: Legal and consulting expenses of LLC

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UM 2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of legal services (per 1 tender/project)</td>
<td>th. USD</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Number of projects</td>
<td>#</td>
<td>0</td>
<td>2.5</td>
<td>2.5</td>
<td>3.5</td>
<td>2.5</td>
<td>3.5</td>
<td>2.5</td>
<td>3.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Legal and consulting costs</td>
<td>th. USD/year</td>
<td>0.0</td>
<td>50.0</td>
<td>50.0</td>
<td>70.0</td>
<td>50.0</td>
<td>70.0</td>
<td>50.0</td>
<td>70.0</td>
<td>50.0</td>
<td>50.0</td>
</tr>
</tbody>
</table>

*Source: Civitta team analysis.*

In addition to the costs mentioned above, a contingency reserve of 500 USD per month is considered. For more detailed information about costs of LLC, see the table below:

### Table 22: Expenses flows of LLC

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs for implementation of projects (subcontracting)</td>
<td>th. USD</td>
<td>0.0</td>
<td>555.7</td>
<td>1 220.7</td>
<td>2 273.8</td>
<td>4 129.5</td>
<td>4 683.8</td>
<td>6 165.5</td>
<td>5 182.5</td>
<td>6 665.2</td>
<td>5 681.3</td>
</tr>
<tr>
<td>Projects costs</td>
<td>th. USD</td>
<td>0.0</td>
<td>555.7</td>
<td>1 220.7</td>
<td>2 273.8</td>
<td>3 990.0</td>
<td>4 378.1</td>
<td>5 596.9</td>
<td>4 378.1</td>
<td>5 596.9</td>
<td>4 378.1</td>
</tr>
<tr>
<td>Cost of Embedded solutions support</td>
<td>th. USD</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>139.5</td>
<td>305.7</td>
<td>568.6</td>
<td>804.5</td>
<td>1 068.2</td>
<td>1 303.2</td>
</tr>
<tr>
<td>Management and maintenance costs</td>
<td>th. USD</td>
<td>0.0</td>
<td>82.0</td>
<td>92.6</td>
<td>112.6</td>
<td>92.6</td>
<td>112.6</td>
<td>92.6</td>
<td>112.6</td>
<td>92.6</td>
<td>112.6</td>
</tr>
<tr>
<td>Staff cost</td>
<td>th. USD</td>
<td>0.0</td>
<td>23.2</td>
<td>31.0</td>
<td>31.0</td>
<td>31.0</td>
<td>31.0</td>
<td>31.0</td>
<td>31.0</td>
<td>31.0</td>
<td>31.0</td>
</tr>
<tr>
<td>Salaries</td>
<td>th. USD</td>
<td>0.0</td>
<td>14.9</td>
<td>19.8</td>
<td>19.8</td>
<td>19.8</td>
<td>19.8</td>
<td>19.8</td>
<td>19.8</td>
<td>19.8</td>
<td>19.8</td>
</tr>
<tr>
<td>Taxes</td>
<td>th. USD</td>
<td>0.0</td>
<td>8.4</td>
<td>11.2</td>
<td>11.2</td>
<td>11.2</td>
<td>11.2</td>
<td>11.2</td>
<td>11.2</td>
<td>11.2</td>
<td>11.2</td>
</tr>
<tr>
<td>Office costs</td>
<td>th. USD</td>
<td>0.0</td>
<td>4.2</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
</tr>
<tr>
<td>Legal costs</td>
<td>th. USD</td>
<td>0.0</td>
<td>50.0</td>
<td>50.0</td>
<td>70.0</td>
<td>50.0</td>
<td>70.0</td>
<td>50.0</td>
<td>70.0</td>
<td>50.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Other costs</td>
<td>th. USD</td>
<td>0.0</td>
<td>4.5</td>
<td>6.0</td>
<td>6.0</td>
<td>6.0</td>
<td>6.0</td>
<td>6.0</td>
<td>6.0</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td>TOTAL IT cluster’s costs</td>
<td>th. USD</td>
<td>0.0</td>
<td>637.7</td>
<td>1 313.3</td>
<td>2 386.4</td>
<td>4 222.1</td>
<td>4 796.4</td>
<td>6 258.1</td>
<td>5 295.2</td>
<td>6 757.8</td>
<td>5 793.9</td>
</tr>
</tbody>
</table>

*Source: Civitta team analysis.*

The volume of LLC expenses for taxes on salaries will directly depend on the chosen tax regime. Under the specified conditions, it is planned that the LLC will apply general tax regime. It is reasonable to suggest, as it is more effective regarding the total tax burden.

In the case of GTR application, the volume of taxes on salaries will be by 4.7 thousand USD per year higher than if the preferential tax regime for HTPs is applied. However, the use of a preferential tax regime for HTP means payment of 1% of the revenue received by LLC (on average 25-50 thousand USD per year in 2020-2022). Simultaneously, profit tax with GTR for the same period will be only 1.5-25 thousand USD.

Furthermore, at the initial stage, LLC will not receive profit and, accordingly, will not pay profit tax with GTR. When using the preferential HTP regime, even if there is no profit, LLC will have to pay 1% of the revenue tax.

Consequently, in spite of the larger volume of payroll tax expenses, the use of GTR will reduce the general tax burden in comparison with the preferential regime of HTP.
5.3. Investment for the cluster development

Investment for LLC development

Investments for growth will be crucially needed to launch the cluster and ensure its proper functioning. Taking into account the planned income and expenses flows, the loss from the activities of LLC in 2018-2019 years will be 0.08 mn USD, which will represent the amount of necessary investment (Table 22).

This investment can be formalized as the authorized capital of LLC, contributed by the Association as the founder of LLC.

Table 23: Profit/Loss flows of LLC

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenue, excl. VAT</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.58</td>
<td>1.28</td>
<td>2.39</td>
<td>4.35</td>
<td>4.93</td>
<td>6.49</td>
<td>5.46</td>
<td>7.02</td>
<td>5.98</td>
<td>7.54</td>
</tr>
<tr>
<td>Revenue from projects</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.58</td>
<td>1.28</td>
<td>2.39</td>
<td>4.20</td>
<td>4.61</td>
<td>5.89</td>
<td>4.61</td>
<td>5.89</td>
<td>4.61</td>
<td>5.89</td>
</tr>
<tr>
<td>Revenue from projects</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.15</td>
<td>0.32</td>
<td>0.60</td>
<td>0.85</td>
<td>1.12</td>
<td>1.37</td>
<td>1.65</td>
</tr>
<tr>
<td>Total costs</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.64</td>
<td>1.31</td>
<td>2.39</td>
<td>4.22</td>
<td>4.80</td>
<td>6.26</td>
<td>5.30</td>
<td>6.76</td>
<td>5.79</td>
<td>7.26</td>
</tr>
<tr>
<td>Projects costs (subcontracting)</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.56</td>
<td>1.22</td>
<td>2.27</td>
<td>4.13</td>
<td>4.68</td>
<td>6.17</td>
<td>5.18</td>
<td>6.67</td>
<td>5.68</td>
<td>7.16</td>
</tr>
<tr>
<td>Management and maintenance costs</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.08</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>Earnings before tax</td>
<td>mn. USD</td>
<td>0.00</td>
<td>-0.05</td>
<td>-0.03</td>
<td>0.01</td>
<td>0.12</td>
<td>0.13</td>
<td>0.23</td>
<td>0.16</td>
<td>0.26</td>
<td>0.19</td>
<td>0.28</td>
</tr>
<tr>
<td>Profit tax</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
<td>0.02</td>
<td>0.04</td>
<td>0.03</td>
<td>0.05</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Net profit/loss</td>
<td>mn. USD</td>
<td>0.00</td>
<td>-0.05</td>
<td>-0.03</td>
<td>0.01</td>
<td>0.10</td>
<td>0.11</td>
<td>0.19</td>
<td>0.13</td>
<td>0.21</td>
<td>0.15</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

Furthermore, the net profit that LLC will receive from 2020 will be transferred to the account of the Association as dividends, and then it will be used to finance the master program and research activities of the University.

Therefore, the profit received by the LLC will reduce the need for investment in the development of the Association, which will be described in more detail in the section “The Association’s need for external investment.”

The Association’s need for external investment (including needs of LLC)

In 2018, it will be necessary to form a seed funding of 0.2 mn USD to launch the cluster (the Association and LLC). This capital will be used in the following areas:

- foundation and financing of master program and scientific, research activities;
- administration of the Association;
- investment in the authorized capital of LLC.

Because only in 2021 the active work of the LLC and the generation of its profit will begin, in 2019, additional investments of 0.25 mn USD will be required. In the future, the need for investments will decrease as the profit of the cluster increases.

Table 24: Income/expenses flows of the Association

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue from LLC (dividends)</td>
<td>mn. USD</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.005</td>
<td>0.090</td>
<td>0.097</td>
<td>0.167</td>
<td>0.116</td>
<td>0.186</td>
<td>0.134</td>
<td>0.205</td>
</tr>
</tbody>
</table>
Consequently, the total volume of necessary investment in 2018-2020 will be 0.64 USD million (with a steady requirement of 0.216 USD million per year). It is planned that the capital for investments will be founded by the members of the Association with membership fees. At the initial stage, the planned number of members of the Association is 18-20 organizations. In this case, the average annual membership fee will be 10.7 USD. The need for investment is not equal for each year, that is why membership fees also will differ.

Table 25: Number of members of the Association and volume of members’ fee

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UMS</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments requirements th. USD</td>
<td>0.00</td>
<td>187.38</td>
<td>243.59</td>
<td>207.23</td>
<td>113.52</td>
<td>104.00</td>
<td>33.29</td>
<td>85.06</td>
<td>14.32</td>
<td>66.12</td>
<td>-4.59</td>
<td></td>
</tr>
<tr>
<td>Number of Association members #.</td>
<td>3</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>32</td>
<td>34</td>
<td>36</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Average cost of membership fee th. USD</td>
<td>0.00</td>
<td>9.37</td>
<td>11.07</td>
<td>8.63</td>
<td>4.37</td>
<td>3.71</td>
<td>1.11</td>
<td>2.66</td>
<td>0.42</td>
<td>1.84</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

Since 2020, the membership fees will be reduced as a result of the growth in the number of members of the Association and decrease in need for investment.

5.4. Impact of a change in key indicators on the results of the Association’s activities

Application of the preferential tax regime of HTP by LLC

As it was partially described in the section "Expenses of LLC" LLC can choose one of two tax regimes:

- General tax regime (GTR);
- Preferential tax regime of HTP.

Considering the planned structure of revenues/costs, applying of Common System of Taxation to LLC is financially feasible since it reduces tax costs compared to Preferential System of Taxation (HTP).

In the previous paragraphs, costs and investments requirements in the in the case of Preferential System of Taxation were described. The calculation of similar indicators in the case of Preferential System of Taxation (HTP) is presented below.
Investments requirements of LLC will increase from 80 thousand USD in 2018-2019 up to 100 thousand USD if Preferential System of Taxation (HTP) is applied. At the same time, total net income will decrease from 1.13 mn USD up to 0.99 mn USD in 2021-2027.

The main reason for the decline is the planned structure of revenues/expenditure, the revenue tax in the amount of 1% will be significantly higher than the profit tax of 18%.

In turn, the growth of investment requirements and the reduction in future planned revenues will lead to an increase in the investment requirements of the Association. In this case, it will be necessary to either increase the size of the membership fees or increase the number of members.

**Change in number of students**

Students’ enrollment is one of the key indicators, affecting the resulting indicators:

- revenue of IT cluster members (University);
- expenditures of IT cluster members (IT companies);
- investment requirements (Association).

In the planned option, it is expected to train 25 undergraduates per year, which will generate an acceptable level of the University’s revenue and allows to provide a high quality of education. At the same time, the Association will finance the education of 80% of undergraduates, i.e., 20 people.

If the amount of financing by the Association increases to 100%, it will not affect the level of the University’s revenue, but will investment requirements of the Association, which in turn will require an increase in membership fees. A more detailed comparison is given in the table below.

---

**Table 26: Expenses and need for investment of LLC in case of preference tax regime of HTP**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenue, excl. VAT</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.58</td>
<td>1.28</td>
<td>2.39</td>
<td>4.35</td>
<td>4.93</td>
<td>6.49</td>
<td>5.46</td>
<td>7.02</td>
<td>5.98</td>
<td>7.54</td>
</tr>
<tr>
<td>Revenue from projects</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.58</td>
<td>1.28</td>
<td>2.39</td>
<td>4.20</td>
<td>4.61</td>
<td>5.89</td>
<td>4.61</td>
<td>5.89</td>
<td>4.61</td>
<td>5.89</td>
</tr>
<tr>
<td>Revenue from projects</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.15</td>
<td>0.32</td>
<td>0.60</td>
<td>0.85</td>
<td>1.12</td>
<td>1.37</td>
<td>1.65</td>
</tr>
<tr>
<td>Total costs</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.63</td>
<td>1.31</td>
<td>2.38</td>
<td>4.22</td>
<td>4.79</td>
<td>6.25</td>
<td>5.29</td>
<td>6.75</td>
<td>5.79</td>
<td>7.25</td>
</tr>
<tr>
<td>Projects costs (subcontracting)</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.56</td>
<td>1.22</td>
<td>2.27</td>
<td>4.13</td>
<td>4.68</td>
<td>6.17</td>
<td>5.18</td>
<td>6.67</td>
<td>5.68</td>
<td>7.16</td>
</tr>
<tr>
<td>Management and maintenance costs</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.08</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>Earnings before tax</td>
<td>mn. USD</td>
<td>0.00</td>
<td>-0.05</td>
<td>-0.02</td>
<td>0.01</td>
<td>0.13</td>
<td>0.14</td>
<td>0.24</td>
<td>0.16</td>
<td>0.26</td>
<td>0.19</td>
<td>0.29</td>
</tr>
<tr>
<td>Profit tax</td>
<td>mn. USD</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>0.04</td>
<td>0.05</td>
<td>0.06</td>
<td>0.05</td>
<td>0.07</td>
<td>0.06</td>
<td>0.08</td>
</tr>
<tr>
<td>Net profit/loss</td>
<td>mn. USD</td>
<td>0.00</td>
<td>-0.05</td>
<td>-0.04</td>
<td>-0.01</td>
<td>0.09</td>
<td>0.09</td>
<td>0.17</td>
<td>0.11</td>
<td>0.19</td>
<td>0.13</td>
<td>0.21</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.

---

**Table 27: Comparison of key performance indicators in the case of increased funding by the Association**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>incl. financed by the Fund</td>
<td>pers.</td>
<td>0</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>University’s revenue</td>
<td>th. USD/year</td>
<td>0.0</td>
<td>86.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
</tr>
<tr>
<td>Investments requirements</td>
<td>th. USD</td>
<td>0.00</td>
<td>187.38</td>
<td>243.59</td>
<td>207.23</td>
<td>113.52</td>
<td>104.00</td>
<td>33.29</td>
<td>85.06</td>
<td>14.32</td>
<td>66.12</td>
<td>-4.59</td>
</tr>
<tr>
<td>Number of members of the Association</td>
<td>#</td>
<td>3</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>32</td>
<td>34</td>
<td>36</td>
<td>38</td>
</tr>
</tbody>
</table>
The total need for investments will increase by 72.5 th USD, which will lead to an increase in the average membership fee by 0.5-1.5 th USD per year for each member of the Association. At the same time, the University’s income will remain the same.

**Changing characteristics of projects, implemented by LLC**

The number, duration, as well as the volume of the projects, which are going to be implemented by LLC, are key parameters that affect the resulting indicators:

- income of the cluster members (LLC and IT-companies);
- expenses of the cluster members (IT-companies);
- the need for investment (the Association).

It is planned that LLC will specialize in large (3-4 mn USD) and long-term projects (2-3 years), which will ensure guaranteed revenue to companies-subcontractors for these projects, as well as reduce the membership fees from 2021 through the generation of profit.

One of the possible options is a significant increase in the number of projects with a decrease in their cost. The implementation of this type of projects will cause the decrease in the revenues of LLCs and the revenues of IT-companies. The implementation of short-term projects also excludes revenue from supporting developed solutions. Also, there will be certain difficulties with the search of such some projects. Moreover, the organizational scheme of work through the Association will lose value for IT-companies as they can potentially find and carry out such projects using its resources and at its own expense.

Consequently, the decrease in revenue will cause an increased need for investment. Over the entire period of project implementation, the need for investment will increase up to 1.15 mn USD. If at the initial stage, the effect on the membership fees will be positive (decreasing in comparison with the main option), since 2021, the membership fees will increase compared with the main option in 1,5-2 times, even despite the possibility of increasing the number of members due to the number of projects.

Therefore, this option will not have an impact on the income of the University directly, but taking into account the effectiveness of this option for IT-companies, it can be assumed that in the future it will lead to a decrease in the funding the master program.

Table 28: Comparison of key indicators in the case of changing types of projects

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>University's revenue th. USD/year</td>
<td>0</td>
<td>86,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
</tr>
<tr>
<td>Investments requirements th. USD</td>
<td>0</td>
<td>201,88</td>
<td>272,59</td>
<td>228,98</td>
<td>120,77</td>
<td>104,00</td>
<td>33,29</td>
<td>85,06</td>
<td>14,32</td>
<td>66,12</td>
<td>-4,59</td>
<td></td>
</tr>
<tr>
<td>Number of members of the Association</td>
<td>#</td>
<td>3</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>32</td>
<td>34</td>
<td>36</td>
<td>38</td>
</tr>
<tr>
<td>Average cost of membership fee th. USD</td>
<td>0</td>
<td>10,09</td>
<td>12,39</td>
<td>9,54</td>
<td>4,64</td>
<td>3,71</td>
<td>1,11</td>
<td>2,66</td>
<td>0,42</td>
<td>1,84</td>
<td>-0,12</td>
<td></td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.
Setting fixed membership fee

A number of membership fees is one of the resulting indicators, significantly affecting other indicators and assumptions:

- expenditures of IT Cluster members (IT companies);
- revenues of IT Cluster members (University);
- a number of enrolled students.

In the planned option, the membership fee is flexible and depend on the needs of the IT Cluster. At the same time, a number of contributions is significant at the beginning of the project and will decrease as the IT cluster will implement its projects. As a result, a number of membership fees approaches almost zero by 2025.

Establishment of fixed membership fees since the establishment of the Association will significantly slow the overall development of the IT cluster.

Therefore, if, with the other assumptions unchanged, the average membership fee is set at 3,000 USD and is kept at the same level throughout the forecast period, the Association will not be able to finance the education of any students. Moreover, funds from contributions will not be enough for running the Association itself.

In this option, the university will start to receive revenues from the Association starting from 2021.

---

Table 29: Comparison of key indicators in case of fixing a fixed membership fee

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of ongoing projects</td>
<td>#</td>
<td>0</td>
<td>15</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>25</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Average project cost</td>
<td>th. USD</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
<td>40,0</td>
</tr>
<tr>
<td>University’s revenue</td>
<td>th. USD/yr</td>
<td>0,00</td>
<td>86,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
<td>163,0</td>
</tr>
<tr>
<td>IT companies’ revenue</td>
<td>th. USD/yr</td>
<td>0,00</td>
<td>570</td>
<td>760</td>
<td>760</td>
<td>950</td>
<td>950</td>
<td>1,140</td>
<td>1,140</td>
<td>1,140</td>
<td>1,140</td>
<td>1,140</td>
</tr>
<tr>
<td>Investments requirements</td>
<td>th. USD</td>
<td>0,00</td>
<td>161,63</td>
<td>242,84</td>
<td>249,94</td>
<td>231,14</td>
<td>228,24</td>
<td>218,24</td>
<td>228,24</td>
<td>208,24</td>
<td>218,24</td>
<td>208,24</td>
</tr>
<tr>
<td>Number of members of the Association</td>
<td>#</td>
<td>3</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>55</td>
<td>60</td>
<td>65</td>
<td>70</td>
<td>75</td>
</tr>
<tr>
<td>Average cost of membership fee</td>
<td>th. USD</td>
<td>0,00</td>
<td>5,39</td>
<td>6,94</td>
<td>6,25</td>
<td>5,14</td>
<td>4,56</td>
<td>3,97</td>
<td>3,80</td>
<td>3,20</td>
<td>3,12</td>
<td>2,78</td>
</tr>
</tbody>
</table>

Source: Civitta team analysis.
In such a situation, a few undergraduates will be necessary to start a normal functioning of Master’s Program:

- **Significantly increase the number of members of the Association**. At the same time, the value of participation in the Association for them will be lower, since it will not graduate enough specialists.

- **Reduce the costs of the Association and LLC**. The vast majority of are subcontracting expenses (95% of revenue). Reducing these costs will lead to a reduction in the IT companies’ revenues, which will also reduce the attractiveness of participation in the cluster for them.

- **Increase fixed membership fee** (at least initially).

Thus, the “planned” option is the most optimal from its viability (feasibility) as well as its efficiency and profitability for all participants in the IT cluster.

---

<table>
<thead>
<tr>
<th>Indicators</th>
<th>UM</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>University’s revenue</td>
<td>th. USD/year</td>
<td>0.00</td>
<td>86.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
<td>163.0</td>
</tr>
<tr>
<td>Investments requirements</td>
<td>th. USD</td>
<td>0.00</td>
<td>187.38</td>
<td>243.59</td>
<td>207.23</td>
<td>113.52</td>
<td>104.00</td>
<td>33.29</td>
<td>85.06</td>
<td>14.32</td>
<td>66.12</td>
<td>-4.59</td>
</tr>
<tr>
<td>Number of members of the Association</td>
<td>#</td>
<td>3</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>32</td>
<td>34</td>
<td>36</td>
<td>38</td>
</tr>
<tr>
<td>Average cost of membership fee</td>
<td>th. USD</td>
<td>0.00</td>
<td>9.37</td>
<td>11.07</td>
<td>8.63</td>
<td>4.37</td>
<td>3.71</td>
<td>1.11</td>
<td>2.66</td>
<td>0.42</td>
<td>1.84</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**The option of increase in share of funding by the Association**

**Source:** Civitta analysis.
6. ICT cluster development options

Regardless of the sphere, clusters are usually created to solve some economic and social issues. Thus, the main tasks of creating and developing ICT cluster in the Republic of Belarus may be defined as follows:

- improvement of the IT education;
- development of the IT industry in general;
- implementation of the complex state projects.

At the same time, performance always depends on a combination of factors related to the so-called framework conditions (the socioeconomic environment, the regulatory environment, the business conditions); the strength of the cluster enterprises; and the quality of cluster management (meaning the capability of cluster organizations to coordinate and promote the activities of cluster members).

The fulfillment of these tasks implies certain optionality in the development of the cluster. Depending on the priority in achieving certain tasks, it is possible to use various options throughout its creation and development.

For the assessment of different options for the cluster’s programs implementation, it is possible to identify some key performance indicators (KPIs) for each of the cluster’s tasks:

**Improvement of the IT education and science:**

- number of patents granted in comparison to the industry average;
- investment in R&D in comparison to the industry average;
- a number of students.

**Development of the IT industry in general:**

- output;
- export volume;
- the volume of solutions implemented in the domestic market;
- a number of companies in the cluster.

**Implementation of the complex state projects:**

- number projects implemented;
- the volume of investments attracted.

In addition to the tasks mentioned above and the corresponding KPIs, for the organizational options, it is also worth emphasizing such an evaluation criterion as the simplicity of creating and administering the cluster (Figure 19).
Proceeding from the available options of the cluster development and its KPI’s, it is possible to predict the degree of effectiveness of their implementation, depending on the use of certain development options.
6.1. Organizational (legal) options

**Legal form**

The focal point for representing the interests of member organizations of an IT cluster can be a non-profit organization created in the form of an association or a commercial organization created in the form of a limited liability company (LLC).

Advantages of LLC in comparison to Association:

- more detailed and developed legislation regulating the creation and operation of the LLC (compared to the legal regulation of associations);
- legally mandatory and widely used mechanisms of corporate transformations within the structure (in particular, explicit and clear procedures for withdrawal and exclusion of participants, distinct rules of voting on particular issues, a division of competences among the management bodies, etc.).

---

**Figure 20: Organizational options of the ICT cluster development**

<table>
<thead>
<tr>
<th>Legal form</th>
<th>Improvement of the IT edu. and science</th>
<th>Development of the IT industry in general</th>
<th>Implementation of the complex projects</th>
<th>Simplicity of creation and administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>LLC</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Association</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>IT companies</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Grants, sponsorship</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Governmental support</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

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**Source:** Civitta team analysis.
Disadvantages of LLC in comparison to Association:

- restricted maximum number of participants (50);
- the shares must be distributed among the LLC1 participants before incorporation;
- strict mandatory control of corporate decision-making and the number of voices needed for particular decisions. In particular, where participants wish to provide additional financing for LLC1 using augmenting the authorized fund on account of all LLC’s participants, under p. 1, art. 105 of the Business Companies Law, this will be allowed only by a unanimous decision of the General Meeting of participants. An increase of the authorized fund on account of one or several participants is also allowed by a unanimous decision of all participants;
- the inconsistency of the tentative goals of the future IT cluster and those of LLC1. LLC1 is a commercial entity, and its main goal is commercializing on its activities. According to the information delivered by the Client, the IT cluster’s main goal is an alliance of some interested organizations to implement common interests and coordinate common actions and goals;
- individual participants and/or groups of participants will be able to block some decisions, which pertain to the competence of the General Meeting of LLC1’s participants. Some decisions will require a unanimous voting and/or a special majority (for instance, decisions on any corporate restructuring, dissolution on any major transactions (i.e., transactions worth more than 20% of the LLC1’s book value), and other decisions). This poses a risk regarding management and control, in case some decisions made by the IT cluster not correspond to the interests of particular participants.

Given those mentioned above and due to the accounting for the quite large number of potential participants of the IT cluster and strict control procedures about LLC1, we believe that Association will be more reasonable option regarding control and flexibility of key decision-making.

Sources of cluster financing

In addition to getting profits from the implementation of projects, it is assumed that there will be three more main sources of funding within the projected cluster:

- Funding from the companies-members of the IT cluster, in general, can be carried out in the form of contributions. At the same time, such financing might be within the corporate relations or not. Outside of the corporate relations, the IT cluster can be financed by its participants and the other IT companies through contractual relationships. This financing option is the most realistic, but at the same time, the least profitable, since the participants' funds will be attracted.

- As a rule, grants are provided in the following forms:
  - free donations from Belarusian entities;
  - free donations by foreign entities (foreign gratis aid), including monetary funds, interest-free loans, property assets and property right;
  - other forms of grants defined by the grantors.

This financing option is quite advantageous from all points of view. However, it requires some preliminary work.

IT cluster can also receive state support for its activities. Such support can be provided in various forms, each of them have special requirements and procedures. This option, like the previous one, is very beneficial, but it requires some preliminary work.
Location
The cluster management can be located in a separate rental office, in the cluster-member company or in the BSU.

Locating in the territory of the university or in the cluster-member company obviously allows reducing the transaction costs; however, in this case, a certain dependence appears. At the same time, there will be no significant cost savings - in any case; it will be necessary to invest in rent.

Locating in the university will allow improving interaction with the university in the part of the educational process.

Thus, from the simplicity of regulation, the most optimal will be the option of renting a separate office.

Control of the cluster

Association management structure

Association business management structures are usually two-tiered or three-tiered. In case of the three-tiered structure, the Association structure will comprise:

- Supreme management body – the General Meeting (Conference, Assembly, or another name). This body exercises representative capacities and comprises a representative of each of Association members;
- Collective management body – the Board (Council, Board of Directors, Association Board, or another name). This body may comprise any number of elected members (at least 2). Competence, methods of electing, decision-making procedures and other issues of the Board’s activities will be defined by the Association Charter;
- Sole executive body – Chairman (Director, President or another name). Chairman may exercise operating management of Association activities;

In case of the two-tiered structure, the Association’s management structure will include:

- Supreme management body;
- Sole executive body;
- If necessary – Secretariat and a supervisory/inspection body.

Considering the choice of an appropriate Association management structure, we should note that the current laws do not delimit the competencies of its bodies. In this regard, Association founders are entitled to establish a most suitable management format all by themselves.

Thus, if the number of Association members is relatively short (approximately from 3 to six entities), then we believe that a two-tier management system will suffice: the General Meeting of Association members comprising such short number of members will be able to meet swiftly to make relevant decisions. The executive body, in such format, will give effect to decisions made by the Association’s supreme management body (the General Meeting), and also exercise some independent functions.

Summarizing the description of the Association as the tentative center of the IT cluster, we should note that the legal control of associations’ and unions’ activities in the Republic of Belarus is today extremely fragmentary and is only limited to articles 121 to 123 of the Civil Code of the Republic of Belarus. In this regard, the crucial aspects of Association activities mentioned above should be thoroughly specified in the Association Charter during its preparation, with due to account for all members’ interests.

LLC business management procedures

By the Law on Business Associations, the following options for the structure of LLCs with one participant are possible:
• Two-tier structure of management bodies:
  • management bodies: Sole participant and an executive body (sole or collective);
  • controlling body (Auditor or Auditing Commission).

• The three-tiered structure of management bodies:
  • management bodies: Sole participant, Supervisory board (Board of directors), executive body (sole or collective);
  • controlling bodies (Auditor or Auditing Commission).

In this variant, the Association is the sole participant of the LLC. This means that all decisions relating to LLC’s activities and pertaining to the competence of the LLC’s supreme management body will be taken by the Association itself at its sole discretion.

Regarding the question of a specific structure of the Association’s LLC’s management bodies, we must note that each of the proposed options has its peculiarities, which in each case may be treated as positive or negative.

Thus, the three-tiered management structure is seen as a preferable option, as it implies the inclusion of more companies into the cluster and, as a result, will increase the number of projects and some investments attracted.

Financing of the scholarship fund

Financing of the scholarship fund may be carried out by students, IT companies or through the grants attraction. Funding from IT companies and students are the easiest options regarding implementation, but it will reduce the demand for the Master’s program from the students and the participation in the cluster from the companies respectively. The attraction of grants seems to be the most beneficial option for all parties, but it requires a certain amount of work to attract them.

6.2. Educational options

It is possible to identify certain options of the internship base and the projects implemented during this internship.

Figure 21: Educational options of the ICT cluster development

Source: Civitta team analysis.
It is preferable to undergo it in companies working on the real projects, particularly within the ICT cluster, because in such conditions the greatest effect is achieved for both graduates, who have the opportunity to prove themselves on a real project, and for companies that get highly qualified specialists in their the disposal. In addition, the government will not remain the loser here, as it is envisaged that the work within the cluster will primarily be aimed at implementing complex state projects. Internship in the university will not facilitate the implementation of real projects, as well as the attraction of students to the magistracy. The third place is understood as any other company or organization (including the state-owned), where it would be possible to have an internship. In this case, the success of its impact on the KPI of the cluster will depend on what kind of organization it would be.

6.3. Commercial options

**Participation in projects**

Participation in projects may be carried out through tenders or direct legislative designation of the cluster for the role of executor of the complex state projects. At the same time, within the participation in tenders it is possible to distinguish their following types:

- state-funded tender;
- tender financed by private funds.

Tenders implying financing from public funds normally feature stricter rules of the election of winners, stricter payment procedures and requirements for special documentation. Also, where any intellectual property objects are created at the expense of government funding, exclusive rights to objects created under such tender must be transferred to the state, i.e. if financing is carried out by the state, then all rights on the outcomes of such activities will be transferred to the state. It is unlikely that the IT cluster will reserve its right in such a situation and will be able to monetize the newly created intellectual property objects in the future.
Thus, participation in tenders includes some legislative restrictions. In turn, direct cooperation between the cluster and the state will help to avoid these issues and allow putting more resources to the implementation of projects, which, as a result, will increase their effectiveness. This method requires lobbying of the cluster’s interests, which increases the requirements for its leader. As for the other tasks of the cluster, the way of participating in the projects does not have a significant impact.

**Target market/customer/scale of the projects**

The nature of the implemented projects also implies a certain variability. The implementation of state projects will contribute to the fulfillment of all tasks of the cluster, in particular, the development of ICT education and science, and will also most accurately meet the main goals of its creation.

The scale of the implemented projects will almost equally affect the fulfillment of all tasks, however, at first, it is envisaged that priority will be given to the complex ones.

When choosing sales markets, it would be worthwhile to focus on both internal and external, but the goals of creating the cluster primarily involve working on the national market. In the future, if sufficient resources are available, it will be possible to replicate ready complex projects for other countries, as well as to fulfill smaller projects for the needs of the private sector.

**Search of the customers**

It is assumed that the head of the cluster will perform the function of searching the projects. He will interact with government bodies and lobby the interests of the cluster.

From educational or public tasks, the way of implementing this function does not matter. However, for the commercial companies it is obvious that the most favorable way of searching will be lobbying for these projects by the leader of the cluster - in this case, the cluster members will not spend too many resources on the attraction of the customers. Therefore, the cluster acts as a sales service for its members.

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**Figure 22: Commercial options of the ICT cluster development**

<table>
<thead>
<tr>
<th>Commercial</th>
<th>Particip. in projects</th>
<th>Target market</th>
<th>Customer</th>
<th>Scale of projects</th>
<th>Search of the customers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Legislatively mandated</td>
<td>Through the tender</td>
<td>Interior</td>
<td>External</td>
<td>Both simultaneously</td>
</tr>
<tr>
<td></td>
<td>−</td>
<td>−</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Through the tender</td>
<td>−</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>−</td>
<td>−</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

- Promotes
- Partly promotes
- No impact

*Source: Civitta team analysis.*
With the development of the cluster or with the need to increase the number of projects, more active search for customers will be required. To fulfill this task, it is possible to use internal resources of the companies-members of the cluster if they have employees who have relevant experience and competencies. An alternative option is to hire full-time employees with such responsibilities or hire outsourcing services.

Thus, all the alternatives of cluster development have their advantages and disadvantages from the fulfillment of the given KPIs. Therefore, to achieve the greatest efficiency of its functioning, it is possible to combine several development options simultaneously, as well as to vary them at different stages of cluster development.
Conclusion

The rapid development of the Belarusian IT industry over the past ten years is a result of the foundation of the High-Tech Park, the qualification level of local IT professionals and the export orientation of the sector. The growth of the IT sector is much ahead of other industries of the Republic of Belarus due to the implementation and use of new technologies. Increasing the competitiveness of Belarusian products is one of the priorities of state economic policy, and it can be stated that the cluster at the BSU can and should fill the gap between the high-tech IT industry and the rest industries of the Republic of Belarus.

The foundation of a cluster at the BSU will unite IT companies, the university, and the real sector companies, and create an initial platform for the competition of local companies with international suppliers of integrated systems. The cluster will help companies combine their efforts and competencies and develop complex systems that they would not be able to create separately. Also, the cluster will act as a mediator in the negotiations in public procurement procedures, which will significantly increase the share of Belarusian integrated systems in state enterprises. The development of the Belarusian market of complex systems’ suppliers and the positive experience of the implementation in the local market will enhance the sale of cluster products abroad.

The cooperation of the cluster with BSU will create the possibility to use the extensive research capabilities of the university, receive a constant inflow of talented young staff and interact with state bodies. At the same time, the cluster will provide the university with the necessary financial support for hiring qualified lecturers, help to change educational programs to better match the competencies of graduates to the requirements of IT companies, provide a basis for practice on real projects and further employment. As a result, the cluster will significantly improve the quality of IT education in the Republic of Belarus.

Thus, the very idea of the cluster is unquestionably successful and will contribute to the development of both the internal market of IT solutions and the product model of the IT industry of the country.

The idea of a cluster is quite realistic, given the current legislative framework. Nevertheless, due to the presence of "white spots" in the legislation, this idea can be realized by creating several legal entities:

- the basis of the cluster will be the Association of IT companies;
- to carry out commercial functions, this Association will establish LLC;
- a separate Scholarship Fund will take care of the funding of undergraduate students. At the same time, the financing of the master’s program will be quite variable and allow for any form of facilitation of tuition fees.

Obviously, such legal entities lead to additional costs for administering the IT cluster. To reduce these costs, a subsidiary LLC will be registered in the High Technologies Park to obtain tax privileges.

The main challenge for the cluster development is the search for a cluster leader. The cluster leader plays a huge role in cluster’s organization and development, ensuring the search for interested companies, the selection of potential projects, and communication between the various parties in the cluster and outside it. We can say that this figure is the cornerstone on which depends the success or failure of the whole idea.