EU4Digital

EU4Digital: supporting digital economy and society in the Eastern Partnership

Guide for building the ICT entrepreneurial ecosystems in the Eastern partner countries:

Maturity analysis and recommendations

Final report

March 2021

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Abbreviations

Table 1. List of abbreviations

Abbreviation	Full name
AA	Association Agreement
ADA	Azerbaijan Diplomatic Academy
AGEPI	State Agency on Intellectual Property
AGTech	Agricultural Technology
AI	Artificial Intelligence
AID-VENTURE	Facilitating Access to Venture Funding in Belarus
ANAS	Azerbaijan National Academy of Sciences
ANAU	Armenian National Agrarian University
ANEL	Armenian National Engineering Laboratories
ATIC	Association of ICT Companies
ATN	Armenian Trade Network
AUA	American University of Armenia
BAN	Business Angel Network
BfD	Broadband-for-Development
BMZ	German Federal Ministry of Economic Cooperation and Development
BSU	Belarusian State University
BSU	Batumi Shota Rustaveli State University
CAPEX	Capital Expenditure
CCNA	Cisco Certified Network Associate
CCNP	Cisco Certified Network Professional
CEO	Chief Executive Officer
CEP	Competitive Economy Programme
CIC	Convergence Innovation Competition

Abbreviation	Full name
CIV	Climate Innovation Vouchers
CNC	Computer Numerical Control
COAF	Children of Armenia Fund
CPT	Corporate Profit Tax
DCFTA	Deep and Comprehensive Free Trade Agreement
Eastern partner countries	Six Eastern Neighbourhood countries (Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova, Ukraine)
EBAN	European Business Angels Network
EBRD	European Bank for Reconstruction and Development
EEN	Enterprise Europe Network
EG	Enterprise Georgia
EIF	Enterprise Incubation Foundation
EPIC	Entrepreneurship and Product Innovation Centre
EPRC	Economic Policy Research Center
ESIC	Early-stage Investment Conference
EU	European Union
Fab Lab	Fabrication Laboratory
FAST	Foundation for Armenian Science and Technology
FEZ	Free Economic Zone
FFF	Friends, Family, and Fools
FINTECC	Finance and Technology Transfer Centre for Climate Change
FMO	Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden – Dutch Development Bank
FPT	Financing and Promoting Technology
GAU	Georgian American University
GCC	Gulf Cooperation Council
GCIP	Global Cleantech Innovation Programme

Abbreviation	Full name
GDG	Google Developer Group
GEclose2EU	Georgian Business Close to Europe
GEL	Georgian Lari
GENIE	Georgian National Innovation Ecosystem
GEW	Global Entrepreneurship Week
GiC	Global Innovation Catalyst
GIPA	Georgian Institute of Public Affairs
GIST	Global Innovation through Science and Technology
GITA	Georgia's Innovation & Technology Agency
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GTC	Gyumri Technology Center
GTU	Georgian Technical University
GVCA	Georgian Venture Capital Association
GWIT	Georgian Woman in Tech
HD	High-Definition
IC KAU	Innovation Center of Kyiv Academic University
ICI	Research and Innovation Institute of the State University of Moldova
ICO	Initial Coin Offering
ICT	Information and Communications Technology
IHUB	Impact Hub
ILIAUNI	Ilia State University
IMG	Innovation Matching Grants
INNOVATE	Innovation-Based Economic Development and Private Sector Growth in Belarus
IPO	Initial Public Offering
IR	Investment Readiness

Abbreviation	Full name
ISTC	Innovative Solutions and Technologies Centre
IT	Information Technology
ITDC	Information Technology Development Centre
ITEA	IT Education Academy
KPI	Key Performance Indicator
LCS	Laboratory and Computer Science
LLC	Limited Liability Company
M&A	Mergers and Acquisitions
MCP	Moldova Competitiveness Project
MDL	Moldovan Leu
MIC	Microsoft Innovation Center
MoESD	Ministry of Economy and Sustainable Development of Georgia
MSME	Micro, Small, and Medium Enterprises
MVP	Minimum Viable Product
N/A	Not Available
NASA	National Aeronautics and Space Administration
NGO	Non-Governmental Organisation
NIF	Neighbourhood Investment Facility
NLP	Natural Language Processing
ODIMM	Organisation for Small and Medium Enterprises Sector Development
OECD	Organisation for Economic Co-operation and Development
PAIH	Polish Investment and Trade Agency
PCB	Printed Circuit Board
PCT	Patent Cooperation Treaty
PE	Private Equity

Abbreviation	Full name
PIT	Personal Income Tax
PSD SC	Private Sector Development South Caucasus
R&D	Research and Development
RA	Republic of Armenia
RAU	Russian-Armenian University
RBF	Russian-Belarusian Venture Investment Fund
RIAM	Moldovan Business Incubators Network
RIH	Regional Innovation Hub
RMG	Regional Matching Grants
RVC	Russian Venture Company
SaaS	Software as a Service
SAKPATENTI	National Intellectual Property Centre of Georgia
SDG	Sustainable Development Goal
SIDA	Swedish International Development Agency
SIPA	School of International and Public Affairs
SME	Small and Medium-Sized Enterprise
SMEDA	Support to SME Development in Armenia
STC	Science and Technology Convergence
STEM	Science, Technology, Engineering, and Mathematics
STEP	Science and Technology Entrepreneurship Programme
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TPQI	Trade Promotion and Quality Infrastructure
TRIPS	Trade-Related Aspects of Intellectual Property Rights
TUM	Technical University of Moldova
TV	Television

Abbreviation	Full name
UCU	Ukrainian Catholic University
UFAR	Fondation Université Française en Arménie
UG	University of Georgia
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNITER	Ukraine National Initiative to Enhance Reforms
US	United States
USAID	United States Agency for International Development
USD	United States Dollars
USMAC	US Market Access Centre
USSR	Union of Soviet Socialist Republics
UTM	University of Moldova
UVCA	Ukrainian Venture Capital and Private Equity Association
VAT	Value Added Tax
VC	Venture Capital
VTC	Vanadzor Technology Center
WB	World Bank
WIPO	World Intellectual Property Organisation
WNISEF	Western NIS Enterprise Fund
YSU	Yerevan State University

Chapter 1: About This Study

1.1 Introduction

This guide of the ICT entrepreneurial ecosystems in the Eastern partner countries (maturity analysis and recommendations) is developed under the regional EU4Digital facility of the European Union, within the thematic area of ICT Innovation.

The objective of this document is to assess the maturity of the ICT entrepreneurial ecosystems of the Eastern partner countries (Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine) and to provide the recommendations for ecosystem growth.

This guide is designed for the capacity builders i.e. local policymakers (governmental institutions), international organisations (Delegations of the European Union, among others), aid agencies and international financial institutions.

This guide provides information on the following topics:

- Definition of the ICT entrepreneurial ecosystems: Mission and main stakeholders (actors).
- Maturity of the ICT entrepreneurial ecosystems: Assessment of the ecosystem stakeholders' performance in the six Eastern partner countries.
- Recommendations for the ICT entrepreneurial ecosystem building: Recommendations for ecosystem support, their mapping and prioritisation for the six Eastern partner countries[1]. The suggested recommendations in this document apply to any ICT entrepreneurial ecosystem.

1.2. Methodology and acknowledgements

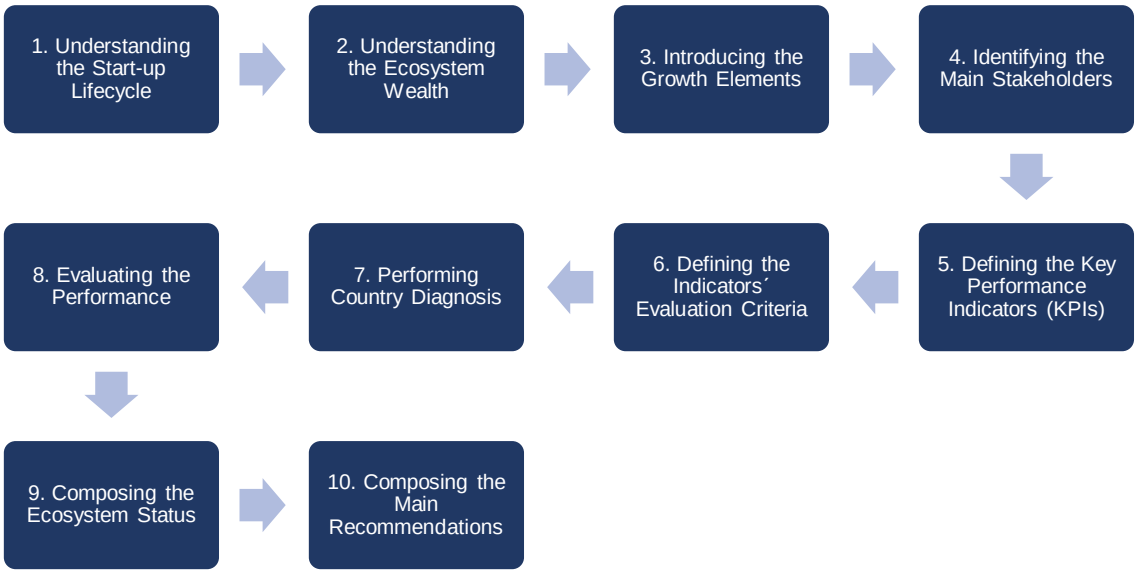
Since no standard methodology to evaluate an ICT entrepreneurial ecosystem's capacity is universally used, nor does it cover all aspects of ecosystem building across the start-up's lifecycle, the experts have applied a custom methodology for evaluating the maturity of the ICT entrepreneurial ecosystems and the performance of their stakeholders. The methodology was defined based on the objective of offering concrete recommendations and practical actions for the ecosystem´s growth. It is based on several **assumptions**:

1. The primary goal of the ICT entrepreneurial ecosystem is to have the capacity to generate highly profitable start-ups. Those highly profitable start-ups should re-invest their profits and human capacity to new start-ups.
2. Start-up's lifecycle goes from an idea to profits through different growth stages: idea stage, pre-seed stage, seed stage, early stage and scale-up.
3. The conversion ratios of the ICT entrepreneurial ecosystem start-ups growing from one stage to another are calculated to measure the ecosystem wealth. Conversion ratios of start-ups can be considered a common standard at the international level to evaluate the wealth of the entrepreneurial ecosystems.
4. The essence of the ICT entrepreneurial ecosystem is to guide the start-ups from business ideas to profits by supporting their growth through offering access to business knowledge, capital, market, and resources during the different growth stages of the start-up´s.
5. Different stakeholders compose and influence the development of the ICT entrepreneurial ecosystem:
    - Educators: Offering start-ups access to knowledge.
    - Investors: Offering start-ups access to capital.
    - Connectors: Offering start-ups access to market.
    - Facilitators: Offering start-ups access to resources.

[1] The suggested recommendations in this guide apply to any ICT entrepreneurial ecosystem. To make it practically adopted for the six Eastern partner countries, the recommendations are prioritised based on each country's maturity level (priorities), implementation complexity and available resources.

The methodology consists of connecting the steps followed by experts in the ICT entrepreneurial ecosystems evaluation process. The logical flow of the methodology is presented in the figure below.

Figure 1. Methodology for the ICT entrepreneurial ecosystem performance evaluation



Step 1. Understanding the start-up lifecycle

The experts first defined the start-up lifecycle to illustrate the development process of a start-up and growth throughout the respective stages from idea to profits. The experts applied a qualitative approach to describe the process of detecting and leading entrepreneurial talent through the respective phases from the idea stage, pre-seed stage, seed stage, early stage to scale-up. The explanations were based on the personal experience of the experts within the ICT ecosystem – stemming from years of activities conducted in the fields of start-up development, acceleration, incubation, and capacity building in both regional and European markets (*see Chapter 2.3.*).

Step 2. Understanding the ecosystem wealth

After defining start-ups and their growth stages, the experts explain how the ecosystem's wealth can be understood and evaluated by analysing the conversion rates of start-ups from one stage to another. To define these estimations, the experts used the information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries" and the largest ICT entrepreneurial databases - Dealroom and CrunchBase (*see Chapter 2.4.*).

The experts detailed the conversion ratios of start-ups in the EaP countries and performed a benchmark with selected countries in East-Central and Western Europe, and top mature ecosystems such as Israel or California (Silicon Valley) (*see Chapter 10*).

Step 3. Introducing the growth elements

To understand the reasons that explain the conversion rates, the experts introduced the essential growth elements that the ICT entrepreneurial ecosystem must provide to the start-ups to ensure their growth capacity (*see Chapter 2.5.*).

The experts have outlined the following essential elements:

1. Business knowledge.
2. Capital.
3. Market.
4. Resources (technological and business).

Step 4. Identifying the main stakeholders

After introducing the growth elements, the experts introduce the main stakeholders of the ecosystem, such as the educators, investors, connectors and facilitators responsible for offering the growth elements (knowledge, capital, market and resources) to the start-ups (*see Chapter 2.5.*).

Although the governments and public entities, such as international organizations or aid agencies, were analysed as far as their assistance in strengthening the ecosystem is concerned, they have not been evaluated. The experts mention in the diagnoses the main activities of these entities as educators, investors, connectors and facilitators, and their main role as regulators.

Step 5. Defining the key performance indicators

To evaluate the performance of the main stakeholders, the experts define ten KPIs with 19 indicators based on the type of stakeholder (educator, investor, connector or facilitator), including the stage of the start-up which the stakeholder is impacting (idea stage, pre-seed stage, seed-stage and early-stage) (*see Chapter 3*).

Step 6. Defining the indicators´ evaluation criteria

In order to proceed with the diagnosis of each indicator, the experts define a total of 51 evaluation criteria (*see Annex 1: Indicator´s evaluation criteria*), grouped into two typologies:

1. **Qualitative criteria**: Criteria that offer general and specific information on each type of stakeholder's situation and performance.
2. **Quantitative criteria**: Criteria that quantify the required information. To evaluate the quantitative data, the experts compare data of the EaP countries with countries that share similarities such as education, industry, culture and population in several East-Central European countries - Estonia, Lithuania, Bulgaria, Poland and Romania.

Step 7. Performing country diagnosis

The experts performed a diagnosis on the performance of the ICT entrepreneurial ecosystem main stakeholders by evaluating indicators. For the analysis, the required information was gathered according to the designed qualitative and quantitative criteria. The experts had access to multiple sources, such as online interviews with the main actors of the ICT entrepreneurial ecosystems, questionnaires, public sources, and preliminary analysis performed by the EU4Digital Facility[2] to get the required information. The diagnoses were performed at the country level.

Step 8. Evaluating the country status

After diagnosing the performance of the ICT entrepreneurial ecosystem main stakeholders, the experts evaluated the performance of each stakeholder at five levels:

1. **Non-existent**: The referred stakeholders are non-existent in the ecosystem.
2. **On performance**: The referred stakeholders are offering limited access to the ecosystem growth elements.
3. **Acceptable performance**: The referred stakeholders are meeting the demand for the ecosystem´s required growth elements.
4. **Optimal performance**: The referred stakeholders perform at the same level as stakeholders of the selected East-Central European countries.
5. **Excellent performance**: The referred stakeholders perform at a more optimal level than stakeholders of the selected East-Central European countries.

Step 9. Composing the ecosystem status

The status of the ecosystem was reflected in the map that shows the performance of the main ecosystem stakeholders according to 19 defined indicators throughout different stages of the start-up lifecycle. A status map is composed for each of the six EaP countries separately and provides a holistic overview of the ecosystem indicating

[2] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".

strengths and areas for improvement. Furthermore, any improvement should be planned and implemented in a coordinated manner in order to avoid any negative impact on ecosystem wealth and performance.

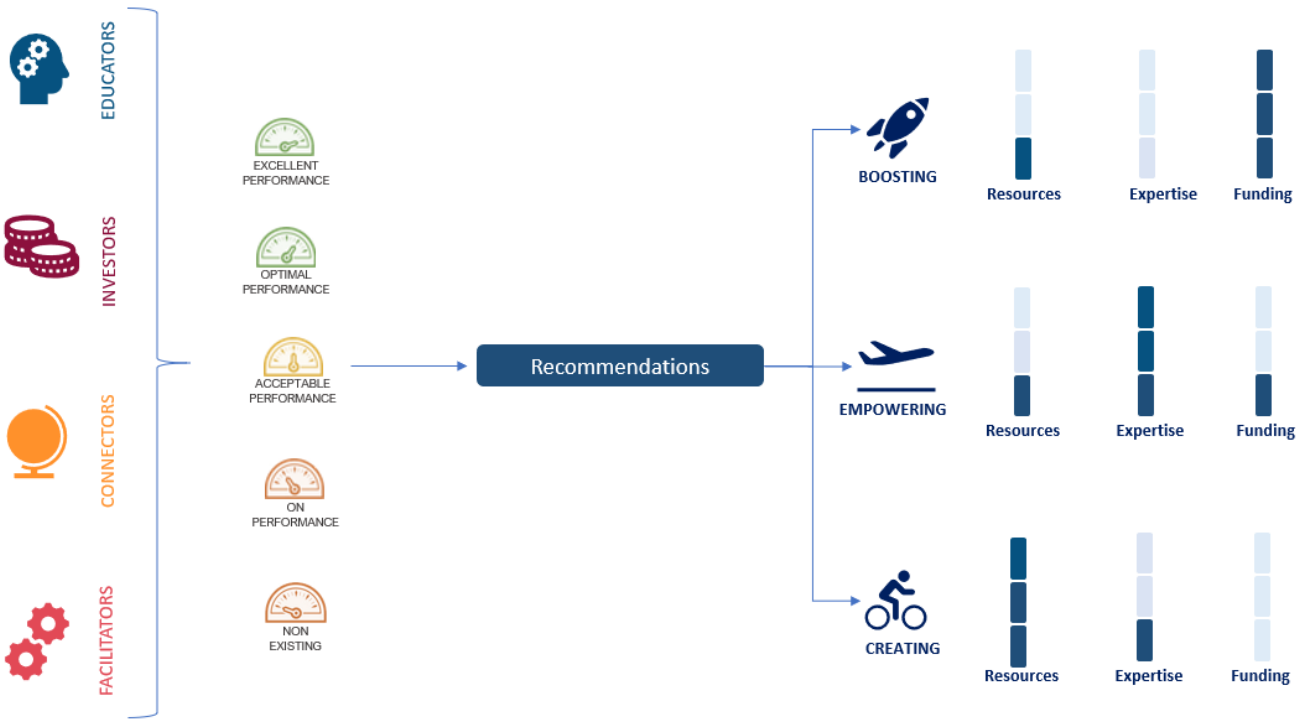
Step 10. Composing the main recommendations

In the final step, a total of 41 recommendations were composed and prioritised taking into account the level of performance of the stakeholders *(see Chapter 11)*.

The main objective of the recommendations is to boost the growth of the entrepreneurial ecosystem by empowering its stakeholders, for which the recommendations are grouped into three categories (*also see figure below)*:

1. **"Creating the stakeholders" recommendations:** When the evaluation level is "Non-existent", the category of the recommendation is "Creating". The recommendations of "Creating" type propose specific activities to create and make sustainable non-existent actors in the ecosystem.
2. **"Empowering the stakeholders" recommendations:** When the evaluation levels are "On performance" and "Acceptable performance", the category of the recommendation is "Empowering". The recommendations of the "Empowering" type propose specific activities to support the sustainability of the ecosystem's stakeholders.
3. **"Boosting the stakeholders" recommendations** When the evaluation levels are "Optimal performance" and "Excellent performance", the category of the recommendation is "Boosting". The recommendations of the "Boosting" type propose specific activities to support the growth of the ecosystem stakeholders.

Figure 2. The grouping of recommendations for the ICT entrepreneurial ecosystem improvement



In addition, each recommendation is composed of the following elements:

- **Title**: Name of recommendation.
- **Area**: Resource that the recommendation impacts (knowledge, capital, market and resources).
- **Target**: Type of stakeholders targeted by recommendation (educators, investors, connectors and facilitators).
- **Implementer**: Type of capacity builder responsible for the implementation of the recommendation.

- **Executor**: Type of entity responsible for executing the activities of the recommendation.
- **Related indicator**: Performance indicator that defines the recommendation.
- **Actions**: Concrete actions necessary to implement the recommendation.
- **Complexity**: Different types of resources (budget, timing, set-up budget, operational budget) and their complexity level that is required to implement the recommendation. Each resource is evaluated on a five-level scale of the complexity of implementation, ranging from “Very Low” to “Very High”. Also, the amount and implementation period of each resource is estimated, where applicable.

In the end, the experts prioritised and indicated the most necessary and impactful recommendations for the growth of the ICT entrepreneurial ecosystem at the country level.

1.3. The team

This guide has been composed of a group of experts who have extensive knowledge in investment funds, investment processes in tech start-ups, entrepreneurial ecosystems building and strategy consulting.

A central team developed the guidebook with support from the local country research teams.

The guidebook leader and key senior expert was **Jesús Lozano.**

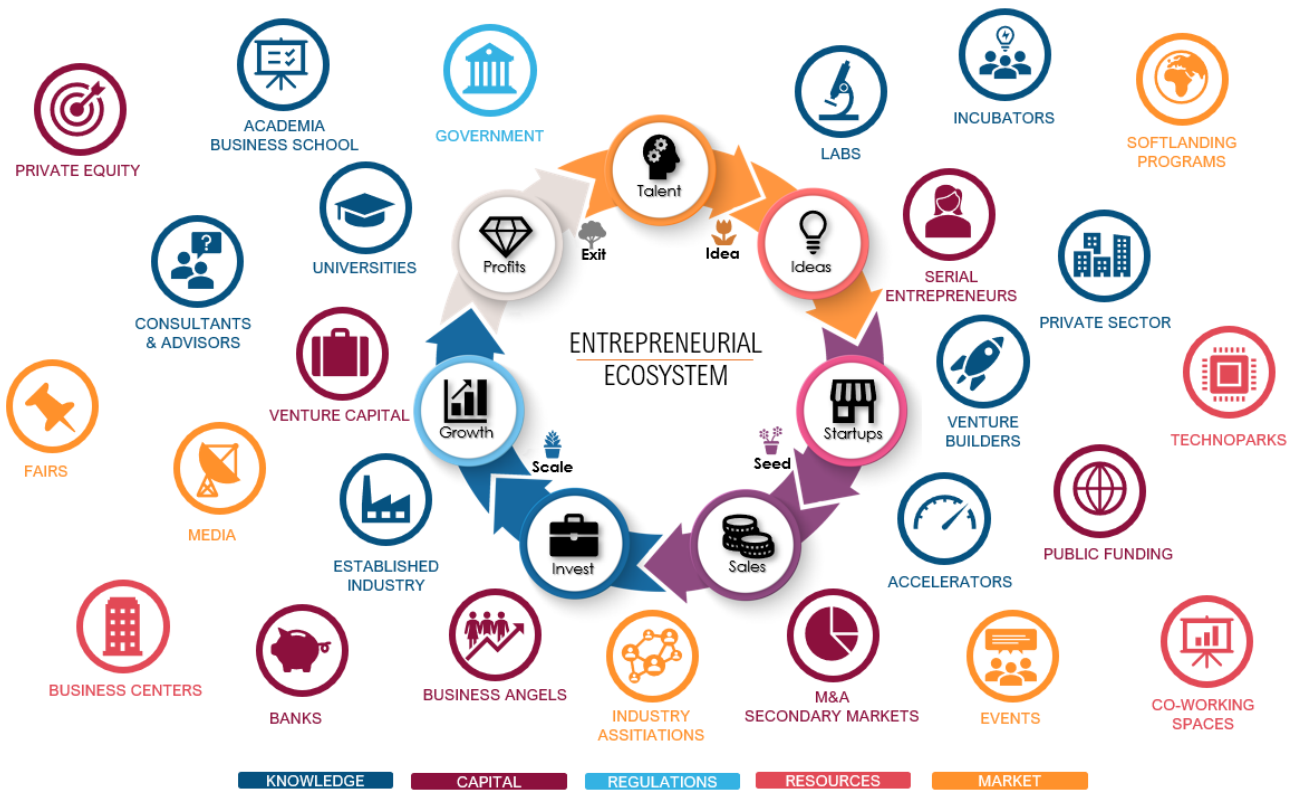
Central team: Arusyak Khudaverdyan, Hayk Mnatsakanian, Artūras Piliponis, Rūta Šalvytė-Tamošiūnienė, Daiva Kulesza.

Local country research teams: Azerbaijan - Agahuseyn Ahmadov; Belarus - Amir Al-Haidar; Georgia - Nino Esakia; Moldova - Ionela Titerez; Ukraine – Daryna Lisichenok and Oleksiy Shmuratko.

Chapter 2: Understanding the ICT Entrepreneurial Ecosystems

An “Entrepreneurial ecosystem” can be defined as the union of public and private entities, within a local, national or international scope, that **joins efforts to promote the creation of new companies and ensure their success**, by offering them **access to knowledge, capital, market and resources**, so that these highly profitable companies will invest their profits in the same ecosystem, thus creating economic wealth and boosting industry *(see figure below).*

Figure 3. ICT entrepreneurial ecosystems stakeholders



2.1. The anatomy of an entrepreneur

Before proceeding with the ICT entrepreneurial ecosystem analysis, a good definition of an entrepreneur is given below:

An entrepreneur is an individual who creates a new company, taking a high financial risk. The entrepreneur is generally seen as an innovator, a source of new ideas, goods, services and business models. They are the individuals who take control of their responsibilities in a company and the responsibility for the business's success.

All successful entrepreneurs, regardless of the sector, have some primary soft skills in common:

- **Decision maker**: Good entrepreneurs have the capacity of the responsibility and courage to make decisions. They are leaders who demand and analyse information to make the correct decisions.
- **Customer-oriented**: One of the main reasons companies fail is that they have products or services for which there is no demand. This often happens because the entrepreneurs have a product-oriented and not customer-oriented mindset. Promising entrepreneurs first understand the potential clients´ challenges and needs and then look or adapt their products or services accordingly.
- **Problem solver**: The entrepreneurs starting a new business face a significant number of challenges. Promising entrepreneurs accept problems with intelligence and humility, acting first and learning after. These entrepreneurs are looking for solutions rather than blaming the failure on other people's underperformance.

- **Hard worker**: The beginning of a company means to work with a lack of resources, mainly human capital. Entrepreneurs are forced to perform many tasks of a very different nature, namely sales, financial, logistics, etc. The lack of specialised resources requires entrepreneurs to spend long hours working on their own in order to be able to see the first results and company growth.
- **Creative**: An entrepreneur must be a person with a creative capacity that helps them make quick decisions to take advantage of opportunities and face challenges.
- **Entrepreneurial attitude**: The attitude is what distinguishes the best from the less successful entrepreneur. Promising entrepreneurs have a positive and inspiring attitude, appreciate the successes and learn from the failures. Promising entrepreneurs see problems as merely circumstantial obstacles that need to be solved.

Promoting entrepreneurship can have a different and positive impact on the economy and society:

- **Entrepreneurs create new businesses**: They invent goods and services, resulting in employment, which often has a domino effect, resulting in more economic development.
- **Entrepreneurs add value to the national income**: Existing companies may remain limited to their markets and eventually reach an income ceiling. However, new products or technologies create new markets and new wealth. Moreover, the increase in employment and higher profits contributes to a nation's tax base, allowing government spending on public projects.
- **Entrepreneurs create social change**: They break tradition with unique inventions that reduce dependence on existing methods and systems, sometimes making them obsolete. Smartphones and their applications, for example, have revolutionised work and people's lives around the world.
- **Entrepreneurs invest in their ecosystem** and support new entrepreneurs in their beginnings with multiple resources, such as mentors or investors.

2.2. The mission of an entrepreneurial ecosystem

The entrepreneurial ICT ecosystems are mainly focused on innovations, generating new business models, products and services, in addition to creating more competitive and efficient markets and improving the customer experience.

These ecosystems - driven by governments, entrepreneurs, foundations and educational institutions, and mainly the private sector - demonstrate that they can create a more dynamic economy by attracting ambitious and talented entrepreneurs, by generating creative thinking environments and entrepreneurial activities.

There are several key factors that foster ecosystem growth and capacity:

1. **Density** as a pole of attraction. Ecosystems are generally concentrated around their primary industries, typically in large cities, except for the agricultural or livestock sectors, which are concentrated in rural areas. It must be understood that this is not about the number of people or companies that are operating in the country, but about how close and interconnected they are. Density attracts talent, investment, aid, and research.
2. **Availability of investment**. An ecosystem must be a meeting point where money flows, both from public and private funds. The higher the investment capacity, the higher the ability to generate knowledge, Research and Development (R&D), networking and maturity.
3. **Industry maturity**. The maturity of an ecosystem refers to the stage of development of companies, as well as the experience of entrepreneurs and employees. The generation of companies with high profits, as well as the “exit” generated in mergers and acquisitions, make these entrepreneurs return to the market, either as entrepreneurs with higher capacity for success or as investors.
4. **Specialised talent**. It has to do with the availability of people trained and specialised in companies, not just employees, but also support staff (lawyers, managers, mentors and advisors, among others).
5. **Education.** There is a culture of support for innovation and entrepreneurial values in the most mature ecosystems across all social stages, and a great deal of connectedness between universities and newly created companies.

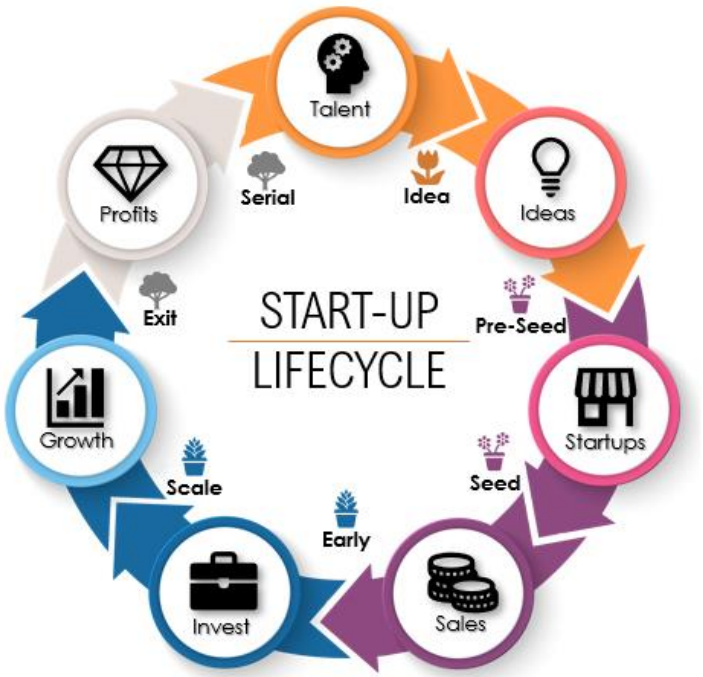
6. **Friendly environment**. Understood as facilities for business creation, tax incentive policies, investment aid, workplaces, etc. An ecosystem must strengthen the population and institutions' entrepreneurial attitude and culture.

We can then declare that an entrepreneurial ecosystem's primary mission is to unite all the resources that allow entrepreneurs to face all stages from their business “Idea” to the generation of “Profits”.

2.3. The start-up lifecycle

To understand the resources and elements that an ecosystem must offer to its entrepreneurs, we must understand the different steps from the “Idea” to the “Profit” stage, for which we can use the following graph *(see figure below)*.

Figure 4. Start-up lifecycle, from the talent to profits

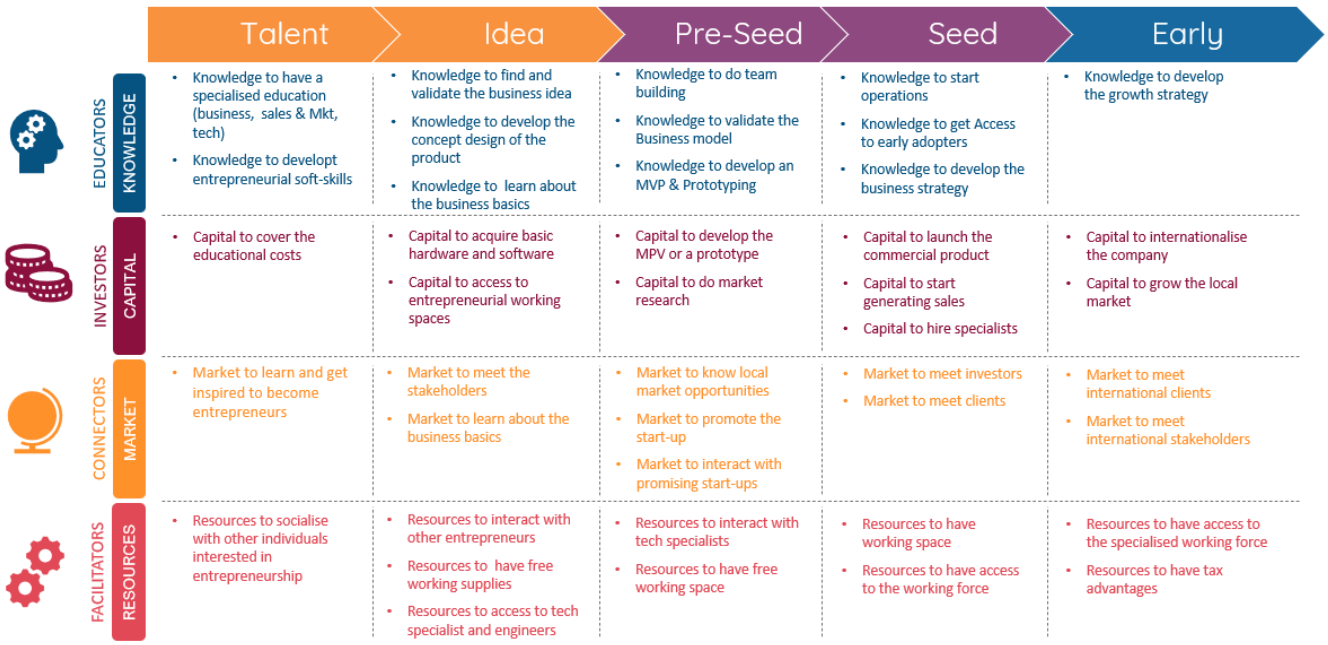


1. **Talent**: The actors' first mission in an ecosystem is to detect talented entrepreneurs—individuals with the soft skills described previously, ready to execute and transform viable business ideas into highly profitable companies.
2. **Idea:** Talented people need to find viable sources of business ideas. This is important in ecosystems where entrepreneurs are young, with little experience on the labour market, and little experience detecting a business need.
3. **Start-ups**: Talent with viable ideas, generates new companies. In this phase, the ecosystem actors must support the creation of work teams and the development of business strategies that the entrepreneur will face in the short and medium-term.
4. **Sales**: Companies, with reliable and multidisciplinary teams begin to generate sales. In this phase, ecosystem actors must support companies in making sales by connecting them to future markets and customers.
5. **Investment**: The companies that generate sales demonstrate that both the entrepreneurial team and the product, as well as the business model, are correctly validated, and this attracts the interest of investors.
6. **Growth**: Companies that have investment generate expansion and growth. In this phase, the ecosystem actors must support the entry of companies into new markets through their internationalisation.
7. **Profits**: Companies that have escalated into markets and sales generate profits for entrepreneurs, either through sales or through the sale of the company via mergers and acquisitions. These entrepreneurs have gone from being simple, talented people to expert entrepreneurs who will reinvest their profits in the same ecosystem, either by creating new, more dominant companies or by investing in other entrepreneurs.

Each of the growth phases takes place in stages, which are broken down into the idea stage, pre-seed stage, seed stage, early stage, and scale-up from talent to profit.

From the idea stage to scale-up, start-ups always have the same primary objectives. These stages are crucial for the start-up's success. The stakeholders of the ecosystem act with the most intensity by offering the resources that the entrepreneurs and start-ups need: business knowledge, capital, market & business environment, resources and regulations (*see figure below)*.

Figure 5. Primary objectives per start-up growth stage



During the **"Idea stage"**, the primary mission of the entrepreneur is to validate the idea of minimising risks, using "lean" methodology concepts, through interviews with future clients, analysis of entry into a large market, design of a competitive product in the market, and to have a clear and attractive value proposition. On the other hand, two key factors are developed: the creation of a team of entrepreneurs and a personal financial plan.

During the "**Pre-seed stage**", the entrepreneurs' main objective is to validate their business models through the proof of concept of their prototypes and minimum viable products (MVP) with future clients.

During the "**Seed stage**", a commercial product is created, with which the first customers are obtained. During this phase, the strategy of customer acquisition, acquisition costs, average customer life, average income, etc. allow entrepreneurs to create a viable business plan that helps to chart the growth strategy.

During the "**Early stage**", the start-up's principal objective is to consolidate as a company reaching the breakeven point, between sales and costs, mainly in local markets.

As a "**Scale-up**", the primary mission is to increase revenues and generate profits. Essential tasks are developed, such as growing in existing markets with new products or services, establishing alliances with international partners and accessing new markets.

2.4. Generating a mature and wealthy ecosystem

If we consider that the main objective of an ecosystem is to generate highly profitable companies, then analysing their maturity is as simple as knowing the conversion ratios (in percentages) of the start-ups from one stage to another, mainly from pre-seed to scale-up.

To evaluate the performance of the conversion ratios in an entrepreneurial ecosystem, we must compare the ratios with ecosystems from regions with the same similarities detailed in chapter 2.2., like density, availability of investment, industry maturity, specialised talent, education and friendly environment.

In this specific case, in order to evaluate the maturity of the ICT entrepreneurial ecosystems of the Eastern Partner countries - Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine, the experts have selected similar East-Central European countries in terms of ecosystem size and maturity, and IT specialisations. Considering that, the following countries have been selected for comparison: Lithuania, Estonia, Poland, Bulgaria and Romania (*see figure below*).

Figure 6. Conversion ratios from pre-seed stage to exits

	Pre-Seed	Seed	Early	Scaling	Exits
California	22,23%	4,89%	2,43%	0,68%	
Israel	23,21%	6,11%	3,66%	0,72%	
West Europe	15,94%	4,66%	1,47%	0,59%	
Lithuania	14,23%	4,84%	0,79%	0,30%	
Estonia	12,49%	4,96%	0,53%	0,14%	
Poland	11,91%	3,21%	1,25%	0,27%	
Bulgaria	12,26%	4,56%	0,28%	0,11%	
Romania	11,79%	3,64%	0,35%	0,14%	
East-Central Europe	**12,56%**	**4,24%**	**0,64%**	**0,19%**	

To extract the conversion ratios of the selected countries, the experts had access to the information in the document EU4Dgital Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, as well as the open public data sources CrunchBase and Dealroom, where the experts estimate that the number of registered start-ups and investment operations is enough to calculate the conversion rates.

2.5. The elements of an ICT entrepreneurial ecosystem

Entrepreneurial ecosystems are fundamental for fostering the type of industry and innovation needed to make markets more efficient.

Establishing and fostering an entrepreneurial ecosystem is difficult given the level of sustained collaboration needed among governments, educational institutions, the private sector, and entrepreneurs. For an entrepreneurial ecosystem to work, it is imperative that participants clearly understand their role, as well as the benefits that can derive from their participation.

1. **Governments** must implement and enforce policies, providing a regulatory environment that facilitates the development of the ecosystem. Doing so fosters business activity and the hiring of professional and industrial services, while improving the country's overall competitiveness.
2. **Financial institutions**, including international and local banks, private equity funds and venture capital funds, should bring deep market expertise to the ecosystem.
3. **The private sector** can also stimulate its innovation by establishing alliances with enterprises and start-ups born in the ecosystem. These partnerships can strengthen the new companies' competitive position, for example, by reducing the time it takes to market their latest products and services.
4. **Entrepreneurs** provide innovative and often disruptive solutions to the ecosystem. In return, the ecosystem allows entrepreneurs to benefit from greater access to finance and business knowledge and supports the internationalisation to a global market.

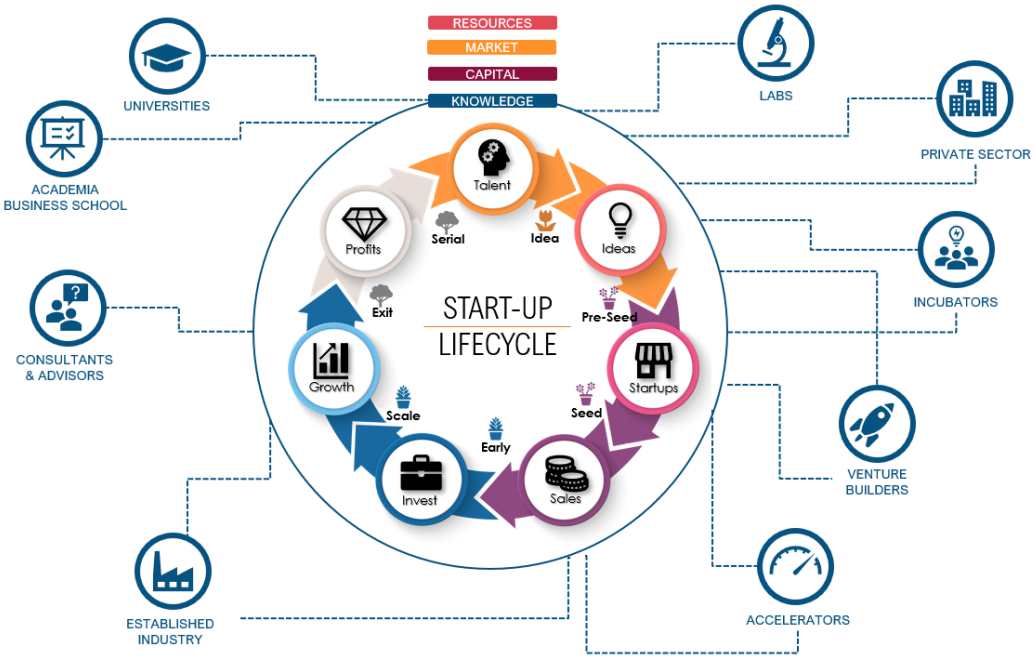
The entrepreneurial ecosystem goes beyond bringing promising ideas to the market and, from the market to the profits. It is about generating innovative high valuable start-ups by interacting with the five elements of ecosystem design (knowledge, capital, market, resources and regulations) and the involvement of multiple stakeholders whose roles are explained in the sub-chapters below.

Access to Knowledge: The Educators

Entrepreneurs may have a very technical background and understand the product they want to market, but are unaware of the excellent management and sales methods.

In developed entrepreneur ecosystems, ecosystem actors provide entrepreneurs with the business knowledge they need, mainly “business idea validation”, “product validation”, "business model validation", "sales strategy", "internationalisation strategy", and "merger and acquisition".

Figure 7. The main actors providing access to knowledge



The primary educators providing access to knowledge are presented in the figure above and their mission is explained below:

UNIVERSITIES

Access to: Knowledge.

Mission: Provide education to generate more talents.

Universities have access to future young entrepreneurs and are responsible for providing the technical and business knowledge necessary to generate talent.

ACADEMIA / BUSINESS SCHOOLS

Access to: Knowledge.

Mission: Provide education to generate more talents.

Business schools and academies have access to students seeking specialisation, mainly in business areas. They can provide business knowledge for technical background entrepreneurs.

LABORATORIES

Access to: Knowledge.

Mission: Provide education to generate more talents.

Laboratories have access to students seeking specialisation, mainly in the area of research and development.

PRIVATE SECTOR

Access to: Knowledge.

Mission: Provide education to validate Ideas and create start-ups.

Private companies are the most significant source of business ideas; given the needs, they must acquire products and services necessary for their growth.

INCUBATORS

Access to: Knowledge.

Mission: Provide education to validate Ideas and create start-ups.

Generally, they are non-profit public entities and attached to educational and/or governmental institutions.

Incubators are usually set in technology parks and universities. their primary mission is to provide support during the idea and seed stages, offering business and technical training courses on “Idea Validation”, “Product Validation” and connecting entrepreneurs to create teams of founders.

VENTURE BUILDERS / ACCELERATORS

Access to: Knowledge.

Mission: Provide education to create start-ups and generate sales.

Accelerators and venture builders are entities that support companies in the very early stages to define their market access strategies and accompany them until the companies start generating sales by connecting with customers and investors. Venture builders also support the idea phase of the company, connecting entrepreneurs with the private sector.

ESTABLISHED INDUSTRY

Access to: Knowledge.

Mission: Provide education to generate sales and foster growth.

The medium and large companies in the sector to which the entrepreneurial ecosystem belongs play a critical role in supporting new companies in their sales generation stages and growth since they become their main clients.

Sometimes, ecosystems are generated in areas where there is no established industry, putting at risk the creation of new companies that do not have access to the market. In these cases, ecosystems must have the capacity to connect entrepreneurs with international markets.

CONSULTANTS / ADVISORS

Access to: Knowledge.

Mission: Provide education to foster growth and generate profit.

The advisors and consultants support companies mainly in their growth and expansion phases, helping them face the main legal, financial and regulatory challenges, and encouraging mergers and acquisitions.

GOVERNMENT AS AN EDUCATOR

Access to: Knowledge.

Mission: Provide education to generate more talents, validate ideas, create start-ups, generate sales and foster growth.

In emerging countries, the government has an educating role in the ecosystem, mainly by promoting the creation of educators as stakeholders, but also by offering programmes to entrepreneurs and start-ups such as business training, or facilitating access to mentors, consultants, technical specialists and service providers, including lawyers, accounting, marketing, human resources, etc.

Access to Capital: The Investors

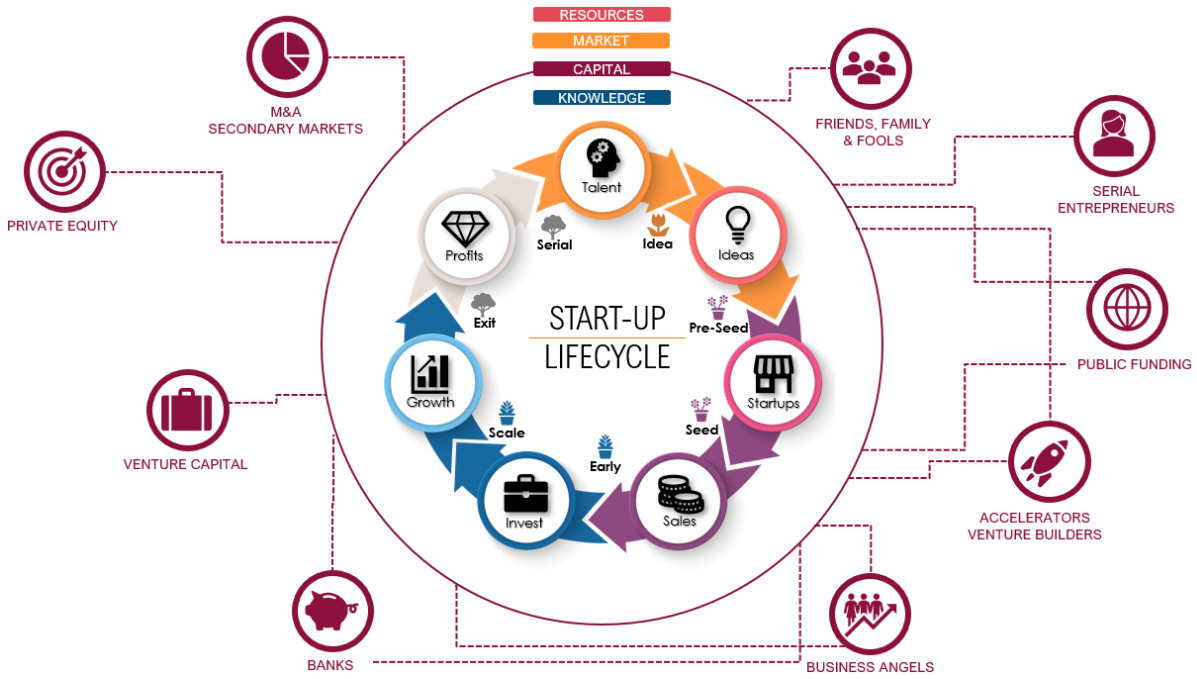
The growth of start-ups largely depends on the investment capacity of the ecosystem. At each stage of its development, a company may need capital to go from one state to the next.

Governments and/or public entities such as international organisations, development banks, foundations, and NGOs can finance the establishment of the companies through the provision of seed funding, grants or interest-free subsidies. They can also provide initial financial support to venture capital funds or private equity funds, banks and incubators to encourage investment in small start-ups.

Venture capital funds and private equity funds are traditional investors in sectorial enterprises. The creation of new funds and their participation will typically increase as these business models gain momentum and reach a critical mass.

Accelerators prepare businesses for access to markets, venture capital funds, provide small investments, and provide financial and due diligence services to entrepreneurs, becoming a one-stop-shop for buyers and sellers in the ecosystem.

Figure 8. The main actors providing access to capital



The main actors providing access to capital are presented in the figure above, and their mission is explained below:

FRIENDS, FAMILY AND FOOLS (FFF)

Access to: Capital.

Mission: Invest in talents.

The first investment of entrepreneurs in the idea phase is required to help them face the early months of their stage as entrepreneurs. In the idea stages, the risk of failure is exceptionally high, so the entrepreneur usually obtains the necessary capital from their savings, trusted people (friends and family), and potential entrepreneurs in the sector. These investors tend to opt for low stakes in the companies created.

SERIAL ENTREPRENEURS

Access to: Capital.

Mission: Invest in talents, ideas, and start-ups.

Successful entrepreneurs and entrepreneurs in the sector are the leading investors in both people and ideas, as well as companies in their early stages. Their immense knowledge of the industry, in addition to resources and networks, allows them to reduce the investment risk in the early stages. These investors tend to take a high share in the invested companies.

PUBLIC FUNDING

Access to: Capital.

Mission: Invest in ideas and start-ups.

The public sector provides subsidies in very early stages or high-risk enterprises where traditional investors and banks do not usually enter. Grants in the idea phase are significant, because they generate courage in entrepreneurs to develop their projects and fail in them. They acquire company knowledge, without risking their savings, which allows them to have access to second opportunities.

BUSINESS ANGELS

Access to: Capital.

Mission: Invest in start-ups and sales.

Business angels are professional investors in the sector who actively invest in start-ups. These investors usually join in investor associations, called Business Angels Networks, where they reduce their risk by converging with other investors and improve their opportunities by diversifying their investment in different companies. Business angels usually invest in companies in exchange for small shares.

BANKS

Access to: Capital.

Mission: Invest in sales and growth.

Traditional banking offers companies' investment tools to generate their first sales and offer services to companies in the growth phase. Traditional banking offers mainly business loans, although they also provide grants or loans with advantages in many cases.

VENTURE CAPITAL

Access to: Capital.

Mission: Invest in sales and growth.

Venture capital firms are financial entities that invest in companies with high potential for growth and risk, obtaining participation in the company. Generally, these types of entities invest in innovative, non-traditional sectors, where companies can develop new types of products or innovations that attract the interest of large companies or secondary markets.

PRIVATE EQUITY

Access to: Capital.

Mission: Invest in growth and profit.

Private equity is an investment fund that generally invests in companies with very profitable business models. These entities have an investment capacity, typically much higher than venture capital firms. They usually acquire full ownership of the invested-in company, in order to have greater control over its growth.

M&A / SECONDARY MARKETS (IPO)

Access to: Capital.

Mission: Invest in profit.

Once the companies are mature and generate high capacity for profit, the entrepreneurs can decide to sell part or all of the company, thus making personal wealth re-invest in the ecosystem. To achieve this, they mainly offer their companies to much larger companies in the sector, which may be interested in merging or acquiring the company (M&A). Another option is to allow a large number of small investors to enter by offering the company's shares in secondary markets (IPOs).

GOVERNMENT AS AN INVESTOR

Access to: Capital.

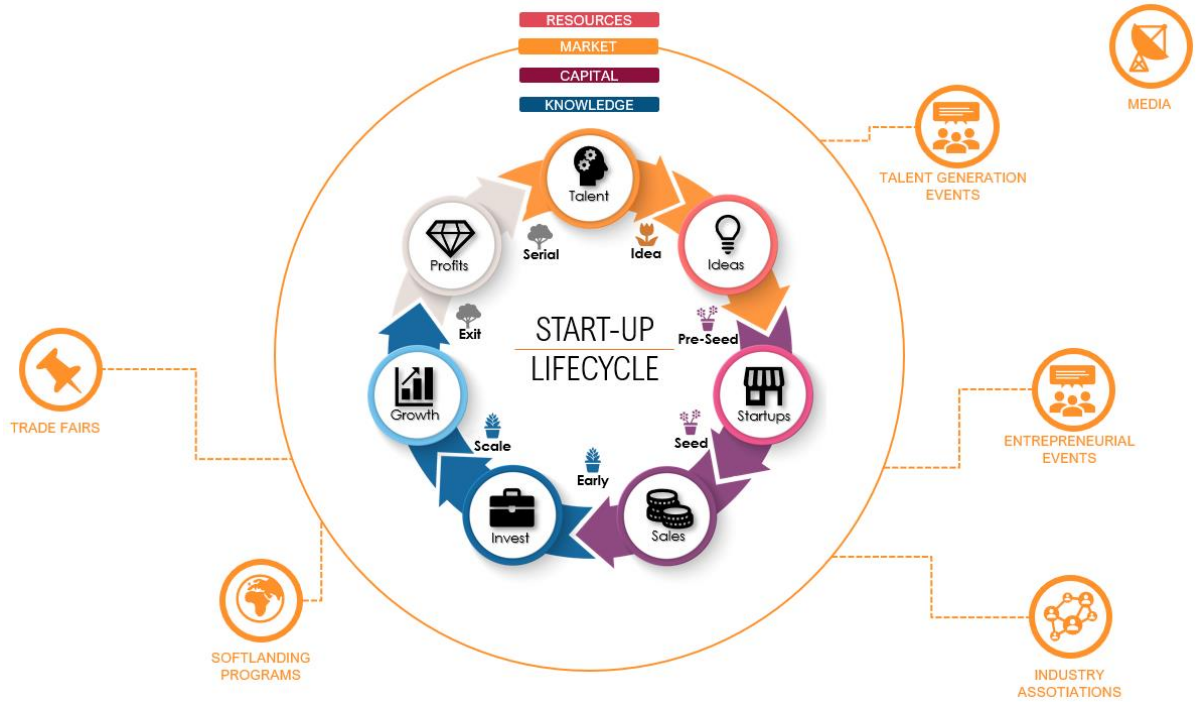
Mission: Invest in talents, ideas, seed stage start-ups, sales and growth.

Governments play an essential investor role in the ecosystem, mainly empowering the local investors through fund of funds or co-investments but also offering access-to-capital programmes to entrepreneurs and start-ups through grant schemes or soft loans.

Access to Market: The Connectors

Entrepreneurial ecosystems must offer entrepreneurs an environment that fosters inspiration, knowledge, coordination and access to the different stakeholders, customers and markets of the sector to which they belong.

Figure 9. The main actors providing access to market



The main actors providing access to market are presented in the figure above, and their mission is explained below:

EVENTS

Access to: Market.

Mission: Support all areas of start-ups development.

Entrepreneur events are essential for inspiring talent to action and supporting companies' growth by connecting them with the private sector and local and international finance. Generally, the events are usually very technical, referring to the industry in question (expos, workshops, etc.), although one can also find public events to encourage entrepreneurship, commonly called "Summits".

MEDIA

Access to: Market.

Mission: Support all areas of start-ups development.

Communication agents are essential for encouraging the creation and growth of companies. The media and social networks offer entrepreneurs access to information of interest, as well as to databases and market information.

INDUSTRY ASSOCIATIONS

Access to: Market.

Mission: Support all areas of start-ups development.

Business associations support the interaction between entrepreneurs and the private sector, both from the ecosystem sector and from other industries interested in the new enterprises' products and services. These associations encourage support to new companies, both by locating market needs and by developing business and sales.

SOFT LANDING PROGRAMMES

Access to: Market.

Mission: Support sales and growth of start-ups.

Soft landing programmes allow entrepreneurs to establish business offices in locations where their clients are located. These programmes are critical in ecosystems where the industry is underdeveloped. Generally, public entities offer funds and connect companies with different, more mature ecosystems to develop their sales, without losing the link with the original ecosystem.

INTERNATIONAL FAIRS

Access to: Market.

Mission: Support growth of start-ups.

When companies are in a phase of growth and internationalisation, international trade fairs for specific sectors are an excellent opportunity for companies to attract new customers, investors and strategic partners. Establishing international festivals in the local ecosystem allows for attracting the attention of foreign entities and companies.

GOVERNMENT AS A CONNECTOR

Access to: Market.

Mission: Support development of talents, ideas, seed stage start-ups, sales and growth.

As a connector, the government plays a fundamental role in the ecosystem players' proper interaction by identifying relevant stakeholders and their direct integration into the ecosystem development process. Besides, the government promotes the ecosystem by encouraging partnerships with the national industry.

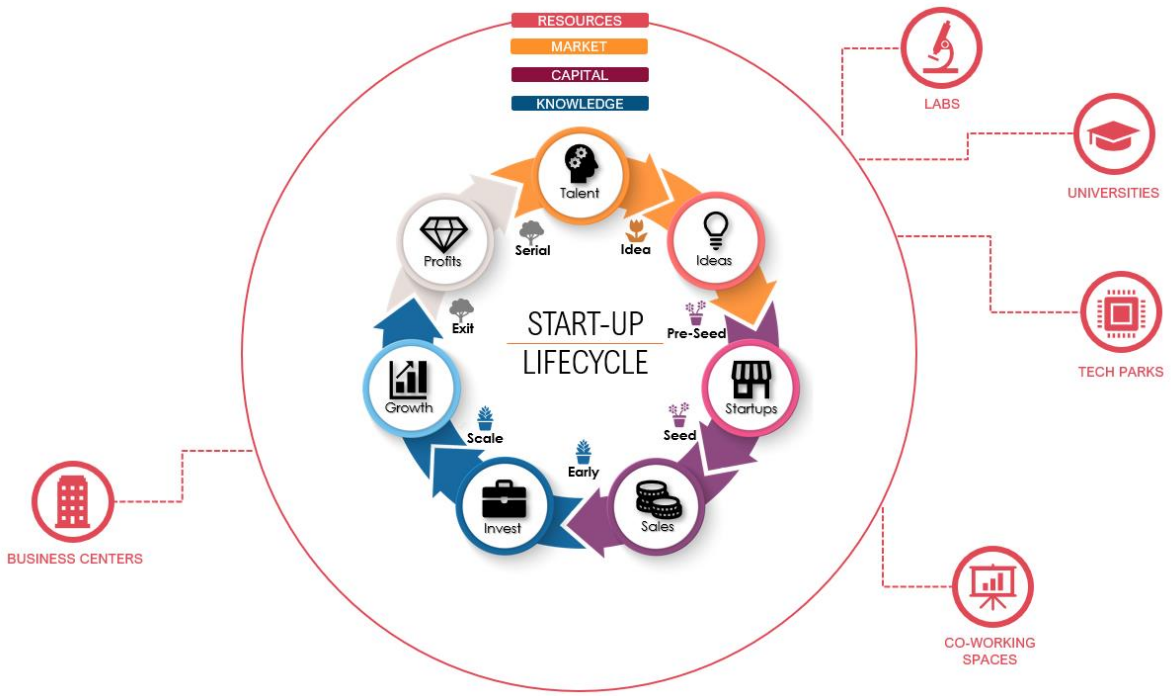
Access to Resources: The Facilitators

Entrepreneurial ecosystems must have **cost advantages to grow**. For example, this means that facilities (buildings), workforce, technologies, and public services must be available and affordable.

Another factor is the **degree of integration and synergies** among the members of the ecosystem. Spaces, where entrepreneurs with similar ideas and business goals come together, facilitate the ecosystem's blooming. These spaces currently promote skilled labour availability, but they must also encourage entrepreneurship knowledge and expertise.

Finally, the **quality of the infrastructure** is of utmost importance. This includes the state of physical infrastructure (for example, roads), ecosystem connections (distance to existing business centres and ease of access), access to supplies (electricity, water, telecommunications, etc.) and logistics (providers, wholesalers, etc.).

Figure 10. The main actors providing access to resources



The main actors providing access to resources are presented in the figure above, and their mission is explained below:

UNIVERSITIES / LABORATORIES (LABS)

Access to: Resources.

Mission: Facilitate generation of talents, ideas, and creation seed stage start-ups.

Universities and labs, as research and development centres, provide entrepreneurs in the idea phase access to workspace, tools and technologies that can enable them to develop their product prototypes. This is important in ecosystems of sectors with innovation needs, such as agriculture and health.

TECH PARKS

Access to: Resources.

Mission: Facilitate generation of ideas and seed stage start-ups.

Technology parks, or business centres, in traditional sectors offer newly created companies workspaces, and encourage business development by bringing together in the same space, new companies, private companies, incubators, accelerators and investors.

ESTABLISHED INDUSTRY

Access to: Resources.

Mission: Facilitate generation of seed stage start-ups and sales.

The entrepreneurial ecosystem can support the growth of companies by giving access to products and services that can allow them to start generating sales. Sometimes, some large companies contribute resources to new companies, such as specialists, machinery, workspace, etc.

CO-WORKING SPACES

Access to: Resources.

Mission: Facilitate generation of seed stage start-ups and sales.

Co-working spaces offer new companies the opportunity to rent workspaces with all the physical necessities and services they require for their growth in the initial phases. These co-working spaces usually offer networking to their rented companies by organising events.

BUSINESS CENTRES

Access to: Resources.

Mission: Facilitate generation of sales and foster growth.

Business centres are entities that offer companies the rental of highly functional workspaces. Unlike co-working spaces, business centres promote the congregation in the same centre of companies in the growth phase, including service companies and external companies the entrepreneurs would need. It is common practice for expanding companies to set up their international sales offices in a specialised business centre, where they have better access to their clients in the region.

GOVERNMENT AS A FACILITATOR

Access to: Resources.

Mission: Facilitate generation of talents, ideas, seed stage start-ups and sales.

As a facilitator, the government is the primary entity providing the land and physical infrastructure to enable the economic and innovative activity implemented on behalf of the local ecosystems' start-ups. The landowner determines land development rights and conditions, which allow relevant entities to develop the property according to their needs and requirements.

Chapter 3: Key Performance Indicators

The diagnoses performed in the following chapters aim to evaluate the maturity of the different Eastern partner countries' entrepreneurial ICT ecosystems by analysing the performance of the stakeholders that compose those ecosystems. The stakeholder performance analysis leads to conclusions that help prioritise the ecosystem capacity-building recommendations.

The experts developed a unique methodology to carry out the country-level diagnoses (*see* *Chapter 1.2*), since there is no standard methodology that is universally used to evaluate an ICT entrepreneurial ecosystem's capacity building, which also covers all aspects of ecosystem building throughout the start-ups' lifecycle. Most of the ecosystem evaluation methodologies for diagnosing an entrepreneurial ecosystem's maturity are mainly based on the analysis of the micro- and macro-economic indicators.

The diagnosis is developed through a qualitative and quantitative assessment of 19 indicators grouped into ten key ecosystem performance indicators (KPIs). The indicators evaluate the stakeholders´ performance that offers start-ups access to knowledge, capital, market, resources and regulations, according to the start-up's growth stages (*see figure below*).

The analysis' **target groups of stakeholders** are:

- **Educators**: universities, tech educators, incubators, local and international accelerators, mentorship associations, public and private sector, and government.
- **Investors**: public sector, business angels networks, local and international venture capital firms, crowdfunding platforms and government.
- **Connectors**: talent generation events, entrepreneurial events, tech media, investment forums, public and private sector and government.
- **Facilitators**: tech parks, laboratories, co-working spaces and work force.

Figure 11. Indicators evaluating the stakeholders' performance

The KPIs and indicators used in the analysis are listed in the table below and explained in the details afterwards. Each indicator is evaluated through:

1. **Qualitative criteria** that are based on the relevant information about the ecosystem players, investments, programmes, facilities, among others.

2. **Quantitative criteria** that are based on the evaluation of the relevant quantitative information, such as existence of stakeholders (yes/no), the number of stakeholders, average operating period of active stakeholders and their provided services in the country, percentages of activities relevant to the development of the ecosystem that are offered by stakeholders.

Table 2. KPIs measuring the maturity of the ICT entrepreneurial ecosystem

ID	TARGET GROUP	KEY PERFORMANCE INDICATORS
KPI 1	Educators	Performance of the educators in talent generation. Indicators: • Indicator 1.1. The quality of universities´ entrepreneurial education programmes. • Indicator 1.2. The quality of technology education centres giving access to educational specialisation in emerging technologies.
KPI 2	Educators	Performance of the educators from the idea to the pre-seed stage. Indicators: • Indicator 2.1. The quality of the incubators. • Indicator 2.2. The quality of the accelerators. • Indicator 2.3. The existence of international accelerators operating in the country.
KPI 3	Educators	Performance of the educators in the seed stage. Indicators: • Indicator 3.1. The existence of mentorship associations. • Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.
KPI 4	Investors	Performance of the investors from the seed to the early stage. Indicators: • Indicator 4.1. The existence of crowdfunding platforms in the country.
KPI 5	Investors	Performance of the investors from the seed to the early stage. Indicators: • Indicator 5.1. The quality of the local venture capital firms. • Indicator 5.2. The existence of international venture capital firms operating in the country. • Indicator 5.3. The quality of the business angels networks.
KPI 6	Connectors	Performance of the connectors in talent generation. Indicators: • Indicator 6.1. The existence of talent generation events.
KPI 7	Connectors	Performance of the connectors from the idea to the pre-seed stage. Indicators: • Indicator 7.1. The quality of the entrepreneurial events. • Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem.
KPI 8	Connectors	Performance of the connectors from the seed to the early stage. Indicators:

ID	TARGET GROUP	KEY PERFORMANCE INDICATORS
		• Indicator 8.1. The existence of investment forums. • Indicator 8.2. The existence of national trade fairs and business forums.
KPI 9	Facilitators	Performance of the facilitators in the idea stage. Indicators: • Indicator 9.1. The quality of tech facilities to support start-up creation. • Indicator 9.2. The existence of tech facilities to support start-up creation in small urban and rural areas.
KPI 10	Facilitators	Performance of the facilitators from the pre-seed to the early stage. Indicators: • Indicator 10.1. The existence of the business facilities to support start-up development.

The detailed methodology for **KPIs and evaluation criteria of indicators** are provided in Chapter 1., and in Annex 1: Indicators' evaluation criteria.

KPI 1. Performance of the educators in talent generation

This KPI analyses universities' and technological education entities' performance in their objective of offering access to business and technical knowledge to entrepreneurs in the talent generation stage.

Indicator 1.1. The quality of universities' entrepreneurial education programmes.

Universities play a significant role in generating talented entrepreneurs, as they provide education in business fields, such as management, marketing, finance and technology. The educational programmes in entrepreneurship also help future entrepreneurs learn about the necessary business soft skills, such as creativity, making decisions, or solving problems necessary to operate a successful company.

Evaluation criteria:

- The percentage of universities that are offering entrepreneurial education programmes.
- Relevant qualitative data on the universities' performance.

Indicator 1.2. The quality of technology education centres giving access to educational specialisation in emerging technologies.

The quality of technology education programmes is critical for ensuring continuous innovation and specialisation in emerging technologies. These programmes prioritise the development of advanced technical skills, combined with the entrepreneurial mindset required to bring the product to a demanding market.

Evaluation criteria:

- The number of technology education entities per million inhabitants.
- Relevant qualitative data on technology education centres' performance.

KPI 2. Performance of the educators from the idea to the pre-seed stage

This KPI analyses the performance of incubators and accelerators in offering access to business knowledge to entrepreneurs and start-ups from the idea stage to the pre-seed stage.

Indicator 2.1. The quality of the incubators.

Incubation programmes allow start-ups to validate their business idea through "Business Idea Validation" and "Product Viability" pieces of training, in addition to supporting entrepreneurs in the search for co-founders, team building, and the provision of extra benefits, such as free working space and access to tech specialists.

Evaluation criteria:

- The number of incubators per million inhabitants.
- Average operating period of the incubators.
- Relevant qualitative data on incubators' performance.

Indicator 2.2. The quality of the accelerators.

Acceleration programmes play a vital role in the transitional phase of the start-up lifecycle where start-ups are trained to validate their business model and generate first sales throughout the initial incubation and pre-acceleration programmes.

Evaluation criteria:

- The number of accelerators per million inhabitants.
- Average operating period of the accelerators.
- Relevant qualitative data on accelerators' performance.

Indicator 2.3. The existence of international accelerators operating in the country.

The presence of international accelerators in a country allows for the further development of opportunities through the provision of international expertise and a direct prospects for expansion.

Evaluation criteria:

- The existence of international acceleration programmes operating in the country.
- Relevant qualitative data on international accelerations' performance.

KPI 3. Performance of the educators in the seed stage

This KPI analyses mentorship associations and private sector performance in offering access to business knowledge to start-ups in the seed-stage.

Indicator 3.1. The existence of the mentorship associations.

Mentorship associations assemble various ecosystem experts to a network that becomes a point of reference for start-ups. The members of this environment may complement one another in their different areas of expertise.

Evaluation criteria:

- The existence of mentorship associations.
- Relevant qualitative data on mentorship associations performance.

Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

The private sector plays an essential role in entrepreneurs' access to knowledge, either through the direct generation of talented entrepreneurs or through their involvement in the development of incubation and acceleration programmes.

Evaluation criteria:

- The existence of the private sector´s entrepreneurial programmes.
- Relevant qualitative data on the private sectors' entrepreneurial programmes performance.

KPI 4. Performance of the investors from the idea to the pre-seed stage

This KPI analyses the performance of the crowdfunding specialised in IT and its objective of offering access to capital to start-ups in the pre-seed stage.

Indicator 4.1. The existence of crowdfunding platforms in the country.

Crowdfunding platforms offer an alternative funding method through a decentralised approach, attracting small investors and individuals interested and supportive of the start-up business initiatives.

Evaluation criteria:

- The existence of national crowdfunding platforms.
- Relevant qualitative data on national crowdfunding platforms' performance.

KPI 5. Performance of the investors from the seed to the early stage

This KPI analyses the local and international venture capital firms, business angels networks and crowdfunding platforms' performance in offering access to capital to start-ups from the seed-stage to the early-stage.

Indicator 5.1. The quality of the local venture capital firms.

Local venture capital firms provide a direct opportunity to access capital for start-ups on the local market. They play a crucial role in allocating resources, in conducting the proper evaluation of prospects and allowing start-ups to grow at the respective stages of their lifecycle.

Evaluation criteria:

- The number of venture capital firms per million inhabitants.
- The average number of investments per local venture capital firm from 2017 to 2020.
- Average operating period of the local venture capital firms.
- Relevant qualitative data on local venture capital firms' performance.

Indicator 5.2. The existence of international venture capital firms operating in the country.

The presence of international venture capital firms in the country allows for increased funding and potential expansion opportunities to international markets.

Evaluation criteria:

- The existence of international venture capital firms.
- Relevant qualitative data on international venture capital firms' performance.

Indicator 5.3. The quality of the business angels networks (BANs).

BANs are vital players for start-ups in their early development stages. They provide smart financing by offering the start-ups access to clients and networking.

Evaluation criteria:

- The existence of the BANs operating in the country.
- The average number of investments per local BAN from 2017 to 2020.
- Average operating period of the BANs.
- Relevant qualitative data on the BANs' performance.

KPI 6. Performance of the connectors in talent generation

This KPI analyses the performance of the local talent generation events in creating awareness and generating talented entrepreneurs.

Indicator 6.1. The existence of talent generation events.

The objectives of local events are to generate entrepreneurial talent by offering small activities and short entrepreneurial experiences, such as start-up weekend or hackathons, and inspiring individuals to become entrepreneurs.

Evaluation criteria:

- The existence of talent generation events.
- Average operating period of talent generation events.
- Relevant qualitative data on talent generation events' performance.

KPI 7. Performance of the connectors from the idea to the pre-seed stage

This KPI analyses the entrepreneurial events and tech media performance in offering access to market to start-ups from the idea stage to the pre-seed stage.

Indicator 7.1. The quality of the entrepreneurial events.

Entrepreneurial events create an environment for entrepreneurs, start-ups and relevant stakeholders, such as private or public sector representatives, investors and more – to gather in a single location at a specific date, and to establish connections and explore professional networks of business opportunities.

Evaluation criteria:

- The number of entrepreneurial events per year per million inhabitants.
- The average number of attendees per entrepreneurial event.
- Average operating period of entrepreneurial events.
- Relevant qualitative data on entrepreneurial events' performance.

Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem.

Specialised business databases allow for a coordinated and organised exchange of information between private or public sector representatives, investors, entrepreneurs and start-ups from the ecosystem. The media generate awareness in the ecosystem by promoting success stories.

Evaluation criteria:

- The existence of specialised entrepreneurial media and databases.
- The existence of ICT entrepreneurial databases.
- Average operating period of the specialised entrepreneurial media and databases.
- Relevant qualitative data on specialised entrepreneurial media and databases' performance.

KPI 8. Performance of the connectors from the seed to the early stage

This KPI analyses the performance of public sector initiatives, investment and business forums and trade fairs in offering access to market to start-ups from the seed-stage to the early stage.

Indicator 8.1. The existence of the investment forums.

Investment forums are intended to develop relationships between start-ups and investors. Through these forums, investors do networking with other local or international investors and explore the present and future investment opportunities.

Evaluation criteria:

- The existence of investment forums.
- Average operating period of the investment forums.
- Relevant qualitative data on investment forums' performance.

Indicator 8.2. The existence of national trade fairs and business forums.

National trade fairs and business forums help entrepreneurs and business people connect with a vast network of private and public representatives to explore business relations and potential collaborations. For start-ups, such

events notably help identify market penetration opportunities through relevant industrial partners who can support, partner and guide throughout the development process of the given products or services.

Evaluation criteria:

- The existence of national trade fairs and business forums.
- Relevant qualitative data on national trade fairs and business forums' performance.

KPI 9. Performance of the facilitators in the idea stage

This KPI analyses the performance of local and outside facilitators in their objective to support the start-up creation and growth in the idea stage.

Indicator 9.1. The quality of tech facilities to support the start-up creation.

Tech facilities, such a tech parks or universities´ transfer offices, support start-up creation and development by first providing required infrastructural and logistical conditions. Those benefits allow start-ups to evolve in the appropriate environment while gaining access to the needed equipment and expertise.

Evaluation criteria:

- The number of tech facilities per million inhabitants.
- The number of spin-offs created per year.
- Average operating period of the tech facilities.
- Relevant qualitative data on tech facilities' performance.

Indicator 9.2. The existence of tech facilities to support the start-up creation in small urban and rural areas.

The opportunities for start-up creation and development in small urban and rural areas contribute to ensuring equal and decentralised development of the country's ecosystem.

Evaluation criteria:

- The existence of tech facilities in small urban and rural areas.
- Relevant qualitative data on the performance of tech facilities in small urban and rural areas.

KPI 10. Performance of the facilitators from the pre-seed to the early stage

This KPI analyses the local facilitators' and the public sector's performance in offering access to resources to start-ups from the pre-seed stage to the early stage.

Indicator 10.1. The existence of business facilities to support the start-up development.

The existence of business facilities, such as co-working spaces and business centres, should be ensured in the local ecosystem to support start-up growth into a profitable business. These facilities should exist aside from specialised tech facilities, acceleration and incubation spaces, and the required infrastructures and programmes for start-up creation.

Evaluation criteria:

- The existence of co-working spaces and business centres.
- Average operating period of the business facilities.
- Relevant qualitative data on business facilities' performance.

Chapter 4: ARMENIA

The diagnosis of the performance of the ICT entrepreneurial ecosystem stakeholders in Armenia is structured in the following manner:

1. Current status of ICT entrepreneurial ecosystem performance through comparison of the conversion ratios of ICT start-ups in different growth stages with select European and other countries.
2. Diagnosis of the performance of the different ecosystem stakeholders: educators, investors, connectors and facilitators by evaluating 19 indicators *(see Chapter 3).*
3. Prioritisation of the main recommendations for further developing the ICT entrepreneurial ecosystem in Armenia.

The detailed methodology of the diagnosis is provided in Chapter 1.

4.1. Status of the ICT entrepreneurial ecosystem in Armenia

This subchapter provides information on:

1. Start-ups strength, by providing the comparison of the start-ups conversion ratios from the idea stage to the early stage with selected European and other more matured ecosystems.
2. Ecosystems stakeholders' status in the different stages of the start-ups' lifecycle.

To analyse the maturity of the ICT entrepreneurial ecosystem in Armenia, first the strength of the start-ups according to the conversion ratios from the idea stage to the early stage, was compared with the ratios of the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania). These countries have been selected due to relevant similarities with the Eastern partner countries such as ICT ecosystem size, targeted IT industries and their size, historical and cultural development path. In addition, the experts have compared the conversion ratios of the Armenia start-ups with well-developed ecosystems of four selected Western European countries (Germany, France, United Kingdom and Spain), as well as with more mature ecosystems like California (Silicon Valley) and Israel *(see tables below).*

The conversion ratios have been calculated based on the information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries" and the largest ICT entrepreneurial databases Dealroom and CrunchBase. The latter sources provide information on a large number of start-ups and investment rounds to calculate the conversion ratios that are close to reality. However, the reader should bear in mind that the mentioned sources do not provide comprehensive data on all start-ups operating in the compared countries, especially in the idea and pre-seed stages, where start-ups have not yet received investments. Also, these sources do not collect the information on start-ups in the early to scale-up stage that have grown without the need for external investments. Nevertheless, these estimated ratios include a significant sample of companies, allowing to make an assumption about the actual conversion ratios of the start-ups in the country.

The experts have compared the conversion ratios of the Armenian start-ups and other selected countries and the differences are provided in the tables below.

Table 3. Conversion ratios compared with the selected East-Central European countries

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**EAST-CENTRAL EUROPE AVERAGE**	**0,06%**	**12,54%**	**4,24%**	**0,64%**	**0,19%**
1.1	LITHUANIA	0,11%	14,23%	4,84%	0,79%	0,30%
1.2	ESTONIA	0,06%	12,49%	4,96%	0,53%	0,14%
1.3	POLAND	0,04%	11,91%	3,21%	1,25%	0,27%
1.4	BULGARIA	0,05%	12,26%	4,56%	0,28%	0,11%
1.5	ROMANIA	0,04%	11,79%	3,64%	0,36%	0,14%
2	**ARMENIA**	**0,06%**	**5,23%**	**1,10%**	**0,23%**	**0,06%**
2-1	**DIFFERENCE**	**0,00%**	**-58,28%**	**-73,97%**	**-63,62%**	**-69,60%**

Table 4. Conversion ratios compared with the selected Western European countries

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**WESTERN EUROPE AVERAGE**	**0,11%**	**15,94%**	**4,66%**	**1,47%**	**0,59%**
1.1	GERMANY	0,06%	16,60%	5,13%	2,09%	0,79%
1.2	FRANCE	0,06%	15,92%	4,87%	1,93%	0,67%
1.3	UNITED KINGDOM	0,21%	16,23%	5,32%	1,27%	0,63%
1.4	SPAIN	0,10%	15,01%	3,31%	0,58%	0,27%
2	**ARMENIA**	**0,06%**	**5,23%**	**1,10%**	**0,23%**	**0,06%**
2-1	**DIFFERENCE**	**-46,90%**	**-67,19%**	**-76,29%**	**-84,18%**	**-90,12%**

Table 5. Conversion ratios compared with California and Israel

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**CALIFORNIA**	0,73%	22,23%	4,89%	2,43%	0,68%
2	**ISRAEL**	0,26%	23,21%	6,11%	3,66%	0,72%
3	**ARMENIA**	**0,06%**	**5,23%**	**1,10%**	**0,23%**	**0,06%**
3–(1+2)	**DIFFERENCE**	**-94,08%**	**-88,49%**	**-89,96%**	**-96,18%**	**-95,84%**

As illustrated in the tables above, the Armenian start-ups' conversion ratios are significantly lower in almost all stages than the selected East-Central and Western European countries, California and Israel ecosystems. Nevertheless, the conversion ratio of Armenian start-ups from idea stage to the pre-seed stage is equal to the selected Eastern Europe countries conversion ratios due to the similarities of engineering education level.

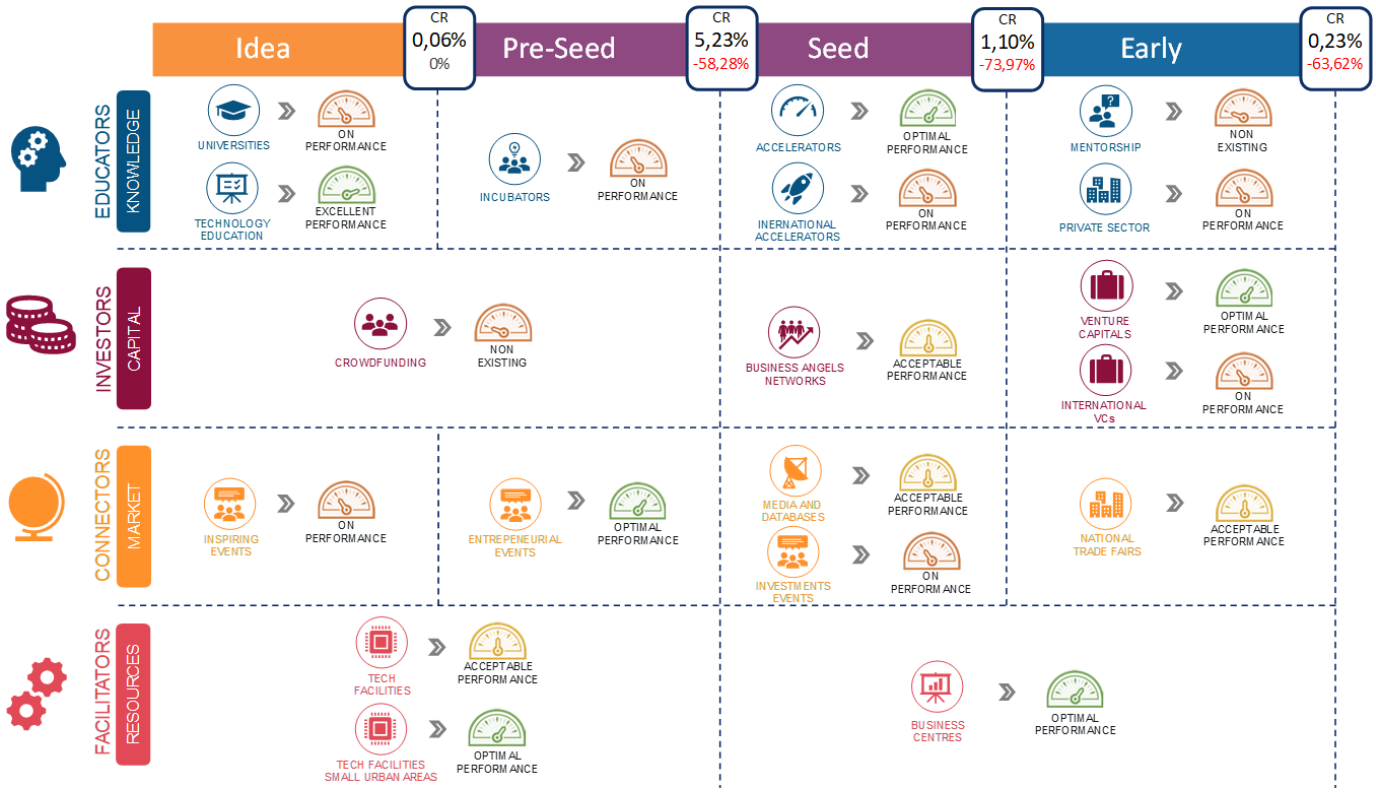
Also, the conversion ratios differences are smaller in the seed stage to yearly stage start-ups meaning that the Armenian ecosystem start-ups have less difficulties to grow internationally.

The conversion ratios are impacted by the ecosystem stakeholders' involvement in start-ups' development and growth. The diagnosis below analyses the performance of those stakeholders that support start-ups' growth from the idea stage to the early stage. Once the start-up becomes a company with international perspectives or scale-up, the local entrepreneurial ecosystem stakeholders relevance is reduced, and start-up growth is ensured by its own resources.

The figure below presents the level of stakeholders performance at each stage of the start-ups' growth. It was developed to offer the reader a clear view of the main strengths and weaknesses of the ICT entrepreneurial ecosystem in Armenia. The figure provides information on:

1. The conversion ratios (CR) of Armenia ecosystem start-ups from idea to early stage.
2. The difference in the Armenian start-ups' conversion ratios compared with the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania) from idea to early stage.
3. The ecosystem status by stakeholder type (from educators to facilitators) and start-up growth stage (from the idea stage to the early stage).

Figure 12. Armenian ICT entrepreneurial ecosystem performance status (CR – conversion ratio)



The performance of the stakeholders at each start-up growth stage are evaluated below.

Idea stage: 0.06% conversion ratio from the idea stage to pre-seed stage

The conversion ratio of the Armenian individuals having a business idea to entrepreneurs creating a start-up in a pre-seed stage is 0,06%. The selected East-Central European countries have the same conversion ratio of the 0,06%. The status of the related stakeholders' performance that are supporting start-ups at the idea stage is provided in the table below.

Table 6. Stakeholders´ performance in the idea stage

#	Indicator	Performance	Explanation
1.	Indicator 1.1. The quality of universities´ entrepreneurial education programmes	*On performance*	The universities' entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 1.2. The quality of technology education centres giving access to specialisation in emerging technologies	*Excellent performance*	The technology education entities offer excellent access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 6.1. The existence of talent generation events	*On performance*	The talent generation events offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 9.1. The quality of the tech facilities to support the start-up creation	*Acceptable performance*	The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 9.2. The existence of the tech facilities to support the start-up creation in small urban and rural areas	*Optimal performance*	The tech facilities in small urban and rural areas offer optimal access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Pre-seed stage: 5,23% conversion ratio from the pre-seed stage to seed stage

The conversion ratio of the Armenian start-ups from the pre-seed stage to the seed stage is 5.23%; the ratio is 58,28% smaller compared to the 12.54% in selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the pre-seed stage is provided in the table below.

Table 7. Stakeholders´ performance in the pre-seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.1. The quality of the incubators	*On performance*	The incubators offer limited access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 4.1. The existence of crowdfunding platforms in the country	*Non-existent*	There are no crowdfunding platforms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the idea stage to the early stage.
3.	Indicator 7.1. The quality of the entrepreneurial events	*Optimal performance*	The entrepreneurial events offer optimal access to the market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Seed stage: 1.10% conversion ratio from the seed stage to early stage

The conversion ratio of the Armenian start-ups from the seed stage to the early stage is 1.10%; the ratio is 73,97% smaller compared to the 4.24% in selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the seed stage is provided in the table below.

Table 8. Stakeholders´ performance in the seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.2. The quality of the accelerators	*Optimal performance*	The accelerators offer optimal access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 2.3. The existence of international accelerators operating in the country	*On performance*	The international accelerators offer limited access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 5.3. The quality of business angels networks	*Acceptable performance*	The business angels networks offer adequate access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem	*Acceptable performance*	The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.1. The existence of investment forums	*On performance*	The investment forums offer limited access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Early stage: 0.23% conversion ratio from the early stage to scale-up

The conversion ratio of the Armenian start-ups from the early stage to scale-up is 0,23%; the ratio is about 63,63% smaller compared to the 0,64% in selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the early stage is provided in the table below.

Table 9. Stakeholders´ performance in the early stage

#	Indicator	Performance	Explanation
1.	Indicator 3.1. The existence of mentorship associations	*Non-existent*	There are no mentorship associations in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the seed stage to the early stage.
2.	Indicator 3.2. The existence of the private sector´s entrepreneurial programmes	*On performance*	The private sector´s entrepreneurial programmes offer limited access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 5.1. The quality of the local venture capital firms	*Optimal performance*	The venture capital firms offer optimal access-to-capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 5.2. The existence of international venture capital firms operating in the country	*On performance*	The international venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.2. The existence of national trade fairs and business forums	*Acceptable performance*	The national trade fairs and business forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
6.	Indicator 10.1. The existence of the business facilities to support the start-up development	*Optimal performance*	The business facilities offer optimal access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

4.2. Diagnosis of the ICT entrepreneurial ecosystem in Armenia

The diagnosis below evaluates the performance of the ICT entrepreneurial ecosystem´s stakeholders' in Armenia such as educators, investors, connectors and facilitators. The evaluation is based on the analysis of 19 indicators graded from 0 to 4 (*see Annex 1: Indicator´s evaluation criteria*). Following that the conclusions on current performance and recommendations for improvement are provided, excluding evaluation of the regulators / public sector performance (*for more explanations see the methodology in Chapter 1*).

KPI 1. Performance of the educators in talent generation

Indicator 1.1. The quality of universities´ entrepreneurial education programmes[3].

According to the country-level assessment, currently, there are 27 state universities and 25 private universities in Armenia. Only six universities (*see table below*) offer specific courses on entrepreneurship and related subjects, like management, marketing, business strategy, and others.

According to the interviewed stakeholders, the Armenian universities' entrepreneurial education programmes need more alignment with the current local and international market-needs to advance from theoretical research problems to applied innovation and entrepreneurship. More practical approaches should be deployed for start-up creation in most universities (e.g., financing, spin-offs, access to international programmes, etc.) for the students to launch a company.

Criteria: The percentage of universities that are offering entrepreneurial education programmes:

- **Grade 1**: The percentage of universities offering entrepreneurial education programmes in Armenia is 11,5% (six out of 52 universities), which is 65% smaller compared to 78% in the selected East-Central Europe countries.

Evaluation of the indicator:

- **On performance**: The universities entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R1. Creating universities´ entrepreneurial programmes.
- **High priority**: R2. Empowering universities by implementing specialised entrepreneurial programmes.
- **Low priority**: R3. Boosting universities by implementing high entrepreneurial education.

Table 10. List of universities offering entrepreneurial education programmes in Armenia

#	Name of university offering entrepreneurial education programmes
1	Yerevan State University
2	Armenian State University of Economics
3	American University of Armenia
4	Russian- Armenian University
5	Armenian National Agrarian University
6	French University in Armenia

[3] Indicator 1.1 considers entrepreneurial education programmes as per standard curricula of universities.

Indicator 1.2. The quality of technology education centres giving access to educational specialisation in emerging technologies.

According to the country-level assessment, being a post-USSR country with a sound focus on engineering and science (a myriad of inventions in military, healthcare, commodity, astrophysics, chemistry, etc.) the country has a strong engineering and tech culture and talent with around 15% of the students studying STEM-related subjects and many scientists.[4] There are ties with international IT companies and EU supported projects on scientific activities, as well as technology labs and tech centres.

There are several technology labs and high-tech educational centres where the engineers can study emerging technologies, like Gyumri Technology Centre (GTC), Vanadzor Technology Centre (VTC), Armenian National Engineering Laboratories (ANEL), TUMO, Armath laboratories which are based in almost every school in Armenia, Children of Armenia Fund (COAF), Engineering City, Microsoft Innovation Centre, and Innovative Solutions and Technologies Centre (ISTC) which is located in the Yerevan State University (YSU) (*see table below*). These centres mostly target youth willing to learn robotics, engineering, and programming. The facilities mentioned are highly modernised, host many events and the students have access to specialists and mentors.

TUMO centres offer a new kind of learning experience for youth through self-learning activities, workshops and project labs. The learning fields cover gaming, animation, filmmaking, motion graphic and many more. The centre's success is proved by international offices in Paris, Berlin, Beirut and Tirana; and other prospect locations.

In Armath engineering laboratories kids aged 10-18 are introduced to science, technology, engineering, and math education through interactive after-school classes, exciting competitions, innovative camps and more. Since 2011, 575 engineering laboratories operate on Armenia and Georgia's territory. Around 15,000 students get free engineering education.

Large IT companies, like Microsoft, CISCO, VOLO, Synopsys, etc. in Armenia, serve as a solid ground of tech learning. Those offer tech training for their personnel, thus increasing the quality tech-workforce number. Microsoft Innovation Centre (MIC) initiates various targeted projects and activities, including training programmes and coding boot camps, to develop a qualified workforce, programmes, targeted at teams and start-ups to support innovative IT products in various spheres. As of now, the centre has trained over 7,500 students.

Criteria: The estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants:

- **Grade 4:** The number of technology education entities per million inhabitants in Armenia is 231,5 from a total number of tech educational facilities of 694, which is 207 centres more compared to an average of 24,4 centres in the selected East-Central European countries[5].

Evaluation of the indicator:

- **Excellent performance**: The technology education entities offer excellent access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R4. Creating technology educational centres.
- **Low priority**: R5. Empowering technology education centres by implementing educational specialisation in emerging technologies.
- **High priority**: R6. Boosting technology education centres by implementing educational specialisation in emerging technologies.
- **High priority**: R7. Boosting technology education centres by funding capacity for R&D development.

[4] Report on the State of the Industry: http://www.eif.am/eng/researches/report-on-the-state-of-the-industry/.
[5] Based on Dealroom and Crunchbase data.

Table 11. List of technology education centres in Armenia

#	Name of technology education centre	Number of centres
1	TUMO	3 centres
2	Armath	Over 575 labs
3	Gyumri Technology Centre	1 centre
4	Engineering City	1 centre
5	Vanadzor Technology Centre	1 centre
6	National Academy of Sciences of Armenia	35 subordinated research institutes
7	Children of Armenia Fund (COAF)	75 labs and 1 smart centre
8	Armenian National Engineering Laboratories (ANEL)	1 centre
9	Microsoft Innovation Centre	1 centre
10	Innovative Solutions and Technologies Centre (ISTC)	1 centre

KPI 2. Performance of the educators from the idea to the pre-seed stage

Indicator 2.1. The quality of the incubators.

According to the country-level assessment, several start-up incubators are paving the way for tech start-ups in Armenia by offering training opportunities in the early stages and co-working spaces. According to the current public information, there are currently three incubators based in Yerevan (*see also table below*):

- Entrepreneurship and Product Innovation Centre (EPIC), based in the American University of Armenia (AUA), offers access to university´s resources, working spaces and an incubation programme for students.
- Foundation for Armenian Science and Technology (FAST), apart from the research and commercialisation activities, offers incubation for entrepreneurs to train business skills, offer facilities, and network with the private sector. As the foundation also has a Business Angels Network, the trained start-ups also can pitch their ideas.
- A relatively new player in the ecosystem is the Accelerateur 28, based in France's University in Armenia (UFAR). They target a specific technology development for each batch, like AI, AGTech, etc. The entrepreneurs receive technology training and business skills for realising the idea into a product.

According to the interviews with the Armenian ICT ecosystem stakeholders, a low number of the incubated start-ups reach the seed stage, since the incubators are using pre-acceleration educational programmes and not incubation programmes.

Criteria: The estimated number of incubators per million inhabitants:

- **Grade 2**: The number of incubators per million inhabitants in Armenia is 1,03 from a total number of four incubators; 1,01 less incubators compared to 2,04 incubators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active incubators:

- **Grade 3**: The Armenian incubators' average operating period is three years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The incubators offer limited access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R8. Creating incubators.
- **Medium priority**: R9. Empowering Incubators by implementing specialised incubation programmes.
- **Low priority**: R10. Boosting incubators by implementing "idea-stage" grant schemes.

Table 12. List of incubators in Armenia

#	Name of incubator	Founding year
1	Entrepreneurship and Product Innovation Centre (EPIC)	2016
2	French University of Armenia (UFAR) Accelerateur 28	2020
3	Foundation for Armenian Science and Technology (FAST)	2017

Indicator 2.2. The quality of the accelerators.

According to the country-level assessment, the local ecosystem integrates four accelerators to assist the start-up in business model validation, sales generation and further investment opportunities (*see table below*). The accelerators are Beeline Start-up Incubator, Armenia Start-up Academy, UNDP Impact AIM Venture Accelerator, and StartDoon. Some of those programmes are directly interlinked to VC or Angel Investment funds.

Armenia Start-up Academy offers a pre-acceleration programme that guides pre-seed stage start-ups through prototyping, customer development, go-to-market strategy development, and pitching. The Academy gives access to 100+ mentors and industry specialists for the start-ups. The most promising start-ups have access to the seed-fund called SmartGate VC owned by the same programme founders.

UNDP Impact AIM Venture Accelerator offers several industry-based acceleration programmes in collaboration with the public sector and other ecosystem stakeholders. The programmes are:

- Impact AIM Climate Change Tech Accelerator is a training and mentorship programme on energy efficiency and renewable energy projects;
- Impact AIM ANAU AgriTech Accelerator is designed to support science and technology-backed start-ups and budding entrepreneurs offering solutions to tackle challenges in the agricultural sector of Armenia and worldwide. The participants receive in-depth learning workshops and use the facilities of the Armenian National Agrarian University (ANAU).
- AIM GovTech is an acceleration programme that relies on leveraging innovative technologies, strongly encouraging the use of blockchain and artificial intelligence, on advancing the Sustainable Development Goals (SDGs) in the realm of governance and public policy.

StartDoon is a French-Armenian accelerator assisting the start-ups in reaching out to international clients and foreign investors.

Beeline Start-up Incubator offers business training, workshops and access to funding to the start-ups, and can use the incubator's facilities.

Criteria: The estimated number of accelerators per million inhabitants:

- **Grade 3**: The number of accelerators per million inhabitants in Armenia is 1,30 from a total number of four accelerators; more than 0,08 accelerators compared to 1,22 accelerators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active accelerators:

- **Grade 2**: The Armenian accelerators´ average operating period is 2,7 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The accelerators offer optimal access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R11. Creating accelerators.
- **Medium priority**: R12. Empowering accelerators by implementing specialised pre-acceleration programmes.
- **High priority**: R13. Boosting accelerators by implementing seed-stage grant schemes.
- **High priority**: R14. Boosting accelerators through access to local and international markets.

Table 13. List of accelerators in Armenia

#	Name of accelerator	Founding year
1	Beeline Start-up Incubator	2017
2	Armenia Start-up Academy	2018
3	StartDoon	2017
4	UNDP Impact AIM Venture Accelerator	2017

Indicator 2.3. The existence of international accelerators operating in the country.

According to the country-level assessment, no international accelerator is still fully available in the country.

The ecosystem is just starting to collaborate with international accelerators to bring them to the country or send local start-ups to international accelerators. The stakeholders mention that there are pending discussions with some Silicon Valley and European actors, like Draper University, SAP.io, SkyDeck Accelerator and Start-up Wise Guys.

Criteria: The existence of international accelerators operating in the country:

- **Grade 0**: No international accelerators are operating in the Armenia but supporting ICT ecosystem start-ups remotely.

Evaluation of the indicator:

- **On performance**: The international accelerators offer limited access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R15. Attracting international accelerators to the local ecosystem.

KPI 3. Performance of the educators in the seed stage

Indicator 3.1. The existence of mentorship associations.

According to the country-level assessment, the entrepreneurs meet industry mentors during entrepreneurial events and acceleration programmes. Apart from those, there is still no unified Armenian mentorship association via which entrepreneurs could connect to local and international mentors.

Criteria: The existence of mentorship associations operating in the country:

- **Grade 0**: No mentorship associations are operating in the Armenian ICT entrepreneurial ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no mentorship associations in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority**: R16. Creating mentorship associations.
- **Low priority**: R17. Boosting mentorship associations by implementing access to service providers´ funding capacity.

Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

According to the country level assessment, the private sector is not proactive in offering access to entrepreneurial programmes. A notable example is the Beeline Start-up Incubator initiated by the telecom company Veon Armenia in 2017.

IT and software development companies might create spin-offs from their internal human resources. However, no educational programme for entrepreneurs is offered.

Criteria: The existence of the private sector´s entrepreneurial programmes operating in the country:

- **Grade 3**: One private sector´s entrepreneurial programme is operating in the Armenian ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The private sector´s entrepreneurial programmes offer limited access to knowledge to start-ups from the pre-seed stage to the early stage, in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R18. Empowering specialised incubation by focusing on digitalisation of the local industry.

Table 14. List of private sector's entrepreneurial programmes in Armenia

#	Name of private sector's entrepreneurial programme	Founding year
1	Beeline Start-up Incubator	2017

KPI 4. Performance of the investors from the idea to the pre-seed stage

Indicator 4.1. The existence of crowdfunding platforms.

According to the country-level assessment and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, no existing crowdfunding platforms operate in Armenia's ICT ecosystem.

There is one crowdfunding platform called ONEArmenia, allowing small Armenian investors to make micro-investments in multi-sector companies. ONEArmenia does not have investment projects in technology start-ups, hence, it does not apply to the diagnosis.

It is important to highlight that Armenia has one of the most reputable crowdfunding marketing agencies in the world The Crowdfunding Formula, who help start-ups from all over the world to launch their crowdfunding campaigns on the leading international platforms.

Criteria: The existence of crowdfunding platforms operating in the country:

- **Grade 0**: No crowdfunding platforms are operating in the Armenian ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no crowdfunding platforms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the idea stage to the early stage.

Recommendations:

- **High priority:** R26. Creating crowdfunding platforms.
- **Low priority:** R27. Empowering crowdfunding platforms by connecting private sector with ICT ecosystem.

KPI 5. Performance of the investors from the seed to the early stage

Indicator 5.1. The quality of the local venture capital firms.

According to the country-level assessment and the Market Assessment for Digital Innovation and Scale-up Initiative in the Eastern partner countries, three venture capital funds (*see table below*) and one pre-seed stage fund are operating in Armenia. From 2017-2020 locally represented VCs invested around $4,3 million in Armenian start-ups.

Armenia's first venture capital fund, Granatus Ventures, was launched in 2013 and has invested in 14 companies since then.

Several other schemes and platforms have emerged in more recent years, including SmartGate Venture Capital, which has matched pre-seed and seed investments in several rounds and invested in 14 start-ups since its launch in 2017.

The American/Armenian venture capital firm "HIVE Ventures" has been operating in Armenia since 2014 connecting the local start-ups with the US acceleration programmes and investors. It is an international VCs but has a local presence in Armenia.

The Sprint Crowdfunders Fund was created in 2018, investing in pre-seed high-tech start-ups to afford future investment rounds through crowdfunding campaigns in Armenia and worldwide. Although the fund is based in Armenia and has made more than 40 micro-investments, none of them has been in the local ecosystem's start-ups yet.

Criteria: The number of venture capital firms per million inhabitants:

- **Grade 2**: The number of venture capital firms per million inhabitants in Armenia is 1.07 from a total estimated number of three venture capital firms; 0.66 less compared to 1.73 venture capital firms per million inhabitants in the selected East-Central Europe countries.

Criteria: The average number of investments per local venture capital firm from 2017 to 2020:

- **Grade 3**: The average number of investments per local VC firms in Armenia from 2017 to 2020 is 8 from a total 24 investments; more than 1.93 compared to the average of 6.07 number of investments in the selected East-Central Europe countries.

Criteria: The average operating period of the country's active venture capital firms:

- **Grade 4**: The Armenian venture capital firms´ average operating period is 5.3 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The venture capital firms offer optimal access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R20. Creating venture capital firms.
- **High priority:** R19. Empowering venture capital firms through fund of funds programmes.
- **High priority:** R21. Boosting venture capital firms through access to international markets.

Table 15. List of local venture capital firms operating in Armenia

#	Name of local venture capital firm	Founding year	Number of investments since 2017
1	Granatus Ventures	2013	6
2	SmartGate VC	2017	13
3	HIVE Ventures	2014	5

Indicator 5.2. The existence of international venture capital firms operating in the country.

According to the country-level assessment, there is only one international venture capital firm called HIVE Ventures operating in Armenia since 2014. It was funded in US by Armenians, thus, it is treated in this analysis both, as a local and as international VC.

Criteria: The existence of international venture capital firms operating in the country:

- **Grade 3**: One international venture capital is operating in the Armenian ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The international venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R22. Attracting international venture capital firms to the local ecosystem.

Table 16. List of international venture capital firms operating in Armenia

#	Name of international venture capital firm	Founding year	Number of investments since 2017
1	HIVE Ventures	2014	5

Indicator 5.3. The quality of business angels networks.

According to the country-level assessment, three business angels networks are operating in Armenia including the Business Angel Network of Armenia, the Science and Technology Angel Network, and the Angel Investor Club of Armenia (*see table below*).

The experience of angel investments started for the last few years and is burgeoning as the investors become more knowledgeable on investment mechanisms and smart financing. The existing networks communicate with each other, and there are a few cases of syndicate investments. The number of members in the country is beyond 50, and not all of them have invested in start-ups yet. As the business angel networks suggest until now, 15 angel investments have been made in the local start-ups.

Criteria: The number of business angels networks per million inhabitants:

- **Grade 3:** Three business angel networks are operating in the Armenian ICT ecosystem.

Criteria: The average number of investments per local business angels network from 2017 to 2020:

- **Grade 1**: The average number of investments per local business angels network in Armenia from 2017 to 2020 is 5.66 from a total 15 investments; 12.54 less compared to the average of 18.20 number of investments in the selected East-Central European countries.

Criteria: The average operating period of the country's active business angels networks:

- **Grade 2**: The Armenian business angels networks´ average operating period is 2.3 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The business angel networks offer adequate access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R23. Creating business angels networks.
- **High priority:** R24. Empowering business angels networks by strengthening the investment expertise.
- **Medium priority:** R25. Boosting business angels networks through co-investment matching programmes.

Table 17. List of business angels networks in Armenia

#	Name of business angels network	Founding year	Number of investments since 2017
1	Business Angel Network Armenia	2018	7
2	Angel Investment Club of Armenia	2018	5
3	Science and Technology Angel Network	2017	3

KPI 6. Performance of the connectors in talent generation

Indicator 6.1. The existence of talent generation events[6].

According to the country-level assessment, the ecosystem hosts many events in the form of hackathons, webinars and competitions on raising awareness on entrepreneurship. Entrepreneurs learn tech and business skills and meet the ecosystem start-ups and stakeholders. Many of these events are held for just one time and have no continuation in time.

The main recurring event is the "Start-up Boost Weekends". They have held more than seven entrepreneurial weekends since its foundation in 2018 collaborating with the leading universities in Armenia.

Criteria: The existence of relevant talent generation events in the country:

- **Grade 3**: One relevant talent generation event is operating in the Armenian ICT ecosystem.

Criteria: The average operating period of the country's active talent generation events:

- **Grade 1**: The Armenian talent generation events´ average operating period is two years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The talent generation events offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R28. Creating talent generation events.
- **Medium priority:** R29. Empowering talent generation events through sponsorship.

Table 18. List of talent generation events in Armenia

#	Name of talent generation event	Founding year
1	Start-up Boost Weekend	2018

[6] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

KPI 7. Performance of the connectors from the idea to the pre-seed stage

Indicator 7.1. The quality of the entrepreneurial events[7].

According to the country-level assessment, Armenia is successfully promoting the entrepreneurial ecosystem via stakeholder events.

One of the most well-known events is the Seaside Start-up Summit. In this 6-day outdoor camping event, all the ecosystem stakeholders meet each other and start-ups, share opportunities and mutual interests. The event hosts around 1,000 participants per event from Armenia and internationally, including entrepreneurs, investors, public sector representatives and mentors. It is one of a kind event for start-ups to learn, meet mentors, build teams, raise funding, and more.

Other popular events among start-ups are the HIVE Annual Tech Summit, ChainPoint Conference, Start-up Grind Armenia, Science and Technology Convergence (STC) Conference, Empowering Regions High-Tech, FAST Global Innovation Forum, and the Engineering Week held in Yerevan and Vanadzor annually (*see table below)*.

Criteria: The number of entrepreneurial events per million inhabitants:

- **Grade 4**: The number of entrepreneurial events per million inhabitants in Armenia is 2,7 from a total number of eight recurrent events; more than 1,18 compared to 1,52 entrepreneurial events per million inhabitants in the selected East-Central European countries.

Criteria: The average estimated number of attendees per entrepreneurial event:

- **Grade 1**: The average number of attendees per entrepreneurial event in Armenia is 500; 1,700 smaller compared to 2,200 average number of attendees per entrepreneurial event in the selected East-Central European countries.

Criteria: The average operating period of the country's active entrepreneurial events:

- **Grade 2**: The Armenian entrepreneurial events' average operating period is 2,4 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The entrepreneurial events offer optimal access to the market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R30. Creating entrepreneurial events.
- **Medium priority:** R31. Empowering entrepreneurial events through sponsorship.
- **High priority:** R32. Boosting entrepreneurial events through internationalisation.

[7] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Table 19. List of entrepreneurial events in Armenia

#	Name of entrepreneurial event	Founding year	Number of participants in 2019
1	Seaside Start-up Summit	2016	1000
2	ChainPoint Conference	2018	500
3	HIVE Ventures Summit	2017	400
4	Empowering Regions through High-Tech	2018	200
5	Engineering Week	2019	500
6	Start-up Grind Armenia	2017	Unknown
7	FAST Global Innovation Forum	2018	674
8	Science and Technology Convergence (STC) Conference	2018	200

Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem.

According to the country-level assessment, starting from 2018 there is an increased promotion and awareness of entrepreneurial and IT activities in the Armenian media.

Armenian start-ups that boost the local tech and entrepreneurial scene have been featured in and recognised by the various local news outlets. Websites like iTel (Mediamax), VNews, StartHub, Hetq, EVN Report, Tiv 1 present and bring attention to the tech sector and the latest start-up scene news (*see table below*). They cover events, prepare articles about start-ups and technology sector, and write about success stories and developments within the Armenian tech scene.

Local media and national news media outlets as well as feature and cover tech events. TV channels such as Azdarar News and Ararat TV promote tech and entrepreneurial coverage. Armenian media does not fall short of endorsing young and upcoming entrepreneurs and tech leaders and recognising their progress in tech retrospect. Nonetheless, the specialised tech entrepreneurial media in Armenia are Itel and StartHub.

There are no local databases in the country, which provide aggregated information of the local ecosystem players and activities.

Criteria: The existence of specialised entrepreneurial media in the country:

- **Grade 3:** Two specialised entrepreneurial media are operating in the Armenian ICT ecosystem.

Criteria: The existence of relevant ICT entrepreneurial ecosystem databases:

- **Grade 0**: No ICT entrepreneurial ecosystem´s databases are operating in the Armenian ICT ecosystem.

Criteria: The average operating period of the country's active specialised entrepreneurial media and databases:

- **Grade 4**: The Armenian specialised entrepreneurial media and ecosystem´s databases average operating period is 6.5 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R33. Creating ICT ecosystem databases.

Table 20. List of specialised entrepreneurial media in Armenia

#	Name of specialised entrepreneurial media	Founding year
1	Itel	2009
2	StartHub	2018

KPI 8. Performance of the connectors from the seed to the early stage

Indicator 8.1. The existence of investment forums[8].

According to the country-level assessment, only the Business Angels Network of Armenia (BANA) is organising an investments forum in Armenia called the Early-stage Investment Conference (ESIC), held yearly since its launch 2018. The event attracts European successful business angels to share investing experiences with the local investors and inspire them.

There is interest in the ecosystem to hold more investment forums connecting local and international investors, since investment forums were planned in Armenia but never completed, such as “Invest Armenia 2019”. Furthermore, in 2020, the Government of Republic of Armenia and the EU delegation were planning on implementing the “EU-Armenia Investment Forum”, which was eventually halted by the pandemic.

Criteria: The existence of investment forums in the country:

- **Grade 3:** One investment forum is operating in the Armenian ICT ecosystem.

Criteria: The average operating period of the country’s active investment forums:

- **Grade 1**: The Armenian investment forums´ average operating period is two year as of the date of this report.

Evaluation of the indicator:

- **On performance**: The investment forums offer limited access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R34. Creating investments forums.
- **Medium priority:** R35. Empowering investment forums through sponsorship.
- **Low priority:** R36. Boosting investment forums through internationalisation.

Table 21. List of investment forums in Armenia

#	Name of investment forum	Founding year
1	Early-Stage Investment Conference (ESIC)	2018

Indicator 8.2. The existence of national trade fairs and business forums[9].

According to the country-level assessment, various multisectoral national trade fairs and business forums have been held in Armenia over the years. The last 5 years have seen increasing growth in the number of such events, notably the food and beverage, agricultural, and tourism sectors. The popular ones are the International Tourism

[8] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

[9] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Exhibition in Tour Expo, Health Service & Pharmacy Expo, Panarmenian Expo, Agricultural Trade Fair and the ATN Armenia-Diaspora Business Forum (*see table below)*.

The only business forum specialising for the IT and start-up sector is the annual Digitech Expo, which gathers over 2000 participants each year and allows tech companies to display their offerings from their booths while connecting them to local private and public sector representatives, financiers, and other relevant stakeholders.

The Armenian Trade Network organised business forum is also held every year, in collaboration with the Government of Armenia to host local and international representatives and consider ways of business development and collaborations.

Criteria: The existence of national trade fairs and business forums in the country:

- **Grade 3:** Six national trade fairs and business forums are operating in the Armenian ICT ecosystem.

Criteria: The average operating period of the country's active national trade fairs and business forums:

- **Grade 1**: The Armenian national trade fairs and business forums´ average operating period is 6.8 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The national trade fairs and business forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Medium priority:** R37. Empowering business forums by connecting private sector with ICT ecosystem.
- **High priority:** R38. Boosting the promising start-ups through accessing to international trade fairs.

Table 22. List of trade fairs and business forums in Armenia

#	Name of trade fair and business forum	Founding year
1	International Tourism Exhibition in Tour Expo	2013
2	Health Service & Pharmacy Expo	2001
3	Panarmenian Expo	2011
4	Agricultural Trade Fair	2017
5	ATN Armenia-Diaspora Business Forum	2015
6	Digitech Expo	2016

KPI 9. Performance of the facilitators in the idea stage

Indicator 9.1. The quality of tech facilities to support the start-up creation.

According to the country-level assessment, there are several technology hubs, tech centres and labs in Armenia (*see table below)*:

- The engineers create their start-ups in tech parks such a Gyumri Technology centre (GTC) and Vanadzor Technology centre (VTC).
- Children of Armenia Fund (COAF) provide tech facilities, integrating various labs, within its SMART centre.
- The Engineering City is a group of facilities designed to support engineers to create high-tech start-ups with complex engineering solutions. It provides a full range of advanced equipment, research and prototyping labs, machine tooling and production facilities that are accessible to all the resident companies.

- Innovative Solutions and Technologies centre (ISTC) offers a co-working space and tech education for entrepreneurs to host IT events. Visitors can implement joint tech projects using equipment and digital tools.

Criteria: The number of tech facilities per million inhabitants:

- **Grade 2**: The number of tech facilities per million inhabitants in Armenia is 1,3 from a total of four tech facilities; more than 0,02 compared to 1,32 tech facilities per million inhabitants in the selected East-Central European countries.

Criteria: The average number of annual founded spin-offs per tech facilities:

- **Grade 0**: The average number of yearly founded spin-offs per tech facilities in Armenia from 2017 to 2020 is 0; about two smaller compared to 2,03 yearly founded spin-offs per tech facilities in the selected East-Central European countries from 2017 to 2020.

Criteria: The average operating period of the country's active tech facilities:

- **Grade 4**: The Armenian tech facilities´ average operating period is 4.5 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R39. Creating tech parks.
- **Medium priority:** R40. Empowering tech facilities through technology clustering.

Table 23. List of tech facilities in Armenia

#	Name of tech facility	Spin-offs/ year	Founding year	Free working space	Laboratories	Access to interns
1	Gyumri Technology Centre (GTC)	0	2014	Yes	Yes	No
2	Vanadzor Technology Centre (VTC)	0	2016	Yes	Yes	No
3	Children of Armenia Fund (COAF)	0	2017	Yes	Yes	No
4	Innovative Solutions and Technologies Centre (ISTC)	0	2015	Yes	No	No

Indicator 9.2. The existence of tech facilities to support the start-up creation in small urban and rural areas.

According to the country-level assessment, various incentives and facilities have been implemented to support entrepreneurial and business development in such areas, backed by the establishment of relevant facilities providing the required logistical means to ensure the appropriate development environment.

Urban and rural development is gaining progressive importance in Armenia since multiple facilities have been established within various regions (*see table below*).

Criteria: The existence of tech facilities operating in the country's small urban and rural areas:

- **Grade 3**: Three tech facilities in small urban and rural areas are operating in the Armenian ICT ecosystem.

Evaluation of the indicator:

- **Optimal performance**: The tech facilities in small urban and rural areas offer optimal access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R42. Creating tech parks in small urban areas.

Table 24. List of tech facilities in Armenia

#	Name of tech facility	Founding year
1	Children of Armenia Fund (COAF) SMART Centre	2014
2	Gyumri Technology Centre	2014
3	Vanadzor Technology Centre	2016

KPI 10. Performance of the facilitators from the pre-seed to the early stage

Indicator 10.1. The existence of business facilities to support the start-up development.

According to the country-level assessment, different business facilities are at the disposal of local start-ups which provide working spaces, networking and event halls, leisure areas, cafeterias or restaurants, and other necessary spaces creating all the conditions for a productive professional environment.

The popular co-working spaces that are affordable for start-ups and offer professional and equipped working spaces and business environment are Impact Hub, Elite Plaza Business Centre, Erebuni Plaza Business Centre and Yerevan Plaza Business Centre (*see table below*).

In Armenia, there is a historic scientific centre, named the Mergelyan Institute, which has been established in 1956 and played an essential role in the tech development of the Soviet Union. Today, at the Mergelyan Institute, the Mergelyan Cluster is created. It hosts several big IT and software development companies, the Expo building where the exhibitions are held, cafes, conference rooms, labs, etc.

Criteria: The existence of business facilities in the country:

- **Grade 3:** Five business facilities are operating in the Armenian ICT ecosystem.

Criteria: The average operating period of the country's active business facilities:

- **Grade 3**: The Armenian business facilities´ average operating period is 17.7 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The business facilities offer optimal access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R41. Boosting the promising start-ups through accessing to business centres.

Table 25. List of co-working spaces and business centres in Armenia

#	Name of co-working space or business centre	Founding year
1	Elite Plaza Business Centre	2012
2	Erebuni Plaza Business Centre	2015
3	Mergelyan Cluster	1956
4	Yerevan Plaza Business Centre	1998
5	Impact Hub	2014

Involvement of the public sector in the development of the ecosystem

The level of involvement of the public entities such as government, development agencies and international organisations is key to the ecosystem's growth. Although these entities performance is not evaluated in this analysis, the authors summarise their involvement in the ICT entrepreneurial ecosystem's development in the sections below.

International organisations

According to the country-level assessment international organisations are offering start-ups access to knowledge, capital and market and resources:

1) The most notable international organisations involvement in offering access to knowledge in the idea and pre-seed stages is delivered by the EU funded Support to SME Development in Armenia programme (SMEDA) and UNDP funded "UNDP Impact Aim Venture Accelerator."

   The EU SMEDA programme has implemented the Armenia Start-up Academy pre-accelerator, in collaboration with Catalyst Foundation, and funded the implementation of training on entrepreneurial content for start-ups in collaboration with Crosppring.

   The UNDP funded Impact Aim Venture Accelerator, launched in 2017, offers several industry-based acceleration programmes to support pre-seed and seed-stage start-ups, providing them with training and networking.

2) The most notable international organisations involvement in offering access to capital in the idea and pre-seed stages is delivered by the EU funded Support to SME Development in Armenia (SMEDA) programme and the World Bank funded Trade Promotion and Quality Infrastructure (TPQI) programme.

   The SMEDA project, which was co-funded by the European Union and the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by GIZ PSD SC Regional Programme, in cooperation with Enterprise Incubator Foundation (EIF), announced two grant competitions for the years 2017-2018:

   - Innovation Matching Grant (IMG). The amount per initiative was between €30,000 and €50,000.
   - Science and Technology Entrepreneurship (STEP) grant. The amount was €15,000 per project.

   Overall, from 2017 to 2018, 34 start-ups have received funding with a total amount of around €866,000. 8 of the 34 grantees have raised follow-up rounds. The total disclosed amount of investments raised by grantees is around €1,5 million.

   In 2019 and 2020 the Enterprise Incubator Foundation announced the Innovation and Regional Matching Grant competition with the support of the Government of the Republic of Armenia and World Bank in the framework of the World Bank Trade Promotion and Quality Infrastructure (TPQI) Project. There are two types of grants:

   - IMG aim to support new adaptation, development, or improvement of a solution, product/service, technology teams, and SMEs' process.
   - RMG aim at promoting the development of technology companies in the regions. The size of grants ranges from €10,000 to €50,000.

   In 2018-2019 the SMEDA programme supported the creation of the Business Angel Network of Armenia by providing access to international experts, investors and funding the organization of investment forums.

3) The most notable international organisations involvement in offering access to market to start-ups is delivered by the EU-funded programme SMEDA programme. For three years, the programme had conducted many initiatives funding and promoting entrepreneurial events and connecting the entrepreneurs with the local and international market. Several outstanding initiatives are mentioned below.

   The entrepreneurial events supported and funded by the SMEDA programme are:

   - The yearly Sevan Start-up Summit in 2017, 2018 and 2019.
   - Business Angel Investment Conference.

- Start-up Boost Weekends.
- Science and Technology Convergence Conference in 2018 and 2019.
- Business Innovation Forum in 2018 and 2019.
- Empowering Regions through Innovation in 2018 and 2019.

The EU funded SMEDA programme was carrying out a Women Entrepreneurship project for empowering female entrepreneurs. Under the project, several networking events were organized where the businesswomen were having panel discussions and networking activities for building business partnerships among each other.

Under the programme in 2017, several Armenian start-ups have participated in the event Start-up Ole in Salamanca (Spain). They had a chance to network with investors, corporations, accelerators and other start-ups. In 2018, four start-ups and several ecosystem representatives visited the Hannover Messe 2018 international trade fair to showcase their products and network with foreign peers[10].

4) The most notable international organisations involvement in offering access to resources is delivered by the EU funded TUMO Convergence centre programme, and the World Bank funded Trade Promotion and Quality Infrastructure (TPQI) programme.

   EU funded TUMO Convergence centre programme, in collaboration with the TUMO Armenia, is building a tech facility that will offer Armenian students access to education on emerging technologies and R&D and support their developed technologies transfer to the private sector through the creation of start-ups. The construction launched in 2018 and is set to open its doors in 2022.

   The Engineering City Project is a Public-Private Partnership between the Government of Armenia and a Consortium of Private Companies. The World Bank funded the project that was officially launched in 2018. The facilities are planned to open in 2022.

Government as an ecosystem builder

According to the country-level assessment, the government provides loan guarantees through SME DNC to the small and medium enterprises (not directly targeting IT start-ups).

Ministry of High-Tech Industry launched free training courses under the programme “Edutainment” and has also provided grants to start-ups for accessing knowledge through the “Idea to Business” grant competition, which grants around €4,100 to each start-up.

For mitigating the consequences of the COVID-19 in 2020, an anti-crisis grant programme was introduced for IT companies at the amount of €1,6 million.

The Office of the High Commissioner of Diaspora Affairs and the Ministry of High-Tech Industry jointly launched the Neruzh programme in 2018, which is a yearly event aimed at diversifying and developing the local start-up ecosystem by promoting start-ups of the Diaspora through mentorship, investments and networking throughout a week-long event.

In 2020, the Ministry of High-Tech Industry established an official collaboration with California-based Draper University to offer 5 entrepreneurs from the Armenian ecosystem the opportunity to study a 6-month course and expand their knowledge and skills. The project was later changed into an online course provided by Draper University due to the restrictions caused by the Covid-19 pandemic.

During the last 3 years, the total estimated fund size of governmental programmes in the ICT entrepreneurial ecosystem development in Armenia is €2,416 million.

[10] More information about SMEDA activities: https://www.linkedin.com/company/smeda/about/.

Table 26. List of governmental entrepreneurial programmes in Armenia

#	Name of the governmental entrepreneurial programme	Founding year	Fund size
1	From Idea to Business Grant Competition	2020	€30,000
2	17th Anti-Crisis Programme	2020	€1,6 million
3	Neruzh	2018	€166,000
4	Edutainment	2020	€620,000

Government as a regulator

According to the country-level assessment, the Armenian government has declared IT as a priority of the national economy since 2000. And since then, they have slowly built the country's institutional capacity by establishing several technology-driven union and foundations for supporting the creation of the ecosystem. In 2018 a designated Ministry for High Technology Industry was established. The Ministry of High Technology Industry of the Republic of Armenia has drafted a comprehensive 2020-2025 strategy document containing three different strategies for the Development of High-Tech Industries in Armenia, digitalization of the Military-Industrial complex of Armenia. The Ministry is currently offering entrepreneurial training courses and grants for start-ups[11]. The Ministry of Economy also has support programmes for SMEs (not focused on technology start-ups) providing training and loan guarantees. The government support programmes are conducted through the administrative bodies of the ministries.

The main tax categories in Armenia are relatively low. The Law on State Support of the Republic of Armenia provides significant tax benefits to IT companies[12]: exemption from profit tax (0%) and reduced income tax from 23% to 10%. These benefits are offered to new companies with less than 30 employees. These incentives apply to local companies and branches of foreign IT companies and stay in effect until 2022. In April 2019, several amendments were done to this law which opens new favourable opportunities.

The Law on Free Economic Zones (FEZ)[13] in Armenia provides tax relief for entities operating in various key industries. It covers income tax, property tax, profit tax, customs duties, VAT for products in the territory of the FEZ, and services delivered to the organiser and operator. There are currently 4 FEZs in operation (2 in Yerevan, 1 in Meghri, 1 in Hrazdan). The fifth FEZ is planned to be in Hrazdan town specialised in high-tech solutions (blockchain, cryptocurrency mining centres, cloud-based technologies, big data analytics, etc.).

The Law of the Republic of Armenia on Foreign Investments[14] provides several incentives for foreign investors' rights, legal interests, and property protection. The incentives include removing obstacles to investment entry, not levying duties on investment in founding capital and providing mechanisms for protecting foreign investments. In case of changes in the legislation (within five years of the investment), the foreign branches or companies can follow the initial legislation if they request so. The incentives provided for foreign investors include 100% ownership of property, right to buy land, complete exemption of customs duties, VAT, profit and property taxes as a resident of Free Economic Zones, "One-stop-shop" based services provided by state agencies, no limitation on currency exchange at market rates, unlimited access to any sector and geographic location within the country, and other.

[11] Training courses and grants offered by the Ministry of High Technology Industry of the Republic of Armenia: https://hti.am/main.php?lang=1&page_id=652&id=0&page_name=default.
[12] Law of the Republic of Armenia State Support for IT Sector, 2018, http://www.arlis.am/DocumentView.aspx?DocID=130329.
[13] Law "On Free Economic Zones", the Republic of Armenia, Government decree №1521-N of October 13, 2011.
[14] The Law of the Republic of Armenia on Foreign Investments: https://investmentpolicy.unctad.org/investment-laws/laws/8/armenia-foreign-investment-law.

4.3. Recommendations by priority in Armenia

Below the experts list the **high and medium priority** recommendations necessary to empower the ICT entrepreneurial ecosystem of Armenia.

Also, the detailed list of all main recommendations for capacity builders acting in the six Eastern Partnership countries can be found in Chapter 11.

Table 27. Priority recommendations for empowering the Armenian ICT entrepreneurial ecosystem by area and stage

Recommendation	Priority	Area	Stage
R1. Creating universities´ entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R2. Empowering universities by implementing specialised entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R6. Boosting technology education centres by implementing educational specialisation in emerging technologies	HIGH	KNOWLEDGE	IDEA
R7. Boosting technology education centres by funding capacity for R&D development	HIGH	KNOWLEDGE	IDEA
R8. Creating incubators	HIGH	KNOWLEDGE	PRE-SEED
R9. Empowering incubators by implementing specialised incubation programmes	MEDIUM	KNOWLEDGE	PRE-SEED
R12. Empowering accelerators by implementing specialised pre-acceleration programmes	MEDIUM	KNOWLEDGE	SEED
R13. Boosting accelerators by implementing seed-stage grant schemes	HIGH	KNOWLEDGE	SEED
R14. Boosting accelerators through access to local and international markets	HIGH	KNOWLEDGE	SEED
R15. Attracting international accelerators to the local ecosystem	HIGH	KNOWLEDGE	SEED
R16. Creating mentorship associations	HIGH	KNOWLEDGE	EARLY
R18. Empowering specialised incubation by focusing on digitalisation of the local industry	HIGH	KNOWLEDGE	EARLY
R19. Empowering venture capital firms through fund of funds programmes	HIGH	CAPITAL	EARLY
R21. Boosting ventures capital firms through access to international markets	HIGH	CAPITAL	EARLY
R22. Attracting international venture capital firms to the local ecosystem	HIGH	CAPITAL	EARLY

Recommendation	Priority	Area	Stage
R24. Empowering business angels networks by strengthening the investment expertise	HIGH	CAPITAL	SEED
R25. Boosting business angels networks through co-investment matching programmes	MEDIUM	CAPITAL	SEED
R26. Creating crowdfunding platforms	HIGH	CAPITAL	PRE-SEED
R28. Creating talent generation events	HIGH	MARKET	IDEA
R29. Empowering talent generation events through sponsorship	MEDIUM	MARKET	IDEA
R31. Empowering entrepreneurial events through sponsorship	MEDIUM	MARKET	PRE-SEED
R32. Boosting entrepreneurial events through internationalisation	HIGH	MARKET	PRE-SEED
R33. Creating ICT ecosystem databases	HIGH	MARKET	SEED
R34. Creating investment forums	HIGH	MARKET	SEED
R35. Empowering investments forums through sponsorship	MEDIUM	MARKET	SEED
R37. Empowering business forums by connecting private sector with ICT ecosystem	MEDIUM	MARKET	EARLY
R38. Boosting the promising start-ups through access to international trade fairs	HIGH	MARKET	EARLY
R40. Empowering tech facilities through technology clustering	MEDIUM	RESOURCES	IDEA
R41. Boosting the promising start-ups through access to business centres	HIGH	RESOURCES	EARLY

Chapter 5: AZERBAIJAN

This diagnosis of the performance of the ICT entrepreneurial ecosystem stakeholders in Azerbaijan is structured in the following manner:

1. Current status of ICT entrepreneurial ecosystem performance through comparison of the conversion ratios of ICT start-ups in different growth stages with select European and other countries.
2. Diagnosis of the performance of the different ecosystem stakeholders: educators, investors, connectors and facilitators by evaluating 19 indicators *(see Chapter 3).*
3. Prioritisation of the main recommendations for further developing the ICT entrepreneurial ecosystem in Azerbaijan.

The detailed methodology of the diagnosis is provided in Chapter 1.

5.1. Status of the ICT Entrepreneurial Ecosystem in Azerbaijan

This subchapter provides information on:

1. Start-ups strength, by providing the comparison of the start-ups conversion ratios from the idea stage to the early stage with select European and other more mature ecosystems.
2. Ecosystems stakeholders status in the different stages of the start-ups lifecycle.

To analyse the maturity of the ICT entrepreneurial ecosystem in Azerbaijan, first the strength of the start-ups according to the conversion ratios from the idea stage to the early stage, was compared with the ratios of the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania). These countries have been selected due to relevant similarities with the Eastern partner countries such as ICT ecosystem size, targeted IT industries and their size, historical and cultural development path. In addition, the experts have compared the conversion ratios of the Azerbaijan start-ups with well-developed ecosystems of four selected Western European countries (Germany, France, United Kingdom and Spain), as well as with more mature ecosystems like California (Silicon Valley) and Israel *(see tables below).*

The conversion ratios have been calculated based on the information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries" and the largest ICT entrepreneurial databases Dealroom and CrunchBase. The latter sources provide information on a large number of start-ups and investment rounds to calculate the conversion ratios that are close to reality. However, the reader should bear in mind that the mentioned sources do not provide comprehensive data on all start-ups operating in the compared countries, especially in the idea and pre-seed stages, where start-ups have not yet received investments. Also, these sources do not collect the information on start-ups in the early to scale-up stage that have grown without the need for external investments. Nevertheless, these estimated ratios include a significant sample of companies, allowing to make an assumption about the actual conversion ratios of the start-ups in the country.

The experts have compared the conversion ratios of the Azerbaijan start-ups and other selected countries and the differences are provided in the tables below.

Table 28. Conversion ratios compared with selected East-Central European countries

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**EAST-CENTRAL EUROPE AVERAGE**	**0,06%**	**12,54%**	**4,24%**	**0,64%**	**0,19%**
1.1	**LITHUANIA**	0,11%	14,23%	4,84%	0,79%	0,30%
1.2	**ESTONIA**	0,06%	12,49%	4,96%	0,53%	0,14%
1.3	**POLAND**	0,04%	11,91%	3,21%	1,25%	0,27%
1.4	**BULGARIA**	0,05%	12,26%	4,56%	0,28%	0,11%
1.5	**ROMANIA**	0,04%	11,79%	3,64%	0,36%	0,14%
2	**AZERBAIJAN**	**0,02%**	**4,78%**	**0,90%**	**0,13%**	**0,06%**
2-1	**DIFFERENCE**	**-73,80%**	**-61,87%**	**-78,68%**	**-79,78%**	**-66,20%**

Table 29. Conversion ratios compared with selected Western European countries

#	Country	Ratio idea to pre-Seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**WESTERN EUROPE AVERAGE**	**0,11%**	**15,94%**	**4,66%**	**1,47%**	**0,59%**
1.1	**GERMANY**	0,06%	16,60%	5,13%	2,09%	0,79%
1.2	**FRANCE**	0,06%	15,92%	4,87%	1,93%	0,67%
1.3	**UNITED KINGDOM**	0,21%	16,23%	5,32%	1,27%	0,63%
1.4	**SPAIN**	0,10%	15,01%	3,31%	0,58%	0,27%
2	**AZERBAIJAN**	**0,02%**	**4,78%**	**0,90%**	**0,13%**	**0,06%**
2-1	**DIFFERENCE**	**-85,83%**	**-70,01%**	**-80,58%**	**-91,21%**	**-89,02%**

Table 30. Conversion ratios compared with California and Israel

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**CALIFORNIA**	0,73%	22,23%	4,89%	2,43%	0,68%
2	**ISRAEL**	0,26%	23,21%	6,11%	3,66%	0,72%
3	**AZERBAIJAN**	**0,02%**	**4,78%**	**0,90%**	**0,13%**	**0,06%**
3-(2+1)	**DIFFERENCE**	**-98,42%**	**-89,48%**	**-91,78%**	**-97,88%**	**-95,37%**

As illustrated in the tables above, the Azerbaijani start-ups' conversion ratios are significantly lower in almost all stages than the selected East-Central and Western European countries, and Silicon Valley ecosystems.

However, Azerbaijani start-ups conversion ratio from idea stage to the pre-seed stage is significantly lower to the selected East-Central Europe countries meaning that there are difficulties for the talented entrepreneurs to start working on their business ideas.

Also, the start-ups conversion ratio from seed stage to early stage is significantly lower due to the difficulties to grow internationally.

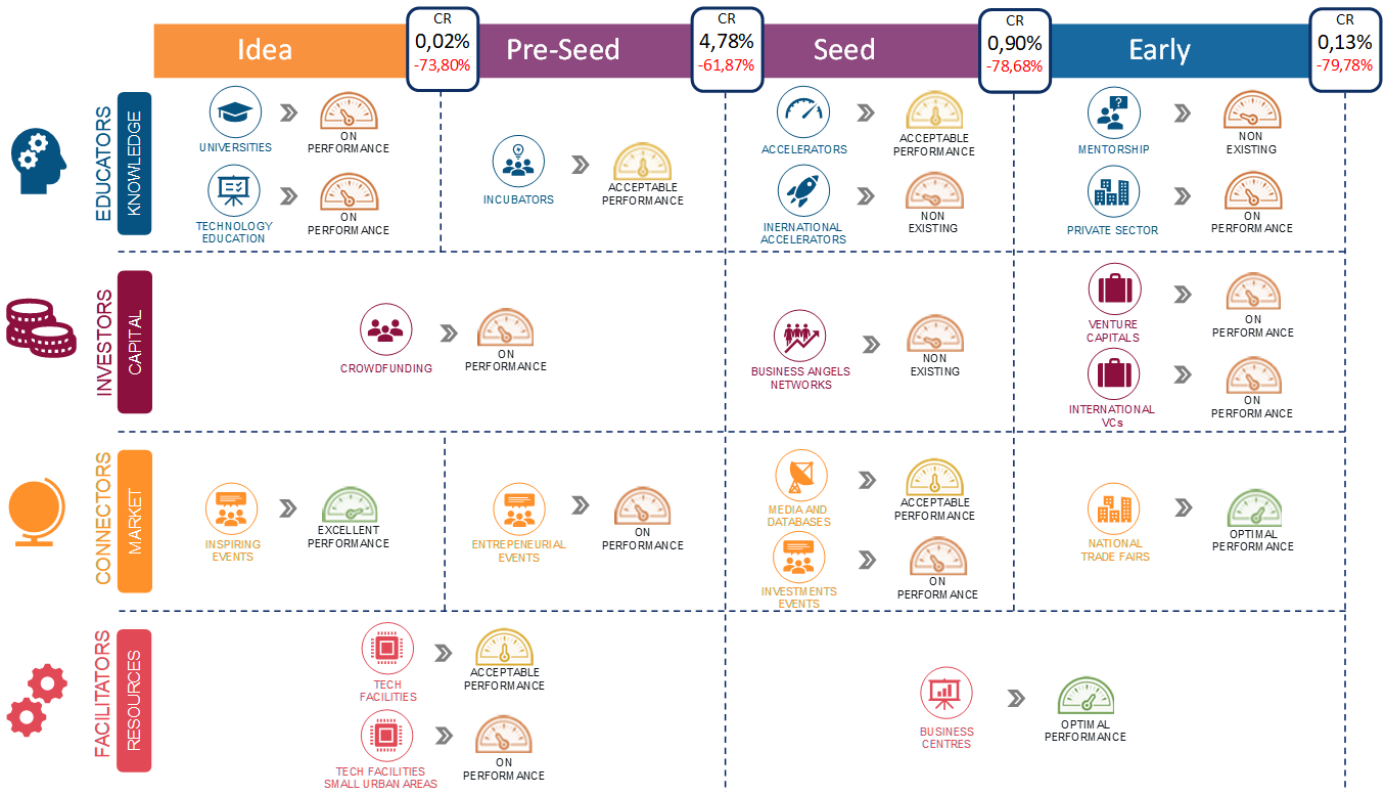
The conversion rates are impacted by the ecosystem's stakeholders involvement in start-ups' development and growth. The diagnosis below analyses those stakeholders' performance that supports start-ups' growth from the idea stage to the early stage. Once the start-up becomes a company with international perspectives or scale-up, the local entrepreneurial ecosystem stakeholders' relevance is reduced, and start-up growth is ensured by its own resources.

The figure below presents the stakeholders' level of performance at each stage of the start-ups' growth. It was developed to offer the reader a clear view of the main strengths and weaknesses of the ICT entrepreneurial ecosystem in Azerbaijan. The figure provides information on:

1. The conversion ratios (CR) of Azerbaijan ecosystem start-ups from idea to early stage.
2. The difference in the Azerbaijani start-ups' conversion ratios compared with the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania) from idea to early stage.
3. The ecosystem status by stakeholder type (from educators to facilitators) and start-up growth stage (from the idea stage to the early stage).

The majority of the stakeholders are involved in several stages of the start-up lifecycle, but in the figure, they are assigned only to the stages their involvement is the most active.

Figure 13. Azerbaijani ICT entrepreneurial ecosystem performance status (CR – conversion ratio)



The performance of the stakeholders at each growth stage of the start-ups are evaluated below.

Idea stage: 0.02% Conversion ratio from the idea stage to pre-seed stage

The conversion ratio of the Azerbaijani individuals having a business idea to entrepreneurs creating a start-up in a pre-seed stage is 0.02%, the ratio is 73,80% smaller compared to the 0.06% conversion ratio in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the idea stage is provided in the table below.

Table 31. Stakeholders´ performance in the idea stage

#	Indicator	Performance	Explanation
1.	Indicator 1.1. The quality of universities´ entrepreneurial education programmes	*On performance*	The universities' entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 1.2. The quality of technology educational centres giving access to specialisation in emerging technologies	*On performance*	The technology education entities offer limited access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 6.1. The existence of talent generation events	*Excellent performance*	The talent generation events offer excellent access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 9.1. The quality of tech facilities to support the start-up creation	*Acceptable performance*	The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 9.2. The existence of tech facilities to support the start-up creation in small urban and rural areas	*On performance*	The tech facilities in small urban and rural areas offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Pre-seed stage: 4.78% Conversion ratio from the pre-seed stage to seed stage

The conversion ratio of the Azerbaijani start-ups from the pre-seed stage to the seed stage is 4.78%; the ratio is around 61.87% smaller compared to the 12.54% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the pre-seed stage is provided in the table below.

Table 32. Stakeholders´ performance in the pre-seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.1. The quality of the incubators	*Acceptable performance*	The incubators offer adequate access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 4.1. The existence of crowdfunding platforms in the country	*On performance*	The crowdfunding platforms offer limited access to capital to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 7.1. The quality of the entrepreneurial events	*On performance*	The entrepreneurial events offer limited access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Seed stage: 0.90% Conversion ratio from the seed stage to early stage

The conversion ratio of the Azerbaijani start-ups from the seed stage to the early stage is 0.90%; the ratio is 78.68% smaller compared to the 4.24% conversion ratio in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at seed stage is provided in the table below.

Table 33. Stakeholders´ performance in the seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.2. The quality of the accelerators	*Acceptable performance*	The incubators offer adequate access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 2.3. The existence of international accelerators operating in the country	*Non-existent*	There are no international accelerators in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the pre-seed stage to the seed stage.
3.	Indicator 5.3. The quality of business angels networks	*Non-existent*	No business angel networks in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the pre-seed stage to the seed stage.
4.	Indicator 7.2. The existence of specialised entrepreneurial media and databases	*Acceptable performance*	The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.1. The existence of investment forums	On *performance*	The investment forums offer limited access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Early stage 0.13% Conversion ratio from the early stage to scale-up

The conversion ratio of the Azerbaijani start-ups from the early stage to scale-up is 0.13%; the ratio is around 79,78% smaller compared to 0.64% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the early stage is provided in the table below.

Table 34. Stakeholders´ performance in the early stage

#	Indicator	Performance	Explanation
1.	Indicator 3.1. The existence of mentorship associations	*Non-existent*	There are no mentorship associations in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the seed stage to the early stage.
2.	Indicator 3.2. The existence of the private sector´s entrepreneurial programmes	*On performance*	The private sector´s entrepreneurial programmes offer limited access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 5.1. The quality of the local venture capital firms	*On performance*	The venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 5.2. The existence of international venture capital firms operating in the country	*On performance*	The international venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.2. The existence of national trade fairs and business forums	*Optimal performance*	The national trade fairs and business forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
6.	Indicator 10.1. The existence of business facilities to support the start-up development	*Optimal performance*	The business facilities offer optimal access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

5.2. Diagnosis of the maturity of the ICT entrepreneurial ecosystem in Azerbaijan

The diagnosis below evaluates the performance of the ICT entrepreneurial ecosystem´s stakeholders in Ukraine, such as educators, investors, connectors and facilitators. The evaluation is based on an analysis of 19 indicators graded from 0 to 4 (*see Annex 1: Indicator´s evaluation criteria*). Following that, the conclusions on current performance and recommendations for improvement are provided, excluding evaluation of the regulators / public sector performance (*for more explanations see the methodology in Chapter 1*).

KPI 1. Performance of the educators in talent generation

Indicator 1.1. The quality of universities´ entrepreneurial education programmes[15].

According to the country level assessment, three universities in Azerbaijan offer education related to entrepreneurship (*see also table below)*:

- Khazar University offers the course “Entrepreneurship and Innovation Management” under the Bachelor of Business Administration programme.
- Baku State University offers the course “Entrepreneurship and Organization of Business” in the Department of Economics and Management.
- ADA University is also offering Entrepreneurship course both in the Bachelor of Business Administration and Master of Business Administration programmes

Several other universities offer degrees in business administration and economics, but not directly targeting entrepreneurship.

Criteria: The percentage of universities that are offering entrepreneurial education programmes:

- **Grade 1:** The percentage of universities offering entrepreneurial education programmes is 6.8% in Azerbaijan (three out of 44 universities), which is about 70% less compared to 78% in the selected East-Central European countries.

Evaluation of the indicator:

- **On performance**: The universities entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R1. Creating universities´ entrepreneurial programmes.
- **High priority**: R2. Empowering universities by implementing specialised entrepreneurial programmes.
- **Low priority**: R3. Boosting universities by implementing high entrepreneurial education.

Table 35. List of universities offering entrepreneurial education programmes in Azerbaijan

#	Name of university offering entrepreneurial education programmes
1	Khazar University
2	ADA University
3	Baku State University

[15] Indicator 1.1 considers entrepreneurial education programmes as per standard curricula of universities.

Indicator 1.2. The quality of technology education centres giving access to educational specialisation in emerging technologies.

According to the country-level assessment, only a few IT schools provide high-tech education to students in the country: CodeAcademy, STEP IT Academy and Tech Academy (*see table below)*. Other successful examples for educational programmes are:

- "Sabah Qruplari" that offers special curriculum classes in more than 5 universities selected from talented students (taught in universities);
- Global Innovation Catalyst (GiC) which just started Stanford Universities Development Centres training in Baku (online programme).

The E-Government Training and Education Centre LLC was established under the Ministry of Communications and High Technologies in 2015 to enhance the level of knowledge of the population, civil servants and employees of state-owned enterprises in information technologies and develop their skills in electronic governance. The main building of the centre is located in Baku city. Also, a total of 17 centres is located in 15 regions throughout the country. The centre possesses international statuses of Cisco Networking Academy and CompTIA Academy. The centre has an HD multimedia studio, the laboratory of Cisco Networking Academy, as well as computer labs on Microsoft system.The Bureau on ICT for Education under the Ministry of Education is the focal point for school informatisation. Provision of ICT to secondary schools has emphasised various government initiatives for the past decade, including supplying computers to schools, developing e-textbooks, providing internet access, and training teachers on ICT use[16].

Criteria: The estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants:

- **Grade 1:** The estimated number of technology education entities per million inhabitants in Azerbaijan is 2 from a total estimated number of tech educational facilities of 20; about 20 centres less compared to 24.4 centres in the selected East-Central European countries.

Evaluation of the indicator:

- **On performance**: The technology education entities offer limited access to emerging technologies specialisation to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R4. Creating technology education centres.
- **Medium priority**: R5. Empowering technology education centres by implementing educational specialisation in emerging technologies.
- **Low priority**: R6. Boosting technology education centres by implementing educational specialisation in emerging technologies.
- **Low priority**: R7. Boosting technology education centres by funding capacity for R&D development.

Table 36. List of technology education centres in Azerbaijan

#	Name of technology education centre	Number of centres
1	Information and Communication Technologies Applying and Training Centre	17 centres
2	Code Academy	1 centre
3	STEP IT Academy	1 centre
4	Tech Academy	1 centre

[16] Asian Development Bank, "Azerbaijan: Country Digital Development Overview", 2019.

KPI 2. Performance of the educators from the idea to the pre-seed stage

Indicator 2.1. The quality of the incubators.

According to the country-level assessment, business incubation processes including training, capacity building, initial financing and other have been promoted by the Azerbaijan government and the establishment of state business incubators has been launched. Currently, there are various incubators that are operated by state bodies. Several higher educational institutions in Azerbaijan also have business incubators. Examples are Azerbaijan Economic University (initiated the Innovative Business Incubator), Azerbaijan Architecture and Construction University (initiated the Innovative Business Incubator Centre), and others (*see table below*).

Azerbaijan's Universities have incubators for social entrepreneurs. Examples are at the Azerbaijan State Oil and Industry University (Eazi Start-up School) and Business Incubation Centre at Azerbaijan National Academy of Sciences (ANAS) High Tech Park. Universities support incubators through access to their laboratories, small investment into equipment, provision of space for the incubation process, and other.

Baku Engineering University also provides a tech park for encouraging the academic staff and students to engage in entrepreneurial activities and networking with the business world[17].

Bakcell, a mobile Operator is offering an incubation programme called BakcellAppLab. AppLab is an accelerated implementation model designed to help selected developers deliver ideas, mobile applications, and technologies from a pilot version to a fully operational version. The programme provides co-working space, 6-month training, technical support and advice, opportunities to participate in local and international events, opportunity to meet investors.

Other incubators offering entrepreneurial programmes for creating start-ups are Youth Incubation Centre, Social Innovation Lab and IBA Innovation.

Criteria: The estimated number of incubators per million inhabitants:

- **Grade 1:** The estimated number of incubators per million inhabitants in Azerbaijan is 0.8 from a total estimated number of eight incubators; 1.6 incubators less compared to 2.04 incubators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active incubators.:

- **Grade 4:** Azerbaijan's active incubators' average operating period is 5.5 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The incubators offer adequate access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R8. Creating incubators.
- **High priority**: R9. Empowering incubators by implementing specialised incubation programmes.
- **Medium priority**: R10. Boosting incubators by implementing "idea-stage" grant schemes.

[17] BEU Technopark and innovation centre, see: https://beu.edu.az/en/page/texnopark-30.

Table 37. List of incubators in Azerbaijan

#	Name of incubator	Founding year
1	Youth Inc Business Incubation Centre	2015
2	Eazi Start-Up School	2015
3	ANAS Business Incubation Centre	2016
4	Azerbaijan Economic University Incubator	2014
5	Azerbaijan Architecture and Construction University Incubator	2015
6	Social Innovation Lab	2016
7	IBA Innovation	2019
8	BakcellAppLab	2014

Indicator 2.2. The quality of the accelerators.

According to the country-level assessment, five accelerators offer business model validation training and other support services for Azerbaijani start-ups.

One of the state's key stakeholders is INNOLAND, an incubation, acceleration, and research centre created to develop the private sector, promote innovation, and expand the start-up movement both in Azerbaijan and beyond its borders. They host around ten start-ups annually. The programme managers claim that their alumni have already raised $0,7 million investment.

Entrepreneurs and start-ups can build the right product and accelerate their growth through a corporate partner rendering Social Innovation Lab's services. They help with market analyses, business model validation and market entry. As mentioned above, the Lab is also offering Idea Validation programmes for entrepreneurs.

Barama Innovation and Entrepreneurship Centre is the first business accelerator in Azerbaijan, created with Azercell Telecom LLC and PASHA Bank's support in 2009. Other accelerators are SUP.vc and Technovate Venture studio. They both provide training, mentorship, events and networking opportunities (*see table below*).

Criteria: The estimated number of accelerators per million inhabitants:

- **Grade 1:** The estimated number of accelerators per million inhabitants in Azerbaijan is 0.5 from a total estimated number of five accelerators; 0.72 accelerators less compared to 1.22 accelerators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active accelerators:

- **Grade 4:** Azerbaijan's active accelerators´ average operating period is 5.4 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The incubators offer adequate access to knowledge to entrepreneurs from the idea stage to the pre-seed stage, in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R11. Creating accelerators.
- **High priority**: R12. Empowering accelerators by implementing specialised pre-acceleration programmes.
- **Medium priority**: R13. Boosting accelerators by implementing seed-stage grant schemes.
- **Medium priority**: R14. Boosting accelerators through access to local and international markets.

Table 38. List of accelerators in Azerbaijan

#	Name of accelerator	Founding year
1	Barama Innovation and Entrepreneurship Centre	2009
2	SUP.vc	2015
3	Technovate Venture studio	2020
4	InnoLand	2018
5	Social Innovation Lab	2016

Indicator 2.3. The existence of international accelerators operating in the country.

According to the country-level assessment, no international incubator or accelerator is physically present in Azerbaijan.

Criteria: The existence of international accelerators operating in the country:

- **Grade 0:** No international accelerators are operating in the Azerbaijani ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no international accelerators in the country´s ICT entrepreneurial ecosystem, offering access to knowledge to start-ups from the pre-seed stage to the seed stage.

Recommendations:

- **High priority**: R15. Attracting international accelerators to the local ecosystem.

KPI 3. Performance of the educators in the seed stage

Indicator 3.1. The existence of mentorship associations.

According to the country-level assessment, the acceleration programmes in Azerbaijan offer access to mentors, but the number of those is around a dozen per accelerator. From the website, we learn that the SUP accelerator has a network of 18 mentors. There is no registered mentorship network or association providing access to local and international mentors for Azerbaijani start-ups.

Criteria: The existence of mentorship associations operating in the country:

- **Grade 0:** No mentorship associations are operating in the Azerbaijani ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no mentorship associations in the country´s ICT entrepreneurial ecosystem, offering access to knowledge to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority**: R16. Creating mentorship associations.
- **Medium priority**: R17. Boosting mentorship associations by implementing access to service providers´ funding capacity.

Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

According to the country-level assessment, a notable contribution to the start-up ecosystem is made by ATL Group, which runs its academy, helps local accelerators and builds tech communities domestically. Nonetheless, they are providing tech education rather than directly entrepreneurial. Apart from that, the private sector is not active in giving entrepreneurial education access.

Criteria: The existence of the private sector´s entrepreneurial programmes operating in the country:

- **Grade 3:** One private sector´s entrepreneurial programme is operating in the Azerbaijani ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The private sector´s entrepreneurial programmes offer limited access to knowledge to start-ups from the pre-seed stage to the early stage, in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R18. Empowering specialised incubation by focusing on digitalisation of the local industry.

Table 39. List of private sector's entrepreneurial programmes in Ukraine

#	Name of the private sector's entrepreneurial programme	Founding year
1	ATL Group	2012

KPI 4. Performance of the investors from the idea to the pre-seed stage

Indicator 4.1. The existence of crowdfunding platforms in the country.

According to the country-level assessment, there is only one crowdfunding platform through which business projects can raise Azerbaijani funds. Wish is a project of Global Innovations LLC. The project's primary goal is to create a platform to attract Azerbaijan business and private investment.

Criteria: The existence of crowdfunding platforms operating in the country:

- **Grade 3:** There is one crowdfunding platform operating in the Azerbaijani ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The crowdfunding platforms offer limited access to capital to start-ups from the idea stage to the early stage, in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R26. Creating crowdfunding platforms.
- **Medium priority:** R27. Empowering crowdfunding platforms through access to a critical mass of investors.

Table 40. List of crowdfunding platforms in Azerbaijan

#	Name of crowdfunding platform
1	Wish.az

KPI 5. Performance of the investors from the seed to the early stage

Indicator 5.1. The quality of the local venture capital firms.

According to the country-level assessment and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries[18], two venture capital firms in Azerbaijan are active in 2020.

Khazar Ventures is a seed investment venture capital firm targeting innovative start-ups in Azerbaijan. They invest in start-ups in their earliest stage of life and support recruiting, business development, knowledge, marketing, and introductions to industry leaders and partners.

The Turkish Bogazici Ventures company has opened a representative office in Azerbaijan. Bogazici Ventures venture fund initially established an investment fund of $5 million to develop Azerbaijani start-ups.

[18] Information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".

For the years 2017-2019, the Azerbaijani start-ups received local VCs investments of around $420,000[19]. The investment size per start-up stage differs a lot.

Criteria: The number of venture capital firms per million inhabitants:

- **Grade 1:** The number of venture capital firms per million inhabitants in Azerbaijan is 0.2 from a total estimated number of two venture capital firms; 1.53 less compared to 1.73 VCs per million inhabitants in the selected East-Central European countries.

Criteria: The average number of investments per local venture capital firms from 2017 to 2020:

- **Grade 2:** The average number of investments per local VC firms in Azerbaijan from 2017 to 2020 is 4.5 from a total nine investments; less than 1.57 compared to the average of 6.07 number of investments in the selected East-Central European countries.

Criteria: The average operating period of the country's active venture capital firms:

- **Grade 3:** The Azerbaijani venture capital firms´ average operating period is four years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R20. Creating venture capital firms.
- **Medium priority:** R19. Empowering venture capital firms through fund of funds programmes.
- **Low priority:** R21. Boosting ventures capital firms through access to international markets.

Table 41. List of local venture capital firms in Azerbaijan

#	Name of local venture capital firm	Founding year	Number of investments since 2017
1	Khazar Ventures	2014	9
2	Bogazici Ventures	2020	0

Indicator 5.2. The existence of international venture capital firms operating in the country.

According to the country-level assessment, the only international venture capital firm in Azerbaijan is the Bogazici Ventures, a Turkish venture fund (*see table above)*.

Criteria: The existence of international venture capital firms operating in the country:

- **Grade 3:** There is one international venture capital operating in the Azerbaijani ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The international venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R22. Attracting international venture capital firms to the local ecosystem

[19] Information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".

Indicator 5.3. The quality of business angels networks.

According to the country-level assessment, and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, there is no registered business angel network in Azerbaijan.

An estimated 10 individual investors in the country are interested primarily in domestic projects, staying behind the scenes and not disclosing their deals. In this research, only 11 deals were found in 2019 (five through the Barama pre-acceleration programme and six independent deals)[20]. There are many wealthy individuals in the country, but they are rarely ready to invest in technological companies. The reasons brought are the lack of quality deal flow, unfamiliar industry and high risks associated with innovations.

For the years 2017-2019, the Azerbaijani start-ups received around $710,000 of investments from local investors (private investors and accelerators).

Criteria: The number of business angels networks per million inhabitants:

- **Grade 0:** No business angels networks are operating in the Azerbaijani ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no business angels networks in the country´s ICT entrepreneurial ecosystem, offering access to capital to start-ups from the pre-seed stage to the seed stage.

Recommendations:

- **High priority:** R23. Creating business angels networks.
- **Low priority:** R24. Empowering business angels networks by strengthening the investment expertise.
- **Low priority:** R25. Boosting business angels networks through co-investment matching programmes.

KPI 6. Performance of the connectors in talent generation

Indicator 6.1. The existence of talent generation events[21].

According to the country-level assessment, the ecosystem stakeholders, including educators, organise mid-size (20-50 participants) events for start-ups for raising awareness on entrepreneurship, networking with the ecosystem, competitions, conferences, etc. Examples are the thematic hackathons by UNDP, Hackathon Azerbaijan and Start-upFest (*see table below)*.

The ecosystem also hosts some international events like Start-up Europe Week, Start-up Grind and Start-up Weekends.

One of the most famous is Yeni Fikir “New Idea” start-up competition, which also provides funding to the winning participants.

Hackathon Azerbaijan is being organised since 2011, and several other hackathons like IBA, GlobalDefTech and EduHack were organised this year.

Other talent attraction events are Innoweek, Fuckup Nights Baku, SUP Talks, Global Games Jam and I2B.

Criteria: The existence of relevant talent generation events in the country:

- **Grade 3:** 14 relevant talent generation events are operating in the Azerbaijani ICT ecosystem.

Criteria: The average operating period of the country’s active talent generation events:

- **Grade 3:** The Azerbaijani talent generation events average operating period is 3.8 years as of the date of this report.

[20] Information collected during the EU4Digital study “Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries”.

[21] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Evaluation of the indicator:

- **Excellent performance**: The talent generation events offer excellent access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R28. Creating talent generation events.
- **Low priority:** R29. Empowering talent generation events through sponsorship.

Table 42. List of talent generation events in Azerbaijan

#	Name of talent generation event	Founding year
1	Start-up Fest	2019
2	Start-up Grind	2019
3	Baku Start-up Weekend	2014
4	Hackathon Azerbaijan	2011
5	Innoweek	2019
6	IBA Hackathon	2020
7	Yeni Fikir	2013
8	Global DefTech Hackathon	2020
9	Fuckup Nights Baku	2018
10	SUP Talks	2015
11	Global Games Jam	2020
12	EduHack Hackathon	2020
13	Start-up Europe Week	2016
14	I2B	2018

KPI 7. Performance of the connectors from the idea to the pre-seed stage

Indicator 7.1. The quality of the entrepreneurial events[22].

According to the country-level assessment, the Azerbaijani entrepreneurial ecosystem hosts a few relevant events for start-ups (*see table below*).

WorldNet Summit is where the founders and CEOs of technology companies, fast-growing start-ups, policymakers and game-changers go live together to discuss and build the future of technology. The event hosts participants from around 80 countries with more than 100 speakers.

Start-upFest is a one-week event composed of international events like Techstars Start-up Weekend Fintech, DevopsDays, Product Hunt Meetup, TEDx. The event brings together young tech entrepreneurs, angel investors, corporates, government structures, universities, media and international guests from different countries.

Falcon Summit is a three-day event aiming to demonstrate the innovative project of start-ups working in various fields in front of investors, discuss the funding opportunities and showcase investment potential in Azerbaijan.

[22] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Criteria: The number of entrepreneurial events per million inhabitants:

- **Grade 1:** The estimated number of entrepreneurial events per million inhabitants in Azerbaijan is 0.3 from a total estimated number of three events; 1.22 less compared to 1.52 entrepreneurial events per million inhabitants in the selected East-Central European countries.

Criteria: The average estimated number of attendees per entrepreneurial event:

- **Grade 1:** The average number of attendees per entrepreneurial event in Azerbaijan is 750; 1,450 smaller compared to 2,200 average number of attendees per entrepreneurial event in the selected East-Central European countries.

Criteria: The average operating period of the country's active entrepreneurial events:

- **Grade 2:** The Azerbaijani entrepreneurial events average operating period is 2.4 years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The entrepreneurial events offer limited access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R30. Creating entrepreneurial events.
- **Medium priority:** R31. Empowering entrepreneurial events through sponsorship.
- **Low priority:** R32. Boosting entrepreneurial events through internationalisation.

Table 43. List of entrepreneurial events in Azerbaijan

#	Name of entrepreneurial event	Founding year	Number of participants in 2019
1	Falcon Summit	2019	500
2	Start-upFest	2019	1,000
3	World Net Summit	2019	Unknown

Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem.

According to the country-level assessment, there are three media channels through which the Azerbaijani entrepreneurs can learn ecosystem news and opportunities. Those are the Technote, Techland and the YouTube channel ARB 24 (*see table below*).

There are no local databases in the country, which provide aggregated information of the local ecosystem players and activities.

Criteria: The existence of specialised entrepreneurial media in the country:

- **Grade 3:** Three specialised entrepreneurial media are operating in the Azerbaijani ICT ecosystem.

Criteria: The existence of relevant ICT entrepreneurial ecosystem databases:

- **Grade 0:** There are no ICT entrepreneurial ecosystem´s databases operating in the Azerbaijani ICT ecosystem.

Criteria: The average operating period of the country's active specialised entrepreneurial media and databases:

- **Grade 4:** The country's specialised entrepreneurial media and databases' average operating period is five years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R33. Creating ICT ecosystem databases.

Table 44. List of specialised entrepreneurial media in Azerbaijan

#	Name of specialised entrepreneurial media	Founding year
1	Technote	2015
2	Techland	2019
3	ARB24 (Section "Start-up")	2014

KPI 8. Performance of the connectors from the seed to the early stage

Indicator 8.1. The existence of investment forums.

According to the country-level assessment, only the "Falcons Summit Baku" was held as an Azerbaijan investment forum (*see table below*).

"Falcons Summit Baku" is a conference of investors, start-ups, entrepreneurs, corporation executives, representatives of small and medium-sized businesses from GCC countries (Kuwait, Saudi Arabia, Qatar, UAE and Oman). The event created a networking platform for investors. They also had a chance to look through investment opportunities in Azerbaijan.

In 2019, the Azerbaijani delegation attended the Business and Investment Forum of the Member States of the Cooperation Council of Turkic-Speaking States. The event hosted around 400 participants from Turkish-speaking countries to discuss mutual interests and investment opportunities[23].

Criteria: The existence of investment forums in the country:

- **Grade 3:** One investment forum is operating in the Azerbaijani ICT ecosystem.

Criteria: The average operating period of the country's active investment forums:

- **Grade 1:** The Azerbaijani investment forums average operating period is one year as of the date of this report.

Evaluation of the indicator:

- **On performance**: The investment forums offer limited access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R34. Creating investment forums.
- **Medium priority:** R35. Empowering investments forums through sponsorship.
- **Low priority:** R36. Boosting investments forums through internationalisation.

Table 45. List of investment forums in Azerbaijan

#	Name of investment forum	Founding year
1	Falcon Summit	2019

[23] More about the Business and Investment Forum: http://ask.org.az/en/2020/06/03/9833/.

Indicator 8.2. The existence of national trade fairs and business forums[24].

According to the country-level assessment, the country is organising several trade shows and expos for different industries (*see table below*). Examples are Travel and Tourism Fair, Begin Edu Fair, InterFood Azerbaijan, International Food Industry Expo and Agricultural Expo, HOREX, Bakutel, and International Conference on Science, Engineering and Technology. The number of attendees for the fairs exceeds thousands with guests from the region. The country is also hosting international and regional fairs mostly on the energy industry.

Criteria: The existence of national trade fairs and business forums in the country:

- **Grade 3:** Eight national trade fairs and business forums are operating in the Azerbaijani ICT ecosystem.

Criteria: The average operating period of the country's active national trade fairs and business forums:

- **Grade 4:** The Azerbaijani national trade fairs and business forums average operating period is 9.5 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The national trade fairs and business forums offer optimal access to the market to start-ups from the seed stage to the early stage, in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Medium priority:** R37. Empowering business forums by connecting private sector with ICT ecosystem.
- **High priority:** R38. Boosting the promising start-ups through access to international trade fairs.

Table 46. List of trade fairs and business forums in Azerbaijan

#	Name of trade fair or business forum	Founding year
1	Begin Edu Fair	2019
2	International Trade Fair for Travel and Tourism	2003
3	International Food Industry Expo	2017
4	International Agriculture Exhibition	2008
5	Caucasus International Hospitality Exhibition	2007
6	InterFood Azerbaijan	2017
7	International Conference on Science, Engineering and Technology	2018
8	Bakutel	1995

KPI 9. Performance of the facilitators in the idea stage

Indicator 9.1. The quality of tech facilities to support the start-up creation.

According to the country-level assessment, several tech parks and labs are dedicated mostly to research activities. The government is also committing some funds for creating new tech facilities. According to the country-level assessment, the start-ups can use four tech parks for developing new products. Those are the Western University Technopark, the Azerbaijan National Academy of Sciences (ANAS) Tech Park, the Sumqayit Technology Park and the Baku Engineering University Technopark.

[24] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Criteria: The number of tech facilities per million inhabitants:

- **Grade 1:** The estimated number of tech facilities per million inhabitants in Azerbaijan is 0.4 from a total estimated four tech facilities; 0.92 less compared to 1.32 tech facilities per million inhabitants in the selected East-Central European countries.

Criteria: The average number of annually founded spin-offs per tech facility:

- **Grade 3:**The average number of yearly founded spin-offs per tech facilities in Azerbaijan from 2017 to 2020 is 2.5 that is 0.47 more compared to 2.03 yearly founded spin-offs per tech facilities in the selected East-Central European countries from 2017 to 2020.

Criteria: The average operating period of the country's active tech facilities:

- **Grade 4:** The Azerbaijani tech facilities average operating period is ten years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R39. Creating tech parks.
- **Medium priority:** R40. Empowering tech facilities through technology clustering.

Table 47. List of tech facilities in Azerbaijan

#	Name of tech facility	Spin-Offs/Year	Founded Year	Free Working Space	Laboratories	Access to Interns
1	Baku Engineering University Technopark	10	2013	Yes	Yes	Yes
2	Western University Technopark	0	2017	Yes	Yes	Yes
3	Azerbaijan National Academy of Sciences (ANAS) Tech Park	0	2016	Yes	Yes	Yes
4	Sumqayit Technology Park	0	2009	Yes	Yes	Yes

Indicator 9.2. The existence of tech facilities to support the start-up creation in small urban and rural areas.

According to the country-level assessment, there are two tech facilities in urban and rural areas in Azerbaijan: Sumgayit Technology Park and Azerbaijani National Academy of Sciences (ANAS) High Tech Park (*see the table above*).

Criteria: The existence of tech facilities in operating in the country's small urban and rural areas:

- **Grade 3:** Two tech facilities in small urban and rural areas operating in the Azerbaijani ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The tech facilities in small urban and rural areas offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R42. Creating tech parks in small urban areas.

KPI 10. Performance of the facilitators from the pre-seed to the early stage

Indicator 10.1. The existence of business facilities to support the start-up development.

According to the country-level assessment, six business centres offer compliant facilities and services for the start-ups. Some of the best places for entrepreneurs to reside are Lotfizadeh Technology Centre, Barama offices, Innoland centres in Baku and Sheki, Baku Business Factory, The Office and COLAB.

Criteria: The existence of business facilities in the country:

- **Grade 3**: Six business facilities are operating in the Azerbaijani ICT ecosystem.

Criteria: The country's active business facilities average operating period:

- **Grade 4:** The Azerbaijani business facilities average operating period is five years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The business facilities offer optimal access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R41. Boosting the promising start-ups through access to business centres.

Table 48. List of co-working spaces and business centres in Azerbaijan

#	Name of co-working space or business centre	Founding year
1	Lotfizadeh Technology Centre	2019
2	Innoland	2018
3	Colab	2017
4	The Office	2018
5	Barama Innovation & Entrepreneurship Centre	2009
6	Baku Business Factory	2015

Involvement of the public sector in the development of the ecosystem

The level of involvement of the public entities, such as government, development agencies and international organisations, is key for the ecosystem's growth. Although these entities performance is not evaluated in this analysis, the authors summarise their involvement in the ICT entrepreneurial ecosystem's development in the sections below.

International organisations

According to the country-level assessment, there is no specific involvement of international organisations and donors in ICT entrepreneurial ecosystem development in Azerbaijan as of today.

According to the United Nations Conference on Trade and Development (UNCTAD) data, Azerbaijan received around $1,5 billion in foreign direct investment in 2019[25]. However, those are targeting socio-economic fields and not IT and entrepreneurship.

Government as an ecosystem builder

According to the country-level assessment, in 2018, the Innovation Agency was created under the Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan. This new body was created

[25] UNCTAD, World Investment Report 2020, see: https://unctad.org/system/files/official-document/wir2020_en.pdf.

based on two existing institutions – the State Fund for Development of Information Technologies and the High-Tech Park. It provides business incubation, access to mentors, facilities and funding for entrepreneurs and start-ups.

InnoLand was launched in November 2018 by the State Agency for Public Service and Social Innovations. InnoLand features a "fab lab," co-working space, incubator, research and development centre, and tech academy.

The state programme "Azerbaijani Youth" for 2017-2021 also includes various activities for promoting youth entrepreneurship. According to the State programme on Youth and Azerbaijan 2020 Concept, various business incubators have been established in Azerbaijan.

Table 49. List of governmental entrepreneurial programmes in Azerbaijan

#	Name of governmental entrepreneurial programme	Founding year	Fund size
1	Innovation Agency	2019	Unknown
2	InnoLand	2018	Unknown
3	Azerbaijani Youth	2017	Unknown

Government as a regulator

According to the country-level assessment, the digital infrastructure of governmental services is well-established. In Azerbaijan, submitting tax filings is possible online. Also, the tax regime for SMEs is very favourable. Residents of tech parks enjoy a tax exemption for seven years. Since 2019, the country has introduced a start-up certification system. However, the process of getting this certificate is complicated, and no start-up has received the certificate since the establishment of the system in early 2019 as of the date of this report. Azerbaijan provides VAT exemption regimes (18% for the country) based on relevant documentary evidence and penalties for non-compliance: residents of special economic zones/industrial parks for 5 years for imported goods; SME cluster companies for 7 years for machinery, technological equipment and devices imported for production and processing; some categories of imported goods are exempt from VAT as defined by the Cabinet of Ministers.

Corporate income-tax (20%) in the case of a foreign taxpayer is 10% with exceptions: for residents of industrial and technological parks - 0% for 7 years; for SME Cluster Participant from the supply of goods/works/services under the contract with the SME Cluster Company, which is directed to the CAPEX (Capital Expenditure), is 0% for 7 years.

According to the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries[26], laws supporting venture capital investments in Azerbaijan are not very well established. For example, commonly used Simple Agreement for Future Equity (SAFE) and convertible notes are not valid within the local legislation. Another limitation that repulses foreign investors is that whenever the national economy faces a crisis, the government blocks foreign currency transactions, which is not satisfactory for running an international business.

Even through there are some number of unregulated areas of innovative funding, such as venture funding, fintech crowdfunding and other, the Innovation Policy is being designed[27]: public entities and related institutions (e.g. ministries, innovation centres, IT academies, and other) are being reorganised to support innovation development in Azerbaijan.

Azerbaijan joined World Intellectual Property Organization (WIPO) in 1995, is a member of 67 treaties and approved 21 treaties on Intellectual Property Rights. Intellectual Property Agency of the Republic of Azerbaijan as the legal entity of public law was created in 2018. The agency functions with the support of the state budget and collects small fees from trademarks. An online system for submitting applications is currently built. Due to the recent establishment of the agency in Azerbaijan, using the Patent Cooperation Treaty (PCT) application, which simplifies the application process and allows one application to be filed for patent protection in multiple countries, is still impossible.

[26] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".
[27] Innovation policy in Azerbaijan: https://unece.org/circular-economy/press/spurring-innovation-will-be-central-diversifying-azerbaijans-economy.

5.3. Recommendations by priority in Azerbaijan

Below the experts list the **high and medium priority** recommendations necessary to empower the ICT entrepreneurial ecosystem of Azerbaijan.

Also, the detailed list of all main recommendations for capacity builders acting in the six Eastern Partnership countries can be found in Chapter 11.

Table 50. Priority recommendations for empowering the Azerbaijani ICT entrepreneurial ecosystem

Recommendation	Priority	Area	Stage
R1. Creating universities´ entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R2. Empowering universities by implementing specialised entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R4. Creating technology education centres	HIGH	KNOWLEDGE	IDEA
R5. Empowering technology education centres by implementing educational specialisation in emerging technologies	MEDIUM	KNOWLEDGE	IDEA
R9. Empowering incubators by implementing specialised incubation programmes	HIGH	KNOWLEDGE	PRE-SEED
R10. Boosting incubators by implementing “idea-stage” grant schemes	MEDIUM	KNOWLEDGE	PRE-SEED
R12. Empowering accelerators by implementing specialised pre-acceleration programmes	HIGH	KNOWLEDGE	SEED
R13. Boosting accelerators by implementing seed-stage grant schemes	MEDIUM	KNOWLEDGE	SEED
R14. Boosting accelerators through access to local and international markets	MEDIUM	KNOWLEDGE	SEED
R15. Attracting international accelerators to the local ecosystem	HIGH	KNOWLEDGE	SEED
R16. Creating mentorship associations	HIGH	KNOWLEDGE	EARLY
R17. Boosting mentorship associations by implementing access to service providers´ funding capacity	MEDIUM	KNOWLEDGE	EARLY
R18. Empowering specialised incubation by focusing on digitalisation of the local industry	HIGH	KNOWLEDGE	EARLY
R19. Empowering venture capital firms through fund of funds programmes	MEDIUM	CAPITAL	EARLY
R20. Creating venture capital firms	HIGH	CAPITAL	EARLY

Recommendation	Priority	Area	Stage
R22. Attracting international venture capital firms to the local ecosystem	HIGH	CAPITAL	EARLY
R23. Creating business angels networks	HIGH	CAPITAL	SEED
R26. Creating crowdfunding platforms	HIGH	CAPITAL	PRE-SEED
R27. Empowering crowdfunding platforms through access to a critical mass of investors	MEDIUM	CAPITAL	PRE-SEED
R30. Creating entrepreneurial events	HIGH	MARKET	PRE-SEED
R31. Empowering entrepreneurial events through sponsorship	MEDIUM	MARKET	PRE-SEED
R33. Creating ICT ecosystem databases	HIGH	MARKET	SEED
R34. Creating investment forums	HIGH	MARKET	SEED
R35. Empowering investments forums through sponsorship	MEDIUM	MARKET	SEED
R37. Empowering business forums by connecting private sector with ICT ecosystem	MEDIUM	MARKET	EARLY
R38. Boosting the promising start-ups through access to international trade fairs	HIGH	MARKET	EARLY
R40. Empowering tech facilities through technology clustering	MEDIUM	RESOURCES	IDEA
R41. Boosting the promising start-ups through access to business centres	HIGH	RESOURCES	EARLY
R42. Creating tech parks in small urban areas	HIGH	RESOURCES	IDEA

Chapter 6: BELARUS

This diagnosis of the performance of the ICT entrepreneurial ecosystem stakeholders in Belarus is structured in the following manner:

1. Current status of ICT entrepreneurial ecosystem performance through comparison of the conversion ratios of ICT start-ups in different growth stages with select European and other countries.
2. Diagnosis of the performance of the different ecosystem stakeholders: educators, investors, connectors and facilitators by evaluating 19 indicators *(see Chapter 3).*
3. Prioritisation of the main recommendations for further developing the ICT entrepreneurial ecosystem in Belarus.

The detailed methodology of the diagnosis is provided in Chapter 1.

6.1. Status of the ICT Entrepreneurial Ecosystem in Belarus

This subchapter provides information on:

1. Start-ups strength, by providing the comparison of the start-ups conversion ratios from the idea stage to the early stage with selected European and other more matured ecosystems.
2. Ecosystems stakeholders status in the different stages of the start-ups' lifecycle.

To analyse the maturity of the ICT entrepreneurial ecosystem in Belarus, first the strength of the start-ups according to the conversion ratios from the idea stage to the early stage, was compared with the ratios of the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania). These countries have been selected due to relevant similarities with the Eastern partner countries such as ICT ecosystem size, targeted IT industries and their size, historical and cultural development path. In addition, the experts have compared the conversion ratios of the Belarus start-ups with well-developed ecosystems of four selected Western European countries (Germany, France, United Kingdom and Spain), as well as with more mature ecosystems like California (Silicon Valley) and Israel *(see tables below).*

The conversion ratios have been calculated based on the information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries" and the largest ICT entrepreneurial databases Dealroom and CrunchBase. The latter sources provide information on a large number of start-ups and investment rounds to calculate the conversion ratios that are close to reality. However, the reader should bear in mind that the mentioned sources do not provide comprehensive data on all start-ups operating in the compared countries, especially in the idea and pre-seed stages, where start-ups have not yet received investments. Also, these sources do not collect the information on start-ups in the early to scale-up stage that have grown without the need for external investments. Nevertheless, these estimated ratios include a significant sample of companies, allowing to make an assumption about the actual conversion ratios of the start-ups in the country.

The experts have compared the conversion ratios of the Belarus start-ups and other selected countries and the differences are provided in the tables below.

Table 51. ICT conversion ratios compared with selected East-Central European countries

#	Country	Ratio idea to pre-Seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**EAST-CENTRAL EUROPE AVERAGE**	**0,06%**	**12,54%**	**4,24%**	**0,64%**	**0,19%**
1.1	**LITHUANIA**	0,11%	14,23%	4,84%	0,79%	0,30%
1.2	**ESTONIA**	0,06%	12,49%	4,96%	0,53%	0,14%
1.3	**POLAND**	0,04%	11,91%	3,21%	1,25%	0,27%
1.4	**BULGARIA**	0,05%	12,26%	4,56%	0,28%	0,11%
1.5	**ROMANIA**	0,04%	11,79%	3,64%	0,36%	0,14%
2	**BELARUS**	**0,03%**	**5,61%**	**1,20%**	**0,29%**	**0,07%**
2-1	**DIFFERENCE**	**-51,10%**	**-55,25%**	**-71,66%**	**-54,38%**	**-61,88%**

Table 52. Conversion ratios compared with selected Western European countries

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**WESTERN EUROPE AVERAGE**	**0,11%**	**15,94%**	**4,66%**	**1,47%**	**0,59%**
1.1	**GERMANY**	0,06%	16,60%	5,13%	2,09%	0,79%
1.2	**FRANCE**	0,06%	15,92%	4,87%	1,93%	0,67%
1.3	**UNITED KINGDOM**	0,21%	16,23%	5,32%	1,27%	0,63%
1.4	**SPAIN**	0,10%	15,01%	3,31%	0,58%	0,27%
2	**BELARUS**	**0,03%**	**5,61%**	**1,20%**	**0,29%**	**0,07%**
2-1	**DIFFERENCE**	**-73,55%**	**-64,81%**	**-74,18%**	**-80,17%**	**-87,62%**

Table 53. Conversion ratios compared with California and Israel

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**CALIFORNIA**	0,73%	22,23%	4,89%	2,43%	0,68%
2	**ISRAEL**	0,26%	23,21%	6,11%	3,66%	0,72%
3	**BELARUS**	**0,03%**	**5,61%**	**1,20%**	**0,29%**	**0,07%**
3-(1+2)	**DIFFERENCE**	**-97,05%**	**-87,65%**	**-89,07%**	**-95,21%**	**-94,78%**

As illustrated in the tables above, the Belarusian start-ups' conversion rates are significantly lower in almost all stages than the ecosystems in East-Central and Western European countries and Silicon Valley.

However, Belarusian start-ups conversion ratio from the idea stage to the pre-seed stage is significantly lower than the conversion ratio of the selected East-Central Europe countries. Thus, there are difficulties in the ecosystem for talented entrepreneurs to start working on their business ideas. Also, the start-ups conversion ratio from seed stage to early stage is significantly lower due to the difficulties to grow internationally.

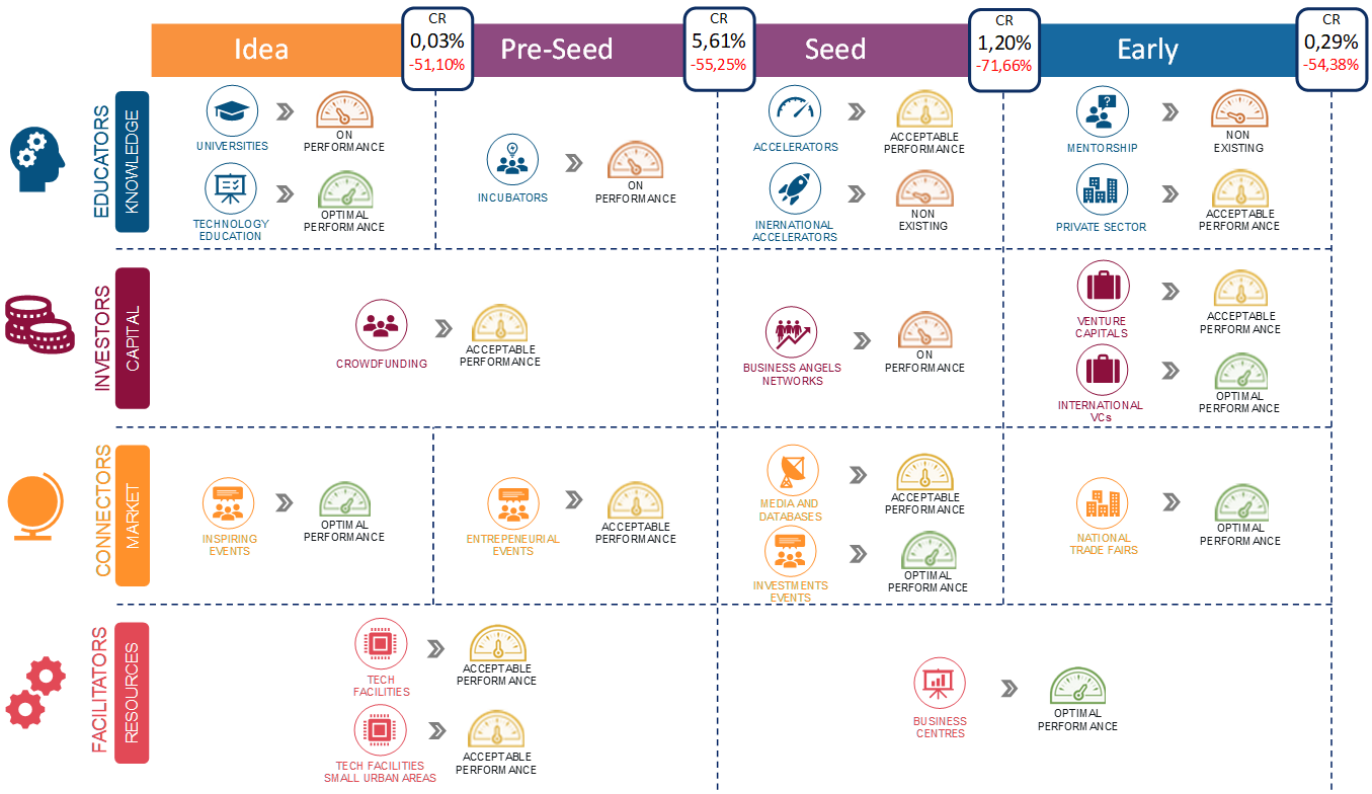
The conversion ratios are impacted by the ecosystem stakeholders involvement in start-ups' development and growth. The diagnosis below analyses the performance of those stakeholders that support start-ups' growth from the idea stage to the early stage. Once the start-up becomes a company with international perspectives or scale-up, the local entrepreneurial ecosystem stakeholders relevance is reduced, and start-up growth is ensured by its own resources.

The figure below presents the level of stakeholders' performance at each stage of the start-ups growth. It was developed to offer the reader a clear view of the main strengths and weaknesses of the ICT entrepreneurial ecosystem in Belarus. The figure provides information on:

1. The conversion ratios (CR) of Belarus ecosystem start-ups from idea to early stage.
2. The difference in the Belarus start-ups' conversion ratios compared with the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania) from idea to early stage.
3. The ecosystem status by stakeholder type (from educators to facilitators) and start-up growth stage (from the idea stage to the early stage).

The majority of the stakeholders are involved in several stages of the start-up lifecycle, but in the figure, they are assigned only to the stages their involvement is the most active.

Figure 14. Belarusian ICT entrepreneurial ecosystem performance status (CR – conversion ratio)



The performance of the stakeholders at each growth stage of the start-ups are evaluated below.

Idea stage: 0.03% Conversion ratio from the idea stage to pre-seed stage

The conversion ratio of the Belarusian individuals having a business idea to entrepreneurs creating a start-up in a pre-seed stage is 0.03%; the ratio is about 51.10% smaller compared to the 0.06% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the idea stage is provided in the table below.

Table 54. Stakeholders´ performance in the idea stage

#	Indicator	Performance	Explanation
1.	Indicator 1.1. The quality of universities´ entrepreneurial education programmes	*On performance*	The universities' entrepreneurial educational programmes offer limited access to knowledge to talented individuals, in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 1.2. The quality of technology education centres giving access to specialisation in emerging technologies	*Optimal performance*	The technology education entities offer optimal access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 6.1. The existence of talent generation events	*Optimal performance*	The talent generation events offer optimal access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 9.1. The quality of the tech facilities to support the start-up creation	*Acceptable performance*	The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 9.2. The existence of the tech facilities to support the start-up creation in small urban and rural areas	*Acceptable performance*	The tech facilities in small urban and rural areas offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Pre-seed stage: 5.61% Conversion ratio from the pre-seed stage to seed stage

The conversion ratio of the Belarusian start-ups from the pre-seed stage to the seed stage is 5.61%; the ratio is around 55.25% smaller compared to the 12.54% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the pre-seed is provided in the table below.

Table 55. Stakeholders´ performance in the pre-seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.1. The quality of the incubators	*On performance*	The incubators offer limited access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 4.1. The existence of crowdfunding platforms in the country	*Acceptable performance*	The crowdfunding platforms offer adequate access to capital to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 7.1. The quality of the entrepreneurial events	*Acceptable performance*	The entrepreneurial events offer adequate access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Seed stage: 1.20% Conversion ratio from the seed stage to early stage

The conversion ratio of the Belarusian start-ups from the seed stage to the early stage is 1.20%; the ratio is about 71.66% smaller compared to the 4.24% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at seed stage is provided in table below.

Table 56. Stakeholders´ performance in the seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.2. The quality of the accelerators	*Acceptable performance*	The accelerators offer adequate access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 2.3. The existence of international accelerators operating in the country	*Non-existent*	There are no international accelerators in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the pre-seed stage to the seed stage.
3.	Indicator 5.3. The quality of business angels networks	*On performance*	The business angel networks offer limited access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 7.2. The existence of specialised entrepreneurial media and databases	*Acceptable performance*	The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.1. The existence of investment forums	*Optimal performance*	The investment forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Early stage: 0.29% Conversion ratio from the early stage to scale-up

The conversion ratio of the Belarusian start-ups from the early stage to scale-up is 0.29%; the ratio is about 54.38% smaller compared to the 0.64% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at early stage is provided in table below.

Table 57. Stakeholders´ performance in the early stage

#	Indicator	Performance	Explanation
1.	Indicator 3.1. The existence of mentorship associations	*Non-existent*	There are no mentorship associations in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the seed stage to the early stage.
2.	Indicator 3.2. The existence of the private sector´s entrepreneurial programmes	*Acceptable performance*	The private sector´s entrepreneurial programmes offer adequate access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 5.1. The quality of the local venture capital firms	*Acceptable performance*	The venture capital firms offer adequate access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 5.2. The existence of international venture capital firms operating in the country	*Optimal performance*	The international venture capital firms offer optimal access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.2. The existence of national trade fairs and business forums	*Optimal performance*	The national trade fairs and business forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
6.	Indicator 10.1. The existence of the business facilities to support the start-up development	*Optimal performance*	The business facilities offer optimal access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

6.2. Diagnosis of the maturity of the ICT entrepreneurial ecosystem in Belarus

The diagnosis below evaluates the performance of the ICT entrepreneurial ecosystem´s stakeholders' in Belarus such as educators, investors, connectors and facilitators. The evaluation is based on an analysis of 19 indicators graded from 0 to 4 (*see Annex 1: Indicator´s evaluation criteria*). Following that, the conclusions on current performance and recommendations for improvement are provided, excluding evaluation of the regulators / public sector performance (*for more explanations see the methodology in Chapter 1*).

KPI 1. Performance of the educators in talent generation

Indicator 1.1. The quality of universities´ entrepreneurial education programmes[28].

According to the country-level assessment, three universities in Belarus offer entrepreneurship-related courses to their students:

- Belarusian State University (BSU) is the country's leading educational establishment. Institute of Business of BSU is implementing a course on venture capital. The Faculty of International Relations of the BSU and the Faculty of Economics have programmes related to entrepreneurship.
- Belarusian National Technical University has a programme dedicated to Cryptocurrencies in the Faculty of Marketing, Management and Entrepreneurship.
- Institute of Management and Entrepreneurship is a private higher education institution located in Minsk. It offers bachelor's degrees in several study areas.

Criteria: The percentage of universities that are offering entrepreneurial education programmes:

- **Grade 1**: The percentage of universities offering entrepreneurial education programmes is 6.25% in Belarus (three out of 48 universities), around 70% smaller compared to 78% in the selected East-Central European countries.

Evaluation of the indicator:

- **On performance**: The universities entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R1. Creating universities´ entrepreneurial programmes.
- **High priority**: R2. Empowering universities by implementing specialised entrepreneurial programmes.
- **Low priority**: R3. Boosting universities by implementing high entrepreneurial education.

Table 58. List of universities offering entrepreneurial education programmes in Belarus

#	Name of university offering entrepreneurial education programmes
1	Belarusian State University
2	Belarusian National Technical University
3	Institute of Management and Entrepreneurship

Indicator 1.2. The quality of technology education centres giving access to educational specialisation in emerging technologies.

According to the country-level assessment, the Belarusian universities have strong competencies in science, technology, engineering, and mathematics (STEM) and are exceptionally well connected and have nurtured a

[28] Indicator 1.1 considers entrepreneurial education programmes as per standard curricula of universities.

culture of education for many decades. Belarusian universities have specialised STEM faculties with more than 70 IT specialties. In 2020, around 22% of all students enrolled in technological disciplines[29].

60.5% of IT specialists are engaged in outsourcing services. More than 90% of the software produced in the High-Tech Park Belarus is exported[30]. At the same time, outsourcing companies tend to partner with local universities in order to make more programmers of all levels available on the market. This generates an overall positive impact both in quantity (increased workforce) and quality (increased skills and shared expertise)[31].

Belarusian software development service companies tend to develop digital deep tech competencies in-house. This tends to create a favourable ground for further digital high-tech start-up development in the country. Several big IT companies have a presence in Belarus. International giants such as Google, Viber and Yandex also have R&D centres. A number of local software companies conduct substantial research and business activity in the field of high-tech. Among the notable cases are Wargaming, EPAM, InDataLab, IHC Markit, ScienceSoft, Altoros and Synesis.

There are many of IT educational centres and training courses by private schools and academies. Some of the most significant examples include Belhard Academy, IT Academy by High-Tech Park, QA Academy, etc. (*see also table below*).

From 2016 to 2019, the total number of the Hi-Tech Park (HTP) resident companies operating in the ICT sector has risen by 26%. One of the activities of the companies carrying the HTP resident status is to organise educational programmes in ICT, and others[32].

Criteria: The estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants:

- **Grade 3:** The number of technology education entities per million inhabitants in Belarus is 16 from a total number of tech educational facilities of 140; 9.4 centres less compared to 24.4 centres in the selected East-Central European countries.

Evaluation of the indicator:

- **Optimal performance**: The technology education entities offer optimal access to emerging technologies specialisation to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R4. Creating technology education centres.
- **Medium priority**: R5. Empowering technology education centres by implementing educational specialisation in emerging technologies.
- **High priority**: R6. Boosting technology education centres by implementing educational specialisation in emerging technologies.
- **High priority**: R7. Boosting technology education centres by funding capacity for R&D Development.

[29] Bulba Ventures, CIVITTA Belarus, Tech in the New East: Belarus, 2020. For publicly available report see: https://bulba.com/.
[30] For more see official website of the Republic of Belarus: https://www.belarus.by/ru/business/doing-business/it-belarus.
[31] Information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".
[32] EY, Doing Business in Belarus 2020: https://www.ey.com/en_by/doing-business-in-belarus.

Table 59. List of technology education centres in Belarus

#	Name of technology education centre	Number of centres
1	Belhard Academy	1 centre
2	IT Academy by High Tech Park	1 centre
3	EPAM Training Centre	1 centre
4	QA Academy	1 centre
5	Softline School	1 centre
6	InDataLab Belarus	1 centre
7	ITransition training centre	1 centre
8	IT Step private school	1 centre
9	Institute IBA	1 centre
10	IT Courses private school	1 centre
11	Edu Softline private school	1 centre
12	Issoft training centre	1 centre
13	Wargaming	1 centre
14	Science Soft	1 centre
15	Altoros	1 centre
16	Synesis	1 centre

KPI 2. Performance of the educators from the idea to the pre-seed stage

Indicator 2.1. The quality of the incubators.

According to the country-level assessment, four incubators offer incubation programmes and facilities for the tech start-ups in Belarus (*see table below*).

With its high-tech focus, High Tech Park also has its incubator. The business incubator offers digital high-tech start-ups an office on favourable rental terms, expert and consultancy support and the possibility of interaction with investors from the IT industry.

The Start-up Hub Imaguru helps to develop the ecosystem of technological start-ups in Belarus and Europe: it offers co-working space to innovative entrepreneurs, holds educational events and meet-ups, provides access to a large community of venture market representatives of the country, organises large field-specified conferences (GEW Belarus, Venture Day Minsk).

“Future is with us” business incubator offers help to start-ups starting from the organisation of working space, providing accounting and juridical services to attracting investments to the project.

In February 2019, Spanish incubator Demium came to Belarus, giving privileged attention to high-tech projects. The incubator offers high-tech ideas that have already proven themselves in different markets. The entrepreneurs also have access to mentors, especially to the international mentors.

According to the Ministry of Economy, there are around 20 business incubators in small urban and rural areas that do not offer entrepreneurial programmes such as ‘Idea Validation’ training, team building, etc. Those are mostly serving as affordable facilities for small family businesses, like production, tourism or similar.

Criteria: The estimated number of incubators per million inhabitants:

- **Grade 1**: The number of incubators per million inhabitants in Belarus is 0.42 from a total number of four incubators; 1.62 less incubators compared to 2.04 incubators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active incubators:

- **Grade 4:** Belarusian active incubators' average operating period is 5.2 years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The incubators offer limited access to knowledge to entrepreneurs from the idea stage to the pre-seed stage, in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R8. Creating incubators.
- **Medium priority**: R9. Empowering incubators by implementing specialised incubation programmes.
- **Low priority**: R10. Boosting incubators by implementing "idea-stage" grant schemes.

Table 60. List of incubators in Belarus

#	Name of incubator	Founding year
1	High Tech Park incubator	2015
2	Imaguru	2013
3	Future is with us	2016
4	Demium	2019

Indicator 2.2. The quality of the accelerators.

According to the country-level assessment, nine accelerators operate in Belarus's in 2020 (*see table below*). Nearly all of them are owned by the private sector, thus providing market and mentors access to the start-ups.

Founded in 2013, TechMinsk Accelerator is the first accelerator in the country, focusing on high-tech start-ups. From 2017 to 2020, over 200 participants from 90 start-ups graduated TechMinsk. The alumni have already attracted over $7 million in investments. Currently, the accelerator's batches are focused on AI, SaaS, blockchain, gaming and data-driven start-ups.

Start-up Hub is an acceleration programme created by the Rocket DAO expert community. A Belarusian business angels network AngelsBand in partnership with an investment company Volat Capital aim to teach and prepare start-ups to attract investments. They attract around 20 entrepreneurs annually and note that about 70% of them start generating sales upon completing the programme. As of date of this report, their start-ups have attracted $0,6 million in investments.

Bridgio Tech Accelerator helps engineering teams grow commercially successful businesses in the global marketplace. They offer hardware tools and infrastructure, marketing support, investment and organise various meet-ups. The accelerator has offices in Minsk and Vilnius, Lithuania.

Criteria: The estimated number of accelerators per million inhabitants:

- **Grade 2**: The number of accelerators per million inhabitants in Belarus is one from a total number of nine accelerators; 0.22 less accelerators compared to 1.22 accelerators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active accelerators:

- **Grade 4**: Belarusian active accelerators´ average operating period is 5.4 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The accelerators offer adequate access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R11. Creating accelerators.
- **High priority**: R12. Empowering accelerators by implementing specialised pre-acceleration programmes.
- **Medium priority**: R13. Boosting accelerators by implementing seed-stage grant schemes.
- **Medium priority**: R14. Boosting accelerators through access to local and international markets.

Table 61. List of accelerators in Belarus

#	Name of accelerator	Founding year
1	Tech Minsk Accelerator	2013
2	Start-up Hub	2019
3	Launch Me	2018
4	FTH.BY	2018
5	InSight TDI	2017
6	VTB Fintech Accelerator	2018
7	Elevator Lab	2018
8	Krokit	2016
9	Bridgio Tech Accelerator	2019

Indicator 2.3. The existence of international accelerators operating in the country.

According to the country-level assessment, there are a few acceleration programmes backed by international companies in the Belarusian start-up ecosystem, mostly banks that also provide access to their programme branches in other countries. The Bridgio Tech Accelerator also has an office in Vilnius, Lithuania.

The only international educator in Belarus is the Spanish incubator Demium. However, Demium closed its offices in Minsk in December 2020 and is operating remotely from Spain.

Criteria: The existence of international accelerators operating in the country:

- **Grade 0**: No international accelerators are operating in the Belarusian ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no international accelerators in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the pre-seed stage to the seed stage.

Recommendations:

- **High priority**: R15. Attracting international accelerators to the local ecosystem.

KPI 3. Performance of the educators in the seed stage

Indicator 3.1. The existence of mentorship associations.

According to the country-level assessment, the entrepreneurs meet industry mentors during entrepreneurial events and acceleration programmes. Apart from those, there is still no unified Belarusian mentorship association via which entrepreneurs can connect to local and international mentors.

Criteria: The existence of mentorship associations operating in the country:

- **Grade 0**: No mentorship associations are operating in the Belarusian ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no mentorship associations in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority**: R16. Creating mentorship associations.
- **Medium priority**: R17. Boosting mentorship associations by implementing access to service providers´ funding capacity.

Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

According to the country-level assessment, several educational programmes training entrepreneurial skills exist. A private school called IPM Business School provides high-quality business and managerial programmes in Russian and English with international professors.

Belhard IT Academy has a course called “IT Entrepreneurs: How to Launch Your Own Start-up” for entrepreneurs by the Institute of NLP in Minsk.

Apart from that, several companies, especially operating in the financial sector, support the creation of business incubators and accelerators, invest through those accelerators and provide facilities.

Criteria: The existence of the private sector´s entrepreneurial programmes operating in the country:

- **Grade 3**: Two private sector´s entrepreneurial programme is operating in the Belarusian ICT ecosystem.

Evaluation of the indicator:

- **Acceptable performance**: The private sector´s entrepreneurial programmes offer adequate access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R18. Empowering specialised incubation by focusing on digitalisation of the local industry.

Table 62. List of private sector’s entrepreneurial programmes in Belarus

#	Name of private sector’s entrepreneurial programme	Founding year
1	IPM Business School	1993
2	Belhard IT Academy	1999

KPI 4. Performance of the investors from the idea to the pre-seed stage

Indicator 4.1. The existence of crowdfunding platforms in the country.

According to the country-level assessment, at the moment, Belarus has three platforms where projects can officially crowdfund: TALAKA, MaeSens and Ulej.

The crowdfunding spin-off of Talaka is Talakosht. One of the essential conditions for projects here is their social importance. Currently, Talaka hosts over 250 active projects, primarily in the educational, cultural, and social spheres.

In contrast to Talakosht, Ulej is a for-profit organisation, collecting a 12% commission on successful projects. It operates according to the "all-or-nothing" model of the world-leading crowdfunding platform Kickstarter. Statistically, around 40 per cent of all projects at Ulej succeed in collecting the required funds. Ulej supports a wide range of initiatives, focusing on their originality and benefits to the public. The most popular projects at Ulej are charities, literature projects, and urban initiatives.

Criteria: The existence of crowdfunding platforms operating in the country:

- **Grade 3**: Three crowdfunding platforms are operating in the Belarusian ICT ecosystem.

Evaluation of the indicator:

- **Acceptable performance**: The crowdfunding platforms offer adequate access to capital to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R26. Creating crowdfunding platforms.
- **High priority:** R27. Empowering crowdfunding platforms through access to a critical mass of investors.

Table 63. List of crowdfunding platforms in Belarus

#	Name of crowdfunding platform
1	Talaka
2	Ulej
3	MaeSens

KPI 5. Performance of the investors from the seed to the early stage

Indicator 5.1. The quality of the local venture capital firms.

According to the country-level assessment and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, ten venture capital firms operate in Belarus in 2020 (*see the table below)*:

- TechMinsk Fund was founded in 2019 by a group of Belarusian tech-oriented businessmen who set up a $1.5 million fund to provide equity via the TechMinsk accelerator[33]. The ticket size may be up to $50,000.
- Bulba Ventures was founded in 2018 with a strong focus on digital high-tech. It offers start-ups amounts from €50,000 to €0,5 million. They have already made nine early-stage investments[34].
- Investment fund Palta focuses on artificial intelligence, virtual and augmented reality. The company is registered in Cyprus.

[33] The TechMinsk accelerator claims its alumni have raised more than $125 million in total since 2013.
[34] See more: https://www.crunchbase.com/organization/bulba-ventures/recent_investments.

- RBF Ventures is a $20 million start-up fund backed by the state-owned Belarusian Innovation Fund and the Russian state-owned fund of funds Russian Venture Company (RVC). RBF invests in Belarusian and Russian start-ups at different stages, from seed to Series B and beyond. Initiated in 2011, RBF Ventures became active in Belarus only in 2017.
- Launched in 2012, VP Capital invests in real estate and various tech companies. Among them are four in-house projects, which received $80 million capital injections over the past three years, according to the fund's information.
- Zubr Capital was founded in 2010 (with backing from EBRD and Dutch Development Fund FMO) as the first professional direct investment fund manager in the country. This private equity fund invests in such different sectors as telecommunications, IT, retail, durable goods, and innovative technologies. Zubr Capital offers start-ups from $3 million to $7 million, generally taking 25% of its total equity.

Other venture capital firms in Belarus are Larnabel Ventures, Belarus-China Joint Venture Fund, Flint Capital, EBRD Venture Capital Investment Programme and Hackspace Capital.

For the years 2017-2019, the locally presented VCs have invested in seed and early stages more than $10 million[35].

Criteria: The number of venture capital firms per million inhabitants:

- **Grade 2**: The number of venture capital firms per million inhabitants in Belarus is 1.05 from a total number of ten venture capital firms; 0.68 less compared to 1.73 accelerators per million inhabitants in the selected East-Central European countries.

Criteria: The average number of investments per local venture capital firms from 2017 to 2020:

- **Grade 2**: The average number of investments per local VC firms in Belarus from 2017 to 2020 is 3.6 from a total 36 investments; 2.47 less compared to the average of 6.07 number of investments in the selected East-Central European countries.

Criteria: The average operating period of the country's active venture capital firms:

- **Grade 4**: The Belarusian venture capital firms´ average operating period is six years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The venture capital firms offer adequate access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R20. Creating venture capital firms.
- **High priority:** R19. Empowering venture capital firms through fund of funds programmes.
- **Medium priority:** R21. Boosting ventures capital firms through access to international markets.

Table 64. List of local venture capital firms in Belarus

#	Name of local venture capital firm	Founding year	Number of investments since 2017
1	TechMinsk Fund	2019	3
2	Bulba Ventures	2018	9
3	Palta	2016	1
4	RBF Ventures	2011	4

[35] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".

#	Name of local venture capital firm	Founding year	Number of investments since 2017
5	VP Capital	2012	2
6	Zubr Capital	2010	5
7	Larnabel Ventures	2014	4
8	Belarus-China Joint Venture Fund	2019	2
9	Flint Capital	2013	4
10	EBRD Venture Capital Investment Programme	2019	2

Indicator 5.2. The existence of international venture capital firms operating in the country.

According to the country-level assessment, and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, five foreign-origin funds are present in Belarus with a focus on the tech industry and innovation in traditional sectors: Larnabel Ventures, Belarus-China Joint Venture Fund, Flint Capital, EBRD Venture Capital Investment Programme and Palta Ventures (*see also table above)*. Those funds' presence creates opportunities for the local start-ups to have access to significant investments. Most of them are related to Russian investors.

Criteria: The existence of international venture capital firms operating in the country:

- **Grade 3**: Five international venture capital firms are operating in the Belarusian ICT ecosystem.

Evaluation of the indicator:

- **Optimal performance**: The international venture capital firms offer optimal access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R22. Attracting international venture capital firms to the local ecosystem.

Indicator 5.3. The quality of business angels networks.

According to the country-level assessment, and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, business angels activity is emerging in Belarus. AngelsBand, an association registered in 2018, claims 90 members. These individuals generally invest in digital high-tech start-ups at the pre-seed and seed stages.

For the years 2017-2019, the local business angels have invested in Belarusian start-ups around €2,14 million.

Criteria: The number of business angels networks per million inhabitants:

- **Grade 3:** 1 business angels network is operating in the Belarusian ICT ecosystem.

Criteria: The average number of investments per local business angels network from 2017 to 2020:

- **Grade 1**: The average number of investments per local business angels network in Belarus from 2017 to 2020 is 2.33 from a total seven investments; 15.87 less compared to the average of 18.20 number of investments in the selected East-Central European countries.

Criteria: The average operating period of the country's active business angels networks:

- **Grade 2**: The Belarusian business angels networks´ average operating period is three years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The business angel networks offer limited access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R23. Creating business angels networks.
- **Medium priority:** R24. Empowering business angels networks by strengthening the investment expertise.
- **Low priority:** R25. Boosting business angels networks through co-investment matching programmes.

Table 65. List of business angels networks in Belarus

#	Name of business angels network	Founding year	Number of investments since 2017
1	AngelsBand	2018	7

KPI 6. Performance of the connectors in talent generation

Indicator 6.1. The existence of talent generation events[36].

According to the country-level assessment, the Belarusian entrepreneurial ecosystem hosts dozens of talent attraction events for about ten years such as hackathons, business luncheons, and workshops. Mostly, the organisers are IT and software development companies and accelerators. The recurring events raising awareness about entrepreneurship are the Global Entrepreneurship Week Belarus, meet-ups by EventSpace, Imaguru, GoWay and Minsk Ruby, PyCon Belarus, Women TechMakers Minsk, GDG Minsk, Cocoa Heads Belarus, and several other events for mostly the IT professionals (*see table below*).

Criteria: The existence of relevant talent generation events in the country:

- **Grade 3**: Nine relevant talent generation event are operating in the Belarusian ICT ecosystem.

Criteria: The average operating period of the country's active talent generation events:

- **Grade 4**: The Belarusian talent generation events´ average operating period is six years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The talent generation events offer optimal access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R28. Creating talent generation events.
- **Medium priority:** R29. Empowering talent generation events through sponsorship.

[36] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Table 66. List of talent generation events in Belarus

#	Name of talent generation event	Founding year
1	GEW Belarus	2010
2	PyCon Belarus	2015
3	EventSpace meet-ups	2014
4	Minsk Ruby meet-ups	2016
5	Women TechMakers Minsk	2015
6	GoWay Meet-up	2017
7	GDG Minsk	2014
8	CocoaHeads Belarus	2013
9	Imaguru meet-ups	2013

KPI 7. Performance of the connectors from the idea to the pre-seed stage

Indicator 7.1. The quality of the entrepreneurial events[37].

According to the country-level assessment, many start-up events occur in Belarus. Among the most significant regular start-up events in Belarus are the Venture Day Minsk conference (held at the Imaguru Business Club), the EMERGE technology conference, SAP forum, IT BDSMINSK, IT Spring, Grocon, and events held under the auspices of Start-up Weekend Belarus (*see the table below)*. During the latter, the private sector representatives gather to meet the entrepreneurs, learn about existing opportunities, and share contacts.

Criteria: The number of entrepreneurial events per million inhabitants:

- **Grade 1**: The number of entrepreneurial events per million inhabitants in Belarus is 0.74 from a total number of seven recurrent events; 0.78 less compared to 1.52 entrepreneurial events per million inhabitants in the selected East-Central European countries.

Criteria: The average estimated number of attendees per entrepreneurial event:

- **Grade 1**: The average number of attendees per entrepreneurial event in Belarus is 850; 1,350 less compared to 2,200 average number of attendees per entrepreneurial event in the selected East-Central European countries.

Criteria: The average operating period of the country's active entrepreneurial events:

- **Grade 4**: The Belarusian entrepreneurial events´ average operating period is 6.7 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The entrepreneurial events offer adequate access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R30. Creating entrepreneurial events.
- **High priority:** R31. Empowering entrepreneurial events through sponsorship.

[37] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

- **Medium priority:** R32. Boosting entrepreneurial events through internationalisation.

Table 67. List of entrepreneurial events in Belarus

#	Name of entrepreneurial event	Founding year	Number of participants in 2019
1	Start-up Weekend Belarus	2009	500
2	Venture Day Minsk Conference	2015	1500
3	EMERGE technology conference	2018	2100
4	SAP forum	2012	600
5	IT BDSMINSK	2018	500
6	IT Spring	2012	350
7	Grocon	2016	400

Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem.

According to the country-level assessment, there are a few online channels in Belarus regarding media coverage on IT news and opportunities (*see table below*):

- Start-uplife.by is the only online media in Belarus focused on start-ups. Currently, it covers Belarus start-up development, start-up events, and trends in Russian.
- 42.tut.by is the IT news section of the largest Belarus online portal TUT.by.
- Online portal Probusiness covers different events and news around business and entrepreneurship in Belarus, including start-ups and tech companies.
- Start-up Jedi is an online mass media dedicated to the venture market; they post educational materials, interviews with start-up founders, investors and reviews of start-up ecosystems.

There are no local databases in the country, which provide aggregated information of the local ecosystem players and activities.

Criteria: The existence of specialised entrepreneurial media in the country:

- **Grade 3:** Four specialised entrepreneurial media are operating in the Belarusian ICT ecosystem.

Criteria: The existence of relevant ICT entrepreneurial ecosystem databases:

- **Grade 0**: No ICT entrepreneurial ecosystem´s database is operating in the Belarusian ICT ecosystem.

Criteria: The average operating period of the country's active specialised entrepreneurial media and databases:

- **Grade 1**: The Belarusian specialised entrepreneurial media and ecosystem´s databases average operating period is 6.5 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R33. Creating ICT ecosystem databases.

Table 68. List of specialised entrepreneurial media in Belarus

#	Name of specialised entrepreneurial media	Founding year
1	Probusiness	2014
2	TUT	2020
3	Start-uplife	2005
4	Start-up Jedi	2019

KPI 8. Performance of the connectors from the seed to the early stage

Indicator 8.1. The existence of investment forums[38].

According to the country-level assessment, the Belarusian government is active in organising investment forums to present investment opportunities and discuss worldwide economic trends (*see table below*). The investment forums go back to 2010.

The Belarusian Investment Forum 2017 was organised by the National Agency of Investment and Privatization, Ministry of Economy of the Republic of Belarus. Belarus's main economic trends and investment opportunities were discussed during the forum.

The Embassy of Belarus in China, the National Agency of investment and privatisation of Belarus, with the Ministry of communications and information, the Ministry of Industry, and the Ministry of Economy of Belarus organised the Belarus-Asia Investment forum for discussing mutual investment opportunities.

The "Mill of Success" international investment forum was held for the 12th time in Belarus in 2020. The forum is attracting an auditorium composed of dozens of countries' representatives. The investors, legal advisors, ambassadors and other stakeholders discuss the investment trends and opportunities.

In 2020, the Belarusian Industrial and Investment Forum was held first time[39]. It aims to assist the enterprises and organisations in solving problems of expanding the release of high-tech competitive products, introducing new high-tech technologies and equipment, development of international cooperation, and attracting investment.

Criteria: The existence of investment forums in the country:

- **Grade 3:** Three investment forum is operating in the Belarusian ICT ecosystem.

Criteria: The average operating period of the country's active investment forums:

- **Grade 4**: The Belarusian investment forums´ average operating period is 4.8 year as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The investment forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R34. Creating investment forums.
- **Medium priority:** R35. Empowering investment forums through sponsorship.
- **High priority:** R36. Boosting investment forums through internationalisation.

[38] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.
[39] The forum is only mentioned as worth attention but is not included in the scope of the assessment as it was established only in 2020.

Table 69. List of investment forums in Belarus

#	Name of investment forum	Founding year
1	Belarusian Investment Forum	2017
2	Belarus-Asia Investment Forum	2019
3	"Mill of Success" international investment forum	2003

Indicator 8.2. The existence of national trade fairs and business forums[40].

According to the country-level assessment, dozens of exhibitions are held each year in Belarus, covering nearly all the fields from science to leisure and tourism[41]. The experts highlight the top relevant trade fairs that are Devgamm Minsk for the gaming industry, Belarus Medica, Energy Expo, Belagro for agricultural products, international exhibitions on food industry and transportation, Prodexpo and BelTex Industry is one of the largest and oldest expos in Belarus (*see the table below)*.

The government is also organising business forums with different countries for discussing mutual business opportunities. Examples are Belarus-Montenegro and Belarus-Pakistan business forums.

Criteria: The existence of national trade fairs and business forums in the country:

- **Grade 3:** Nine national trade fairs and business forums are operating in the Belarusian ICT ecosystem.

Criteria: The average operating period of the country's active national trade fairs and business forums:

- **Grade 4**: The Belarusian national trade fairs and business forums´ average operating period is 13 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The national trade fairs and business forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Medium priority:** R37. Empowering business forums by connecting private sector with ICT ecosystem.
- **High priority:** R38. Boosting the promising start-ups through access to international trade fairs.

[40] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.
[41] Exhibitions in Belarus: https://10times.com/top100/belarus.

Table 70. List of trade fairs and business forums in Belarus

#	Name of trade fair or business forum	Founding year
1	Prodexpo	1994
2	Devgamm Minsk	2017
3	Belarus Medica	1996
4	International Fair for Tourism	2018
5	Belagro	2019
6	Energy Expo	1996
7	International Food and Beverage Exhibition	2019
8	International Exhibition on Transport and Logistics	2018
9	BelTexIndustry	1974

KPI 9. Performance of the facilitators in the idea stage

Indicator 9.1. The quality of tech facilities to support the start-up creation.

According to the country-level assessment, there are 12 tech facilities in Belarus, mostly tech parks supporting tech start-ups (*see table below*).

China-Belarus Industrial Park “Great Stone” is a relatively new player in the market among other tech parks with high-tech priorities. Among its stated preferences are the implementation of research, development and experimental research in big data, telecommunications and biotechnology.

One of the most popular entrepreneurial spaces in Belarus is a Start-up Hub Imaguru. It offers co-working space to innovative entrepreneurs, holds educational events and meet-ups, provides access to a large community of venture market representatives of the country, and organises large field-specified conferences (e.g. GEW Belarus, Venture Day Minsk). It also offers Imaguru Start-up Lab Online to access educational material, networking and meeting mentors.

EventSpace is a noteworthy IT co-working and event space. This independent platform efficiently gathers leading technology and professional communities in Belarus. The team annually holds more than 10 international conferences on digital technologies, programming languages and IT management. Every year the platform holds more than 100 meet-ups organised by communities of independent developers, managers and other specialists in the IT industry.

Criteria: The number of tech facilities per million inhabitants:

- **Grade 3**: The number of tech facilities per million inhabitants in Belarus is 1.3 from a total number of 12 tech facilities; 0.02 less compared to 1.32 tech facilities per million inhabitants in the selected East-Central European countries.

Criteria: The average number of annually founded spin-offs per tech facilities:

- **Grade 0**: The average number of yearly founded spin-offs per tech facilities in Belarus from 2017 to 2020 is 0. There is 2.03 yearly founded spin-offs per tech facilities in the selected East-Central European countries from 2017 to 2020.

Criteria: The average operating period of the country’s active tech facilities:

- **Grade 4**: The Belarusian tech facilities´ average operating period is 8.2 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R39. Creating tech parks.
- **Medium priority:** R40. Empowering tech facilities through technology clustering.

Table 71. List of tech facilities in Belarus

#	Name of tech facility	Spin-offs/year	Founding year	Free working space	Laboratories	Access to interns
1	Great Stone	0	2012	Yes	Yes	Yes
2	Start-up Hub Imaguru	0	2013	Yes	Yes	Yes
3	EventSpace	0	2014	Yes	No	Yes
4	Business Incubator of the High-Tech Park	0	2015	Yes	No	Yes
5	BSU Start-up School	0	2019	Yes	Yes	Yes
6	Science Tech Park "Polytechnic" at the Belarusian National Technical University	0	2010	Yes	Yes	Yes
7	Tech Park at the Yanka Kupala Grodno State University	0	2017	Yes	Yes	Yes
8	Minsk City Technopark	0	2011	Yes	Yes	Yes
9	Brest Science Tech Park	0	2013	Yes	Yes	Yes
10	Gomel Tech Park	0	2016	Yes	Yes	Yes
11	Tech Park Mogilev	0	1998	Yes	Yes	Yes
12	Co-working centre of the High-Tech Park filial in Grodno	0	2016	Yes	Yes	Yes

Indicator 9.2. The existence of the tech facilities to support the start-up creation in small urban and rural areas.

According to the country level assessment, there are 5 tech facilities in Belarus's small urban and rural areas that are Tech Park at the Yanka Kupala Grodno State University, Brest Science Tech Park, Gomel Tech Park, Tech Park Mogilev, and the Co-working centre of the High-Tech Park filial in Grodno (*see also table above*).

Criteria: The existence of tech facilities operating in the country's small urban and rural areas:

- **Grade 3**: Five tech facilities in small urban and rural areas are operating in the Belarusian ICT ecosystem.

Evaluation of the indicator:

- **Acceptable performance**: The tech facilities in small urban and rural areas offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Medium priority:** R42. Creating tech parks in small urban areas.

KPI 10. Performance of the facilitators from the pre-seed to the early stage

Indicator 10.1. The existence of the business facilities to support the start-up development.

According to the country level assessment, 18 business facilities are compliant with Belarus's start-up needs. Several of those are tech parks that host both traditional businesses and tech companies: Minsk City Technopark, Great Stone, Brest Science-Tech Park, Gomel Tech Park, Tech Park Mogilev (*see table below*).

In April 2019, a free Alfa-Business Hub opened in Minsk, powered by Alfa Bank. The hub is divided into several zones: individual work zone, conference rooms, classroom, conventional hall, relax-zone.

Belagroprombanka has also created a co-working space for start-ups. The hub is divided into several zones: zones for individual work, conference rooms, a classroom, a conventional hall and a relax-zone.

Minsk City Technopark is a government technology park that provides low-cost incubator space for start-ups and support for high-tech businesses.

Criteria: The existence of business facilities in the country:

- **Grade 3:** 18 Business facilities are operating in the Belarusian ICT ecosystem.

Criteria: The average operating period of the country's active business facilities:

- **Grade 4**: The Belarusian business facilities´ average operating period is seven years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The business facilities offer optimal access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R41. Boosting the promising start-ups through access to business centres.

Table 72. List of co-working spaces and business centres in Belarus

#	Name of co-working space or business centre	Founding year
1	Alfa Business Hub	2019
2	Belagroprombanka	2019
3	Regus Business Centre at Minsk	2020
4	BSUIR Business Incubator	2010
5	Bereza Business Incubator (Brest Region)	2018
6	"Law and order" Polotsk Business Incubator (Vitebsk Region)	2017
7	"Law and order" Orsha Business Incubator (Vitebsk Region)	2020
8	"DreamProject" Business Incubator in Slonim (Grodno Region)	2017
9	"Innovatika" Business Incubator in Volkovysk (Grodno Region)	2020
10	"Apsel" Business Incubator in Lida (Grodno Region)	2011
11	ZAO "Map" Business Incubator in Kolodishchi (Minsk Region)	1998
12	"Librum" Business Incubator in Dzerzhinsk (Minsk Region)	2011
13	Borisov Regional Technopark (Minsk Region)	2018
14	"UIN" Business Incubator in Rudensk (Minsk Region)	2018
15	"Komarova" Business Incubator in Komarova village (Miadel District, Minsk Region)	2019
16	Business Incubator in Bikhov (Mogilev region)	2020
17	Baranovichi Business Incubator (Brest Region)	2017
18	"RadugaSvet" Business Incubator in Soligorsk (Minsk Region)	2011

Involvement of the public sector in the development of the ecosystem

The level of involvement of the public entities such as government, development agencies and international organisations is key to the ecosystem's growth. Although these entities are not evaluated in this analysis, the authors summarise their involvement in the ICT entrepreneurial ecosystem's development in the sections below.

International organisations

According to the country-level assessment, international organisations are offering start-ups access to knowledge, capital and market:

1) The most notable international organisations involvement in offering access to knowledge in the idea and pre-seed stages is delivered by the USAID funded Innovation-Based Economic Development and Private Sector Growth in Belarus (INNOVATE) Activity and the EU/United Nations Development Programme (UNDP) funded "Support to Economic Development at the Local Level in the Republic of Belarus" Project.

   In addition to the above-mentioned activity, USAID is active in supporting Belarusian IT ecosystem, promoting many education programmes, facilities, and funding[42]. Projects include business training, international experience exchange, and funding opportunities for start-ups. This five-year $10 million programme INNOVATE launched in 2020, aims to develop the ecosystem for innovation-based entrepreneurship in Belarus and expand the private sector's role in an innovative economy. According to the second objective of the programme (to strengthen innovative business support institutions and help

[42] More on private sector development: https://www.usaid.gov/belarus/private-sector-development-and-entrepreneurship.

build competencies for the new economy) local innovative business support initiatives will be selected and funded; initiatives such help local stakeholders create or further develop accelerators, incubators, start-up and business schools, innovation labs, design centres, R&D centres, industry or corporate universities, and training centres. This kind of initiatives will also have international partnership components.

The distance learning programme "Start-up School" is developed within the "Support to Economic Development at the Local Level in the Republic of Belarus" project. The project is funded by the European Union and implemented by the UNDP in partnership with the Ministry of Economy of the Republic of Belarus. The distance programme consists of video courses, guidance and individual consultations. The video courses and the guidance cover the most relevant topics for managing a business: planning, legal framework and taxation[43].

2) The most notable international organisations involvement in offering access to knowledge in the idea and pre-seed stages is delivered by the USAID funded INNOVATE activity and the USAID funded Facilitating Access to Venture Funding in Belarus (AID-VENTURE) activity.

   Based on the third objective of the INNOVATE activity (to enhance financing for innovative businesses), it aims to help to expand funding for innovative businesses and further grow the local community of venture investors, establish venture funds. In line with global practices, INNOVATE activity aims to develop innovative financing tools such as crowdfunding and crowd investing, corporate grant making programmes for research projects and prospective innovative start-ups, as well as scholarships and prize competitions. Another important objective of the activity is to help traditional financial institutions and actors develop new debt financing products adapted to needs of innovative early-stage businesses as well as to encourage public-private mechanisms for financing innovations.

   In 2016, USAID launched the AID-VENTURE activity, implemented by the Belbiz Group of Companies. In 2018, the first Belarus Business Angels Network was launched under this activity. AID-VENTURE has also helped to establish the first acceleration fund TechMinsk Ventures.

3) The most notable international organisations involvement in offering access to market to the start-ups is delivered by the USAID funded INNOVATE activity.

   As part of INNOVATE, USAID aims to deepen collaboration with the private sector by engaging local and international private companies in the activity implementation. Thus, INNOVATE is specifically intended to support local and international private sector engagement and private sector projects in developing the innovation-based entrepreneurship ecosystem, where the local and international private sector contributes financial and in-kind resources. The private sector can bring advanced expertise, networks, resources, and ultimately investments to the country. Such initiatives could later be managed solely by the private sector, which would ensure their sustainability.

   Since 2011, USAID continues to partner with Belbiz to organise Global Entrepreneurship Week (GEW). This annual worldwide event takes place in 160 countries. Each year the Belarus GEW attracts participants from the private sector, the international community, civil society, and government to discuss key issues of business development. GEW roundtables, master classes, and competitions provide state-of-the-art knowledge, skills, and connections to hundreds of entrepreneurs[44].

Government involvement as an ecosystem builder

According to the "Strategy for Development of the Digital Economy and Information Society for 2016 – 2020", the information society's development is one of priorities of the Republic of Belarus[45].

[43] More about the Start-up School: https://www.by.undp.org/content/belarus/en/home/presscenter/pressreleases/2020/the-eu-and-undp-in-partnership-with-the-ministry-of-economy-of-b.html.
[44] More about GEW: https://www.usaid.gov/belarus/fact-sheets/private-sector-development#:~:text=Launched%20in%202016%2C%20AID%2DVENTURE,the%20international%20venture%20funding%20ecosystem.
[45] "Strategy for Development of the Digital Economy and Information Society for 2016 – 2020", see: http://www.government.by/upload/docs/file4c1542d87d1083b5.PDF.

High Tech Park was created by the government in 2006 as an innovative IT cluster to support the software industry's development. Regarding framework conditions, the key attraction of the park is the preferential tax regime on offer to its residents.

InfoPark was created in 2001 as a union of software developing companies in the Republic of Belarus. Association is open for cooperation for implementing promising ideas and projects aimed at developing the domestic information technology development industry, creating favourable conditions for activities of the IT companies and expanding contacts and cooperation ties of its members with interested partners in Belarus and abroad.

In 2019, the state budget spent on scientific, technical and innovative activities is amounted to €118 million. Following the law on the Republican budget for 2020, the budget spent on scientific, technical, and innovative activities is about €140 million, the republican centralised innovation fund is about €76 million, and local innovation funds - about €106 million.

Government involvement as a regulator

According to the country-level assessment, investment activities in Belarus are regulated by the Law On investments[46], civil and other legislation, international treaties, and investment agreements. The Republic of Belarus has signed over 60 bilateral agreements on the encouragement and mutual protection of investments and over 60 bilateral agreements on double taxation avoidance.

Several special regimes of taxation and investments in Belarus are available for residents of special zones or performing eligible activities. Conditions for IT companies became more attractive after adopting the President`s Decree No. 8 "On Development of Digital Economy."

The most applicable regulation to start-ups and digital innovation companies in the High-Technology Park is one providing an exemption from several taxes (tax on the income of foreign organisations that do not operate in the Republic of Belarus through a permanent representative office, VAT on sales of goods, VAT on import , real estate tax in respect of objects located on the territory of the park, offshore fee for payments for advertising, marketing, intermediary services, as well as for payment of dividends to the founders of the Park's resident, import customs payments and VAT when importing goods for the implementation of activities in the IT-industry) and partial exemption from taxes (reduced income tax ratio for employees). A ratio of 5% is set on the income of foreign organisations that do not operate in the Republic of Belarus through a permanent representative office. In addition to that, special favourable tax, customs and business regimes are provided by the following:

1. Chinese-Belarusian Industrial Park "Great stone".
2. Free economic zones[47].
3. Investment agreements with preferences[48].
4. Special regime for small and medium-sized towns[49], and rural areas[50].

In 2017, the investment activities were liberalised by a government decree, making Belarus the first government in the world opening legal opportunities for blockchain and cryptocurrency[51].

The current level of harmonisation of IPR protection rules in Belarus is high. However, treaties are not yet ratified related to digital innovations. To obtain legal trademark protection, a business entity shall register a trademark in each of these states or use international registration system of the World Intellectual Property Organisation (WIPO).

[46] The Law of the Republic of Belarus dd. July 12, 2013 N 53-З О Investments: https://www.economy.gov.by/en/new_url_427482252-en/.
[47] Free Economic Zones (FEZ): https://www.economy.gov.by/en/cez-en/.
[48] Investment contract with the Republic of Belarus: https://www.economy.gov.by/en/invest-dogovor-en/.
[49] Special regime for small towns: https://www.economy.gov.by/en/litl-town-en/.
[50] Special regime rural communities: https://www.economy.gov.by/en/selo-en/.
[51] About private sector development and entrepreneurship: https://www.ewdn.com/2017/12/25/belarus-liberalizes-high-tech-activities-how-foreign-investors-and-neighboring-countries-could-be-affected/.

6.3. Recommendations by priority in Belarus

Below the experts list the **high and medium priority** recommendations necessary to empower the ICT entrepreneurial ecosystem of Belarus.

Also, the detailed list of all main recommendations for capacity builders acting in the six Eastern Partnership countries can be found in Chapter 11.

Table 73. Priority recommendations for empowering the Belarusian ICT entrepreneurial ecosystem

Recommendation	Priority	Area	Stage
R1. Creating universities´ entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R2. Empowering universities by implementing specialised entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R5. Empowering technology education centres by implementing educational specialisation in emerging technologies	MEDIUM	KNOWLEDGE	IDEA
R6. Boosting technology education centres by implementing educational specialisation in emerging technologies	HIGH	KNOWLEDGE	IDEA
R7. Boosting technology education centres by funding capacity for R&D development	HIGH	KNOWLEDGE	IDEA
R8. Creating incubators	HIGH	KNOWLEDGE	PRE-SEED
R9. Empowering incubators by implementing specialised incubation programmes	MEDIUM	KNOWLEDGE	PRE-SEED
R12. Empowering accelerators by implementing specialised pre-acceleration programmes	HIGH	KNOWLEDGE	SEED
R13. Boosting accelerators by implementing seed-stage grant schemes	MEDIUM	KNOWLEDGE	SEED
R14. Boosting accelerators through access to local and international markets	MEDIUM	KNOWLEDGE	SEED
R15. Attracting international accelerators to the local ecosystem	HIGH	KNOWLEDGE	SEED
R16. Creating mentorship associations	HIGH	KNOWLEDGE	EARLY
R17. Boosting mentorship associations by implementing access to service providers´ funding capacity	MEDIUM	KNOWLEDGE	EARLY
R18. Empowering specialised incubation by focusing on digitalisation of the local industry	HIGH	KNOWLEDGE	EARLY
R19. Empowering venture capital firms through fund of funds programmes	HIGH	CAPITAL	EARLY

Recommendation	Priority	Area	Stage
R21. Boosting ventures capital firms through access to international markets	MEDIUM	CAPITAL	EARLY
R23. Creating business angels networks	HIGH	CAPITAL	SEED
R24. Empowering business angels networks by strengthening the investment expertise	MEDIUM	CAPITAL	SEED
R27. Empowering crowdfunding platforms through access to a critical mass of investors	HIGH	CAPITAL	PRE-SEED
R28. Creating talent generation events	HIGH	MARKET	IDEA
R29. Empowering talent generation events through sponsorship	MEDIUM	MARKET	IDEA
R31. Empowering entrepreneurial events through sponsorship	HIGH	MARKET	PRE-SEED
R32. Boosting entrepreneurial events through internationalisation	MEDIUM	MARKET	PRE-SEED
R33. Creating ICT ecosystem databases	HIGH	MARKET	SEED
R35. Empowering investment forums through sponsorship	MEDIUM	MARKET	SEED
R36. Boosting investment forums through internationalisation	HIGH	MARKET	SEED
R37. Empowering business forums by connecting private sector with ICT ecosystem	MEDIUM	MARKET	EARLY
R38. Boosting the promising start-ups through access to international trade fairs	HIGH	MARKET	EARLY
R40. Empowering tech facilities through technology clustering	MEDIUM	RESOURCES	IDEA
R41. Boosting the promising start-ups through access to business centres	HIGH	RESOURCES	EARLY
R42. Creating tech parks in small urban areas	MEDIUM	RESOURCES	IDEA

Chapter 7: GEORGIA

This diagnosis of the performance of the ICT entrepreneurial ecosystem stakeholders in Georgia is structured in the following manner:

1. Current status of ICT entrepreneurial ecosystem performance through comparison of the conversion ratios of ICT start-ups in different growth stages with select European and other countries.
2. Diagnosis of the performance of the different ecosystem stakeholders: educators, investors, connectors and facilitators by evaluating 19 indicators *(see Chapter 3).*
3. Prioritisation of the main recommendations for further developing the ICT entrepreneurial ecosystem in Georgia.

The detailed methodology of the diagnosis is provided in Chapter 1.

7.1. Status of the ICT Entrepreneurial Ecosystem in Georgia

This subchapter provides information on:

1. Start-ups strength, by providing the comparison of the start-ups conversion ratios from the idea stage to the early stage with select European and other more mature ecosystems.
2. Ecosystems stakeholders status in the different stages of the start-ups' lifecycle.

To analyse the maturity of the ICT entrepreneurial ecosystem in Georgia, first, the strength of the start-ups according to the conversion ratios from the idea stage to the early stage was compared with the ratios of the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania). These countries have been selected due to similarities with the Eastern partner countries such as ICT ecosystem size, targeted IT industries and their size, historical and cultural development path. In addition, the experts have compared the conversion ratios of the Georgian start-ups with well-developed ecosystems of four selected Western European countries (Germany, France, United Kingdom and Spain), as well as with more mature ecosystems like California (Silicon Valley) and Israel *(see tables below).*

The conversion ratios have been calculated based on the information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries" and the largest ICT entrepreneurial databases Dealroom and CrunchBase. The latter sources provide information on a large number of start-ups and investment rounds to calculate the conversion ratios that are close to reality. However, the reader should bear in mind that the mentioned sources do not provide comprehensive data on all start-ups operating in the compared countries, especially in the idea and pre-seed stages, where start-ups have not yet received investments. Also, these sources do not collect the information on start-ups in the early to scale-up stage that have grown without the need for external investments. Nevertheless, these estimated ratios include a significant sample of companies, allowing to make an assumption about the actual conversion ratios of the start-ups in the country.

The experts have compared the conversion ratios of the Georgian start-ups and other selected countries and the differences are provided in the tables below.

Table 74. Conversion ratios compared with the selected East-Central European countries

#	Country	Ratio idea to pre-Seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**EAST-CENTRALEUROPE AVERAGE**	**0,06%**	**12,54%**	**4,24%**	**0,64%**	**0,19%**
1.1	**LITHUANIA**	0,11%	14,23%	4,84%	0,79%	0,30%
1.2	**ESTONIA**	0,06%	12,49%	4,96%	0,53%	0,14%
1.3	**POLAND**	0,04%	11,91%	3,21%	1,25%	0,27%
1.4	**BULGARIA**	0,05%	12,26%	4,56%	0,28%	0,11%
1.5	**ROMANIA**	0,04%	11,79%	3,64%	0,36%	0,14%
2	**GEORGIA**	**0,04%**	**4,18%**	**0,92%**	**0,12%**	**0%**
2-1	**DIFFERENCE**	**-26,35%**	**-66,66%**	**-78,26%**	**-80,76%**	**-100%**

Table 75. Conversion ratios compared with the selected Western European countries

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**WESTERN EUROPE AVERAGE**	**0,11%**	**15,94%**	**4,66%**	**1,47%**	**0,59%**
1.1	**GERMANY**	0,06%	16,60%	5,13%	2,09%	0,79%
1.2	**FRANCE**	0,06%	15,92%	4,87%	1,93%	0,67%
1.3	**UNITED KINGDOM**	0,21%	16,23%	5,32%	1,27%	0,63%
1.4	**SPAIN**	0,10%	15,01%	3,31%	0,58%	0,27%
2	**GEORGIA**	**0,04%**	**4,18%**	**0,92%**	**0,12%**	**0%**
2-1	**DIFFERENCE**	**-60,16%**	**-73,78%**	**-80,20%**	**-91,64%**	**-100%**

Table 76. Conversion ratios compared with California and Israel

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**CALIFORNIA**	0,73%	22,23%	4,89%	2,43%	0,68%
2	**ISRAEL**	0,26%	23,21%	6,11%	3,66%	0,72%
3	**GEORGIA**	**0,04%**	**4,18%**	**0,92%**	**0,12%**	**0%**
3-(1+2)	**DIFFERENCE**	**-95,56%**	**-90,80%**	**-91,62%**	**-97,98%**	**-100%**

As illustrated in the tables above, the Georgian start-ups' conversion rates are significantly lower in almost all stages than the ecosystems in selected East-Central and Western European countries and Silicon Valley.

The start-ups conversion ratio from seed stage to early stage is significantly lower in comparison with the selected East-Central European countries, due to the difficulties that the start-ups are facing when seeking to validate their business models locally. Also, the conversion ratio from early stage to scale-up is significantly lower due to the difficulties for start-ups to grow internationally.

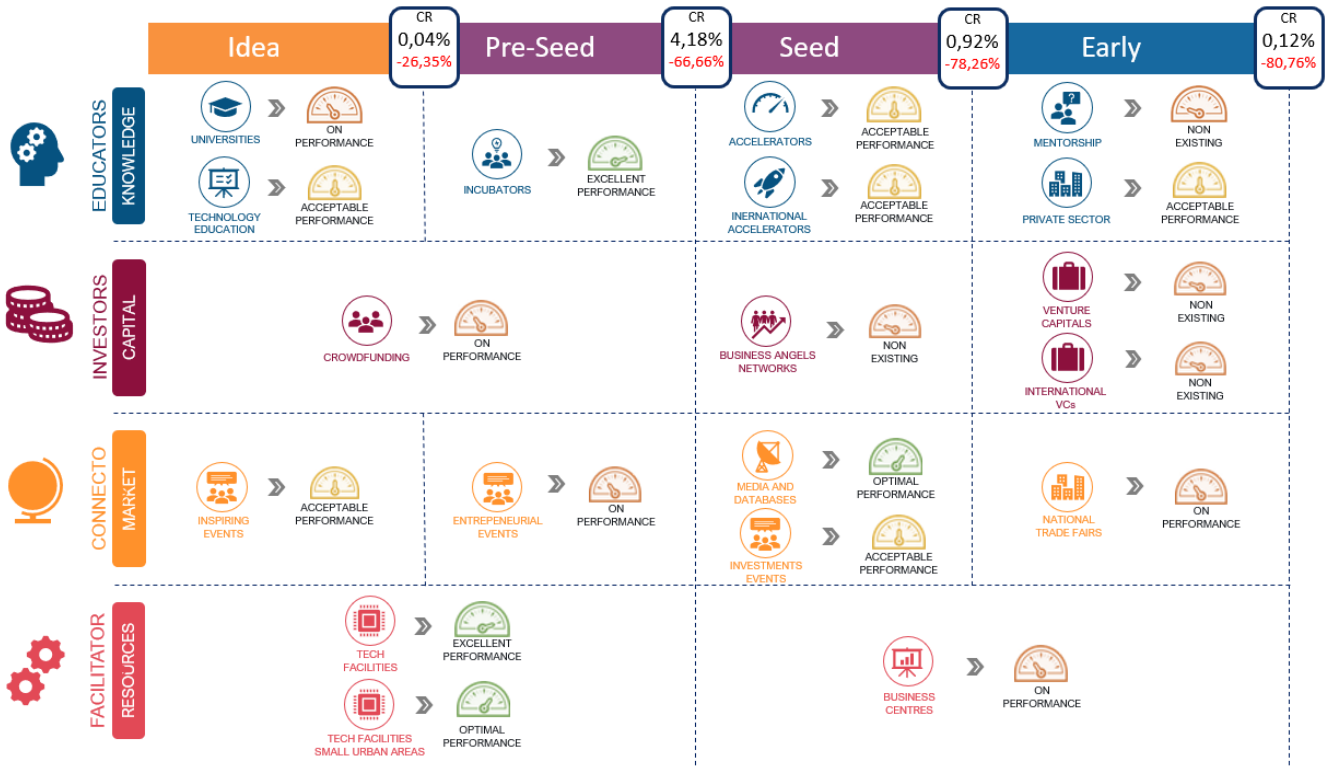
The conversion ratios are impacted by the ecosystem stakeholders involvement in start-ups' development and growth. The diagnosis below analyses the performance of those stakeholders that support start-ups' growth from the idea stage to the early stage. Once the start-up becomes a company with international perspectives or scale-up, the local entrepreneurial ecosystem stakeholders' relevance is reduced, and start-up growth is ensured by its own resources.

The figure below presents the level of stakeholders' performance at each stage of the start-ups' growth. It was developed to offer the reader a clear view of the main strengths and weaknesses of the ICT entrepreneurial ecosystem in Georgia. The figure provides information on:

1. The conversion ratios (CR) of Georgia ecosystem start-ups from idea to early stage.
2. The difference in the Georgian start-ups' conversion ratios compared with the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania) from idea to early stage.
3. The ecosystem status by stakeholder type (from educators to facilitators) and start-up growth stage (from the idea stage to the early stage).

The majority of the stakeholders are involved in several stages of the start-up lifecycle, but in the figure, they are assigned only to the stages their involvement is the most active.

Figure 15. Georgian ICT entrepreneurial ecosystem performance status (CR – conversion ratio)



The performance of the stakeholders at each stage of the start-ups growth are evaluated below.

Idea stage: 0.04% Conversion ratio from the idea stage to pre-seed stage

The conversion ratio of the Georgian individuals having a business idea to entrepreneurs creating a start-up in a pre-seed stage is 0.04%; the ratio is 26.35% smaller compared to the 0.06% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the idea stage is provided in the table below.

Table 77. Stakeholders´ performance in the idea stage

#	Indicator	Performance	Explanation
1.	Indicator 1.1. The quality of universities´ entrepreneurial education programmes	*On performance*	The universities entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 1.2. The quality of technology education centres giving access to emerging technologies specialisation	*Acceptable performance*	The technology education entities offer adequate access to emerging technologies specialisation to talented individuals in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 6.1. The existence of talent generation events	*Acceptable performance*	The talent generation events offer adequate access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 9.1. The quality of the tech facilities to support the start-up creation	*Excellent performance*	The tech facilities offer excellent access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 9.2. The existence of the tech facilities to support the start-up creation in small urban and rural areas	*Optimal performance*	The tech facilities in small urban and rural areas offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Pre-seed stage: 4.18% Conversion ratio from the pre-seed stage to seed stage

The conversion ratio of the Georgian start-ups from the pre-seed stage to the seed stage is 4.18%; the ratio is 66.66% smaller compared to the 12.54% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the pre-seed stage is provided in the table below.

Table 78. Stakeholders´ performance in the pre-seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.1. The quality of the incubators	*Excellent performance*	The incubators offer excellent access to knowledge to entrepreneurs from the idea stage to the pre-seed stage, in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 4.1. The existence of crowdfunding platforms in the country	*On performance*	The crowdfunding platforms offer limited access to capital to start-ups from the idea stage to the early stage, in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 7.1. The quality of the entrepreneurial events	*On performance*	The entrepreneurial events offer limited access to market to start-ups from the idea stage to the seed stage, in the country´s ICT entrepreneurial ecosystem.

Seed stage: 0.92% Conversion ratio from the seed stage to early stage

The conversion ratio of the Georgian start-ups from the seed stage to the early stage is 0.92%; the ratio is 78.26% smaller compared to the 4.24% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the seed stage is provided in the table below.

Table 79. Stakeholders´ performance in the seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.2. The quality of the accelerators	*Acceptable performance*	The accelerators offer adequate access to knowledge to start-ups from the pre-seed stage to the seed stage, in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 2.3. The existence of international accelerators operating in the country	*Acceptable performance*	The international accelerators offer adequate access to knowledge to start-ups from the pre-seed stage to the seed stage, in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 5.3. The quality of business angels networks	*Non-existent*	There are no business angel networks in the country´s ICT entrepreneurial ecosystem, offering access-to-capital to start-ups from the pre-seed stage to the seed stage.
4.	Indicator 7.2. The existence of specialised entrepreneurial media and databases	*Optimal performance*	The specialised entrepreneurial media and databases offer optimal access to the market to start-ups from the idea stage to the early stage, in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.1. The existence of investment forums	*Acceptable performance*	The investment forums offer adequate access to market to start-ups from the seed stage to the early stage, in the country´s ICT entrepreneurial ecosystem.

Early stage: 0.12% Conversion ratio from the early stage to scale-up

The conversion ratio of the Georgian start-ups from the early stage to scale-up is 0.12%; the ratio is 80.76% smaller compared to the 0,64% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the early stage is provided in the table below.

Table 80. Stakeholders´ performance in the early stage

#	Indicator	Performance	Explanation
1.	Indicator 3.1. The existence of mentorship associations	*Non-existent*	There are no mentorship associations in the country´s ICT entrepreneurial ecosystem, offering access to knowledge to start-ups from the seed stage to the early stage.
2.	Indicator 3.2. The existence of the private sector´s entrepreneurial programmes	*Acceptable performance*	The private sector´s entrepreneurial programmes offer adequate access to knowledge to start-ups from the pre-seed stage to the early stage, in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 5.1. The quality of the local venture capital firms	*Non-existent*	There are no venture capital firms in the country´s ICT entrepreneurial ecosystem, offering access to capital to start-ups from the seed stage to the early stage.
4.	Indicator 5.2. The existence of international venture capital firms operating in the country	*Non-existent*	There are no international venture capital firms in the country´s ICT entrepreneurial ecosystem, offering access to capital to start-ups from the seed stage to the early stage.
5.	Indicator 8.2. The existence of national trade fairs and business forums	*On performance*	The national trade fairs and business forums offer limited access to market to start-ups from the seed stage to the early stage, in the country´s ICT entrepreneurial ecosystem.
6.	Indicator 10.1. The existence of the business facilities to support the start-up development	*On performance*	The business facilities offer limited access to resources to start-ups from seed stage to scale-ups, in the country´s ICT entrepreneurial ecosystem.

7.2. Diagnosis of the Maturity of the ICT Entrepreneurial Ecosystem in Georgia

The diagnosis below evaluates the performance of the ICT entrepreneurial ecosystem´s stakeholders' in Georgia such as educators, investors, connectors and facilitators. The evaluation is based on an analysis of 19 indicators graded from 0 to 4 *(see Annex 1: Indicator´s evaluation criteria).* Following that, the conclusions on current performance and recommendations for improvement are provided, excluding evaluation of the regulators / public sector performance *(for more explanations see the methodology in Chapter 1).*

KPI 1. Performance of the educators in talent generation

Indicator 1.1. The quality of universities´ entrepreneurial education programmes[52].

According to the country-level assessment, the academia in Georgia is taking first but active steps towards supporting innovation ecosystem development. Some universities have started providing programmes in entrepreneurship (*see also table below)*:

- Business and Technology University has a separate section for Innovation and Entrepreneurship that among other activities is also providing educational courses for its students.
- Batumi Shota Rustaveli State University (BSU) Innovation Centre was created to develop innovative competencies and entrepreneurial skills in engineering education.

Criteria: The percentage of universities that are offering entrepreneurial education programmes:

- **Grade 1:** The percentage of universities offering entrepreneurial education programmes is 3,77% in Georgia (two out of 53 universities), that is 74.23% percentage points less compared to 78% in the selected East-Central European countries.

Evaluation of the indicator:

- **On performance**: The universities entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R1. Creating universities´ entrepreneurial programmes.
- **High priority**: R2. Empowering universities by implementing specialised entrepreneurial programmes.
- **Low priority**: R3. Boosting universities by implementing high entrepreneurial education.

Table 81. List of universities offering entrepreneurial education programmes in Georgia

#	Name of university offering entrepreneurial education programmes
1	Business and Technology University
2	Batumi Shota Rustaveli State University

Indicator 1.2. The quality of technology education centres giving access to educational specialisation in emerging technologies.

According to the country-level assessment, Georgian Innovation and Communication Technologies (ICT) labour market analysis, conducted in 2017, indicated the ICT workforce as not sufficiently qualified to meet national and international market requirements.

The Georgian National Innovation Ecosystem (GENIE) project funded by WB and implemented by GITA aims to implement a collaborative skills strategy to improve digital skills of Georgian professionals in line with the economic and digital strategy of the country. ICT training programme in the scope of the GENIE project started in autumn

[52] Indicator 1.1 considers entrepreneurial education programmes as per standard curricula of universities.

2020 with a pilot phase aiming training of 500 IT specialists, which will be followed by a larger-scale phase to accommodate the training of 2,500 IT specialists.

There are also other short-term professional development courses active in the country: Geolab at Georgian American University (GAU), Gamelab at Ilia State University, and CG Multilab at the Georgian Institute of Public Affairs (GIPA).

The industry leaders concentrate on attracting talent and considering them later for job-opportunities. Some IT companies have invested in providing intensive training programmes and offered them appropriate fees. The largest hardware reseller UGT Group runs an IT knowledge training centre; the Information Technology Development Centre (ITDC) – formerly the largest web-development company and currently a cloud-services provider – offers training programme. Also, the leading mobile development company Lemondo has partnered with the University of Georgia (UG) in launching UG labs.

About 30 private centres (including university-based short-course programmes) are providing IT-related training regularly[53]. Offers include entry-level courses in graphics suites, operation systems, popular graphics/design suites and animation, web development, computers and networks administration. About half of the centres could be considered advanced, providing Cisco certification, databases, Java and .Net programming, IT projects management, mobile programming, game development, and other. However, there are no training centres in the regions providing basic level coding training.

Other examples of technology educational centres include *(see also table below):*

- IT HUB Tbilisi is the first educational centre of a new Eurasia format, where EPAM Systems trainers will train IT specialists, to meet the highest requirements of the tech labour market.
- CISCO Academy provides CCNA and CCNP courses training integrated with bachelor and master programmes.
- ORACLE Academy allows learning ORACLE technologies that are integrated with university programmes.
- Georgia Microsoft IT Academy offers free of charge courses to learn a full package of the MS programmes.
- MikroTik Academy offers online certification and IT courses through collaboration with the University of Georgia.
- Israeli Tech-hub is a high-tech teaching and training centre founded in 2018. Tech-hub is based in Silicon Valley Tbilisi. It implements a unique format for IT specialists' training, which is used in Israel's army.

Criteria: The estimated number of technology education entities giving access to specialisation in emerging technologies specialisation per million inhabitants:

- **Grade 2:** The number of technology education entities per million inhabitants in Georgia is 8.1 from a total number of tech educational facilities of 30; 16.3 less centres compared to 24.4 centres in the selected East-Central European countries.

Evaluation of the indicator:

- **Acceptable performance**: The technology education entities offer adequate access to specialisation in emerging technologies to talented individuals, in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R4. Creating technology education centres.
- **High priority**: R5. Empowering technology education centres by implementing educational specialisation in emerging technologies.

[53] Innovation and Technology in Georgia, Annual Report: 2017. USAID Governing for Growth in Georgia: https://www.pmo-bc.com/storage/app/uploads/public/5ce/795/dba/5ce795dba596c190438918.pdf, page 35.

- **Medium priority**: R6. Boosting technology education centres by implementing educational specialisation in emerging technologies.
- **Medium priority**: R7. Boosting technology education centres by funding capacity for R&D development.

Table 82. List of technology education centres in Georgia (most known centres, not a full list)

#	Name of technology education centre	Number of centres
1	Georgian Innovation and Technology Agency (GITA)	1 centre
2	Information Technology Development Centre	1 centre
3	IT Hub Tbilisi	1 centre
4	Cisco Academy	1 centre
5	Oracle Academy	1 centre
6	MicroTik Academy	1 centre
7	Microsoft IT Academy	1 centre
8	Israeli Tech-hub	1 centre
9	Lemondo UG Labs	1 centre
10	UGT	1 centre
11	Geolab	1 centre
12	Gamelab	1 centre
13	CG Multilab	1 centre

KPI 2. Performance of the educators from the idea to the pre-seed stage

Indicator 2.1. The quality of the incubators.

According to the country-level assessment, there are 9 incubators mainly located in the capital that help start-ups develop their products providing infrastructure to work, meet, learn and connect (*see table below*).

Several entrepreneurial projects, labs and centres are also in universities[54]. One notably example is the Georgian Ilia State University that offers incubation programmes, organises conferences, mentorship sessions and entrepreneurial events, and on average hosts sixty entrepreneurs per annum. Another examples are Creative Spark, an incubation project, backed by British Council. Creative Spark is active in several universities and aims at creative skills development, start-ups operational support with incubation, stimulation of universities collaboration with business sector and knowledge sharing. Entrepreneurship skills training, business idea development, incubation of business ideas, internships, online competitions and English language courses are planned within the framework.

In addition, Georgia Innovation and Technology Agency (GITA) is training up to 100 entrepreneurs per annum, with few scaling into the international market. They mention that most of the start-ups that complete their programme generate sales.

Criteria: The estimated number of incubators per million inhabitants:

[54] The Georgian Ilia State University, Georgian Technical University Innovation Centre, Iv. Javakhishvili Tbilisi State University, State University (ILIAUNI), Business and Technology University MIT Global Start-up Lab, International Black Sea University with "Youth Entrepreneurship and Innovation Club", Caucasus University with "Start-up Accelerator C10", Georgian American University with a pre-accelerator programme, The University of Georgia, Georgian Agrarian University

- **Grade 4**: The number of incubators per million inhabitants in Georgia is three from a total number of nine incubators; 0.60 more incubators compared to 2.04 incubators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active incubators:

- **Grade 4:** Georgian active incubators' average operating period is fine years as of the date of this report.

Evaluation of the indicator:

- **Excellent performance**: The incubators offer excellent access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R8. Creating incubators.
- **Medium priority**: R9. Empowering incubators by implementing specialised incubation programmes.
- **High priority**: R10. Boosting incubators by implementing "idea-stage" grant schemes.

Table 83. List of incubators in Georgia

#	Name of incubator	Funding year
1	Impact Hub	2016
2	Start-up Grind	2018
3	Start-up MARANI	2014
4	iHub	2014
5	Smart Up Georgia	2014
6	IT Incubator	2014
7	Business Incubator	2014
8	Business Development Centre	2011
9	Innovation and Development Foundation	2019

Indicator 2.2. The quality of the accelerators.

According to the country-level assessment, there are currently three accelerators in the local ecosystem as of the date of this report (*see table below*).

Two major international acceleration programmes were launched in 2020 in Georgia:

- 500 Startups Georgia – the first international, world-class accelerator programme, entering Georgia's market from summer 2020 and partnering with GITA and Bank of Georgia. 500 Startups Georgia is designed to promote entrepreneurship in Georgia, help develop the tech-ecosystem, connect with an international network and help companies fundraising.
- Georgian Women in Tech (GWIT) – programme within the US Market Access Centre (USMAC) accelerator. It is a rapid growth programme from Silicon Valley for women-owned and women-led start-ups. The programme gives access to dozens of Silicon Valley's most influential women executives, advisers, serial entrepreneurs, CEOs, venture capitalists, angel investors and plenty of other prominent players.

Tbilisi Accelerator "Spark", created in 2018 by shared support of Tbilisi City hall and EU (EU4Mayors), is a hub for entrepreneurs based in Tbilisi at the idea or pre-seed stage who need working space, resources, and professionals' assistance facilitation to transform a business idea into a business plan and be prepared for its accomplishment.

Criteria: The estimated number of accelerators per million inhabitants:

- **Grade 1**: The number of accelerators per million inhabitants in Georgia is 0.8 from a total number of three accelerators; 0.42 less accelerators compared to 1.22 accelerators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active accelerators:

- **Grade 1**: The Georgian accelerators´ average operating period of 1.7 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The accelerators offer adequate access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R11. Creating accelerators.
- **High priority**: R12. Empowering accelerators by implementing specialised pre-acceleration programmes.
- **Medium priority**: R13. Boosting accelerators by implementing seed-stage grant schemes.
- **Medium priority**: R14. Boosting accelerators through access to local and international markets.

Table 84. List of accelerators in Georgia

#	Name of accelerator	Founding year
1	500 Start-ups Georgia	2020
2	USMAC Women in tech	2020
3	Tbilisi Accelerator "Spark"	2018

Indicator 2.3. The existence of international accelerators operating in the country.

According to the country-level assessment, the Georgian ecosystem is connected with the international entrepreneurial programmes through two accelerators having affiliate representation in the country: 500 Startups and Georgian Women in tech (under USMAC) (*see table above*).

Criteria: The existence of international accelerators operating in the country:

- **Grade 3**: Two international accelerators are operating in the Georgian ICT ecosystem.

Evaluation of the indicator:

- **Acceptable performance**: The international accelerators offer adequate access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R15. Attracting international accelerators to the local ecosystem.

KPI 3. Performance of the educators in the seed stage

Indicator 3.1. The existence of mentorship associations.

According to the country-level assessment, the entrepreneurs meet industry mentors during entrepreneurial events and acceleration programmes. Apart from those, there is still no unified Georgian mentorship association that would help entrepreneurs connect with local and international mentors.

Criteria: The existence of mentorship associations operating in the country:

- **Grade 0**: No mentorship associations are operating in the Georgian ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no mentorship associations in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority**: R16. Creating mentorship associations.
- **Medium priority**: R17. Boosting mentorship associations by implementing access to service providers´ funding capacity.

Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

According to the country-level assessment, Georgia's banking sector is quite active in providing access to knowledge and capital to entrepreneurs and start-ups. The most prominent examples are as follows:

- Start-uperi is the programme of TBC Bank designed to support start-ups and stimulate new businesses. The programme includes financial and non-financial support for start-ups: loan for start-ups, operational products, training, individual consultation, media support, start-up events. The bank also offers IT Academy and Start-up Course to provide young entrepreneurs with the necessary knowledge and inspiration always to seek and bring forward exciting ideas, start their businesses and create new opportunities.
- The Bank of Georgia is also providing business loans and microloans to start-ups, supports the creation of FinTech start-ups and offers training courses for IT and business skills. The bank also supported the establishment of 500 Startups in Georgia.

Criteria: The existence of the private sector´s entrepreneurial programmes operating in the country:

- **Grade 3**: Two private sector´s entrepreneurial programme is operating in the Georgian ICT ecosystem.

Evaluation of the indicator:

- **Acceptable performance**: The private sector´s entrepreneurial programmes offer adequate access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Medium priority:** R18. Empowering specialised incubation by focusing on digitalisation of the local industry.

Table 85. List of private sector's entrepreneurial programmes in Georgia

#	Name of private sector's entrepreneurial programme	Founding year
1	Start-uperi	2018
2	The Bank of Georgia Entrepreneurship Development Center	2019

KPI 4. Performance of the investors from the idea to the pre-seed stage

Indicator 4.1. The existence of crowdfunding platforms in the country.

According to the country-level assessment, Crowdfund.ge is the only Georgian crowdfunding platform established in 2015. They offer three types of investment instruments: equity-based, loan-based and perk-based. As of now, one project has been invested.

Criteria: The existence of crowdfunding platforms operating in the country:

- **Grade 3**: One crowdfunding platform is operating in the Georgian ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The crowdfunding platforms offer limited access to capital to start-ups from the idea stage to the early stage, in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R26. Creating crowdfunding platforms.
- **Medium priority:** R27. Empowering crowdfunding platforms through access to a critical mass of investors.

Table 86. List of crowdfunding platforms in Georgia

#	Name of crowdfunding platform
1	Crowdfund.ge

KPI 5. Performance of the investors from the seed to the early stage

Indicator 5.1. The quality of the local venture capital firms.

According to the country-level assessment and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, no venture capital firms existed in Georgia in 2020.

Established in 2017, the Georgian Venture Capital Association (GVCA) aims to develop venture capital and private equity industry to stimulate innovation and growth. The mission of GVCA is to promote the development and consolidation of venture capital and the private equity sector in Georgia through building a favourable investment climate, creating venture capital legislative framework, encouraging the entrepreneurship culture, supporting start-ups and building the bridge between Georgian and international investors.

Criteria: The number of venture capital firms per million inhabitants:

- **Grade 0**: The number of venture capital firms per million inhabitants in Georgia is 0; whereas in the selected East-Central European countries it is 1.73.

Evaluation of the indicator:

- **Non-existent:** There are no venture capital firms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority:** R20. Creating venture capital firms.
- **Low priority:** R19. Empowering venture capital firms through fund of funds programmes.
- **Low priority:** R21. Boosting ventures capital firms through access to international markets.

Indicator 5.2. The existence of international venture capital firms operating in the country.

According to the country-level assessment, there are no foreign venture capital firms present in Georgia. The Georgian Venture Capital Association mentioned that they collaborate with venture capital firms from Silicon Valley.

Criteria: The existence of international venture capital firms operating in the country:

- **Grade 0**: No international venture capital firms are operating in the Georgian ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no international venture capital firms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority:** R22. Attracting international venture capital firms to the local ecosystem.

Indicator 5.3. The quality of the business angels networks.

According to the interviews with the ecosystem stakeholders, the lack of private capital is the main issue, with practically no domestic and foreign investors considering coming to Georgia. Angel Investor Club of Georgia has been established recently. Before there was no business angels network or community in Georgia, but rather individual investors investing at the idea stage and sharing their experience and contacts in the business sphere.

According to the Market Assessment for Digital Innovation and Scale-up Initiative in the Eastern partner countries, for the years 2017-2019, the local investors' total volume of investments in the start-up pre-seed and seed stages amounted to €197,000 with no investments for the later stages[55]. During the interviews, the ecosystem stakeholders mentioned that around five angel investments had been made from 2017 to 2020.

EU in cooperation with the World Bank and partnering with GITA started initial addressing of business angels market issues and launched the "Start-up Investors Programme" in 2019, intended to help new and existing investors to improve their investing knowledge and skills, enabling them to make better investment decisions. The Investors Programme works in parallel with the Investment Readiness Programme (IRP), which prepares companies for engaging private investors, particularly equity investment. The programme aims to establish the first-ever Georgian Business Angels community in the short term.

Criteria: The number of business angel networks per million inhabitants:

- **Grade 1:** No business angels network is operating in the Georgian ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no business angel networks in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the pre-seed stage to the seed stage.

Recommendations:

- **High priority:** R23. Creating business angels networks.
- **Medium priority:** R24. Empowering business angels networks by strengthening the investment expertise.
- **Low priority:** R25. Boosting business angels networks through co-investment matching programmes.

KPI 6. Performance of the connectors in talent generation

Indicator 6.1. The existence of talent generation events[56].

According to the country-level assessment, there are six serial talent generation events in the Georgian ICT ecosystem (*see table below*) that hosts around 50 events per year, raising awareness of entrepreneurship and training business skills. Based on the available information, few of these events are described in more details below:

- Tbilisi Science and Innovation Festival covers all regions of Georgia. They are organised by the Ministry of Education, Science, Culture and Sports and the Shota Rustaveli Georgian National Science Foundation. The festival's goal is to popularise science and innovation, schoolchildren and students' interest in science and innovation. Various interactive scientific-cognitive events held within the festival's framework create great interest.
- Youth Innovation Summit invites participants, who created successful innovative companies at an early age, to share their experiences. The second block of the summit introduces participants to the opportunities that helped the speakers to develop their creative business ideas.
- Start-up Weekend Tbilisi is a popular event where IT developers, designers, product managers and start-up enthusiasts present their business ideas, form a team, listen to experienced managers' advice, and get a chance to start their own business.

[55] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".
[56] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

- Start-up Grind Tbilisi is a local chapter of Start-up grind – the world's largest community, which connects start-ups, founders, innovators, and creators; identifies successful start-ups, shares their experiences, inspires young inhabitants and more. They organise different local events and conferences, bringing famous speakers, investors and entrepreneurs, and connecting local entrepreneurs. They also support bringing the most promising local start-ups at the annual Start-up Grind event in Silicon Valley to connect them with potential investors.

Criteria: The existence of relevant talent generation events in the country:

- **Grade 3**: Six relevant talent generation events are operating in the Georgian ICT ecosystem.

Criteria: The average operating period of the country's active talent generation events:

- **Grade 2**: The Georgian talent generation events´ average operating period is 2.8 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The talent generation events offer adequate access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R28. Creating talent generation events.
- **High priority:** R29. Empowering talent generation events through sponsorship.

Table 87. List of talent generation events in Georgia

#	Name of talent generation event	Founding year
1	Start-up Weekend Tbilisi	2020
2	Youth Innovation Summit	2016
3	Product Tank Tbilisi	2020
4	Start-up Grind Tbilisi	2014
5	Garage 48 (hackathons)	2017
6	Tbilisi Science and Innovation Festival	2016

KPI 7. Performance of the connectors from the idea to the pre-seed stage

Indicator 7.1. The quality of the entrepreneurial events[57].

According to the country-level assessment, the Georgian entrepreneurial ecosystem hosts a few events for start-ups to meet mentors, the private sector and other ecosystem stakeholders (*see table below)*.

TechSummit is a two-day event. Its purpose is to deepen cooperation among participating countries to develop an innovative ecosystem, share experiences and connect with potential partners. TechSummit is organised by the Innovation and Technology Agency of the Ministry of Economy and Sustainable Development, the Union of Technological Entrepreneurship (FPT) and the Polish Investment and Trade Agency (PAIH).

The annual Tbilisi Entrepreneurship Summit aims to support Georgia's start-up ecosystem, facilitate access to finances, attract foreign investment and promote Georgian start-ups.

Global Entrepreneurship Week is an annual event organised by the Georgia Innovation and Technology Agency (GITA) and Enterprise Georgia.

[57] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

ProductTank Tbilisi is an informal meet-up that brings together the local product community – Start-up Founders, Product Managers, Designers, and Developers – to share their experience. Founded in 2010 in London, today ProductTank spans over 185 cities.

Criteria: The number of entrepreneurial events per million inhabitants:

- **Grade 2**: The number of entrepreneurial events per million inhabitants in Georgia is 1.14 from a total number of four recurrent events; 0.38 less compared to 1.52 entrepreneurial events per million inhabitants in the selected East-Central European countries.

Criteria: The average estimated number of attendees per entrepreneurial event:

- **Grade 0**: The average number of attendees per entrepreneurial event in Georgia is 150 compared to 2,200 average number of attendees per entrepreneurial event in the selected East-Central European countries.

Criteria: The average operating period of the country's active entrepreneurial events:

- **Grade 2**: The Georgian entrepreneurial events´ average operating period is 2.3 years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The entrepreneurial events offer limited access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R30. Creating entrepreneurial events.
- **Medium priority:** R31. Empowering entrepreneurial events through sponsorship.
- **Low priority:** R32. Boosting entrepreneurial events through internationalisation.

Table 88. List of entrepreneurial events in Georgia

#	Name of entrepreneurial event	Founding year	Number of participants in 2019
1	Technology Summit	2019	Unknown
2	Tbilisi Entrepreneurship Summit	2020	Unknown
3	Global Entrepreneurship Week	2016	Around 150
4	Product Tank Tbilisi	2018	150

Indicator 7.2. The existence of specialised entrepreneurial media and databases.

According to the country-level assessment, there are several social media and web pages through which the entrepreneurs can learn about industry news and opportunities (*see table below)*.

'Start-UP.ge' was created as entrepreneurial media to help entrepreneurs to find relevant information on starting a business. It is also interesting for investors who want to invest money. Here they are given information on how to buy an existing business or share, finance a new business, or acquire the franchise of a well-known international company.

'Entrepreneur Georgia' provides news on local and international entrepreneurial and business markets and access to online books, webinars, and consultations.

'Business Media Georgia' is a media platform that brings together business & economics news (TV, Web, Digital) in Georgia and worldwide. The Facebook page is quite active, with more than 130,000 followers.

Other Facebook pages with big auditoriums for entrepreneurial and business sector news are the GITA Facebook page and the 'Enterprise Georgia' Facebook page.

There are no local databases in the country, which provide aggregated information of the local ecosystem players and activities.

Criteria: The existence of specialised entrepreneurial media in the country:

- **Grade 3:** Five specialised entrepreneurial media are operating in the Georgian ICT ecosystem.

Criteria: The existence of relevant ICT entrepreneurial ecosystem databases:

- **Grade 0**: No ICT entrepreneurial ecosystem´s database is operating in the Georgian ICT ecosystem.

Criteria: The average operating period of the country's active specialised entrepreneurial media and databases:

- **Grade 4**: The Georgian specialised entrepreneurial media and ecosystem´s databases average operating period is 7.8 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The specialised entrepreneurial media and databases offer optimal access to the market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R33. Creating ICT ecosystem databases.

Table 89. List of specialised entrepreneurial media in Georgia

#	Name of specialised entrepreneurial media	Founding year
1	Start-UP.ge	2019
2	Entrepreneur Georgia	2019
3	Georgia Innovation and Technology Agency (GITA)	2014
4	Enterprise Georgia	2014
5	Business Media Georgia	2014

KPI 8. Performance of the connectors from the seed to the early stage

Indicator 8.1. The existence of investment forums[58].

According to the country-level assessment, there are 3 annual investments forums active in the country as of the date of this analysis.

- Global Business and Investment Forum is an annual event hosted in Tbilisi. The forum features a range of guest speakers worldwide, including government officials, business executives, potential investors, CEOs and entrepreneurs. One of the forum's core objectives is to serve as a platform to connect the world's top businesses and the most successful start-ups. Additionally, the forum sets out to assemble local and international delegates to facilitate resource sharing and mutual support.
- The annual forum titled "Bia Investment Forum: Georgia – Land of Opportunities" aims at bringing together over 500 businessmen, investors, government representatives and international organisations interested in questions concerning Georgia's economy and the region. The forum provides potential investors with the opportunity to hear about the country's macroeconomic, legal and tax advantages from leading experts in government and business.
- Global Start-up Foundation.

It is worthy to mention some additional one-event investment forums organised in the country. A notably example is Kakheti International Investment Forum organised by Enterprise Georgia in 2019. Hosting of international

[58] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

investors served as a platform for public and private sector representatives to explore investment opportunities, business potential and partnership possibilities in the region.

Criteria: The existence of investment forums in the country:

- **Grade 3:** Three investment forum are operating in the Georgian ICT ecosystem.

Criteria: The average operating period of the country's active investment forums:

- **Grade 3**: The Georgian investment forums´ average operating period is two years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The investment forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R34. Creating investment forums.
- **High priority:** R35. Empowering investment forums through sponsorship.
- **Medium priority:** R36. Boosting investment forums through internationalisation.

Table 90. List of investment forums in Georgia

#	Name of investment forum	Founding year
1	Global Business and Investment Forum	2017
2	Bia Investment Forum: Georgia - Land of Opportunities	2019
3	Global Start-up Foundation	2019

Indicator 8.2. The existence of national trade fairs and business forums[59].

According to the country-level assessment, several trade fairs and business forums are organised by Georgia's associations and the private sector (*see table below)*. Many of those are hosted on the premises of Expo Georgia. The relevant trade shows and exhibitions are the Tourism Fair, Agro-Export Forum, Wine Expo, Blockchain and Crypto Conference, and International Multidisciplinary Conference on Economics, Business, Engineering and Social Sciences.

Business Georgia started conducting business forums to improve communication and information exchange between business, governmental and international sectors and the audience.

Criteria: The existence of national trade fairs and business forums in the country:

- **Grade 3:** Six national trade fairs and business forums are operating in the Georgian ICT ecosystem.

Criteria: The average operating period of the country's active national trade fairs and business forums:

- **Grade 4**: The Georgian national trade fairs and business forums´ average operating period is 11.8 years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The national trade fairs and business forums offer limited access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

[59] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Recommendations:

- **High priority:** R37. Empowering business forums by connecting private sector with ICT ecosystem actors.
- **Low priority:** R38. Boosting the promising start-ups through accessing to international trade fairs.

Table 91. List of trade fairs and business forums in Georgia

#	Name of trade fair or business forum	Founding year
1	Business Georgia	2016
2	Tourism Fair	1999
3	Agro-Export Forum	2001
4	Wine Expo	2009
5	Blockchain and Crypto Conference Georgia	2018
6	International Multidisciplinary Conference on Economics, Business, Engineering and Social Sciences	2012

KPI 9. Performance of the facilitators in the idea stage

Indicator 9.1. The quality of the tech facilities to support the start-up creation.

According to the country-level assessment, since 2016, several projects were implemented, including building broadband infrastructures, two tech parks, four manufacturing FabLabs, three ILabs, and several other innovation centres[60]; GITA also aims to make more research and innovation centres across the country. The most well-known tech facilities are listed in the table below.

The FabLabs offer access to the modern technologies, most advanced machinery and devices (e.g. 3D printer, laser cutter, CNC router, vacuum forming machine, PCB machine, programmable sewing machine, and other) to generate and test ideas[61]. They are established in Tbilisi as well as in the regions, which are often integrated to Community Innovation Centers (CIC).

GameLab, a framework of GITAs' grant programme, was founded to promote an innovative ecosystem in Georgia, commercialisation of innovations and technologies. It is a computer and gaming laboratory equipped with the latest technologies that commercialise ideas on the world market. Training centre in GameLab offers many certification courses: Game-design, Voice design, Programmer, Developer, Storyteller, Level-designer, Creative director, Artis, 2D and 3D artist, Animator, Game tester-analytic, Concept-artist.

UG Start-up Factory offers co-working space, a meeting room, free access to an innovative laboratory. The acceleration period lasts three months, during which start-ups receive the following complimentary services: workspace 24/7 at the Start-up Factory Innovation Centre, access to high-tech equipment and innovative infrastructure.

In addition, the Technology Transfer Centers (TTCs) have been established by support of GITA in 2019 in couple of universities (Tbilisi State University, University of Georgia, Ilia State University) participating in EU/WB technology transfer pilot project. The TTCs connect to each other scientists/innovators and companies/organization, which want to integrate new technologies and innovations in their processes. TTCs also aims to establish start-up processes, such as pre-acceleration and incubation programmes.

Criteria: The number of tech facilities per million inhabitants:

- **Grade 4**: The number of tech facilities per million inhabitants in Georgia is 2.4 from a total number of nine tech facilities; 1.08 more compared to 1.32 tech facilities per million inhabitants in the selected East-Central European countries.

[60] Innovation and Technology in Georgia, Annual Report: 2017. USAID Governing For Growth in Georgia: https://www.pmo-bc.com/storage/app/uploads/public/5ce/795/dba/5ce795dba596c190438918.pdf, page 50.
[61] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".

Criteria: The average number of yearly founded spin-offs per tech facilities:

- **Grade 0**: The average number of yearly founded spin-offs per tech facilities in Georgia from 2017 to 2020 is 0, whereas in the selected East-Central European countries from 2017 to 2020 the yearly founded spin-offs per tech facilities was 2.03.

Criteria: The average operating period of the country's active tech facilities:

- **Grade 4**: The Georgian tech facilities´ average operating period is 4.7 years as of the date of this report.

Evaluation of the indicator:

- **Excellent performance**: The tech facilities offer excellent access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R39. Creating tech parks.
- **High priority:** R40. Empowering tech facilities through technology clustering.

Table 92. List of tech facilities in Georgia

#	Name of tech facility	Spin-offs / year	Founded year	Free working space	Laboratories	Access to interns
1	FabLab TSU	Unknown	2015	Yes	Yes	Yes
2	FabLab Iliauni	Unknown	2014	Yes	Yes	Yes
3	FabLab BSU	Unknown	2015	Yes	Yes	Yes
4	FabLab ATSU	Unknown	2015	Yes	Yes	Yes
5	UG Start-up Factory	Unknown	2015	Yes	No	Yes
6	Zugdidi Techpark	Unknown	2016	Yes	Yes	Yes
7	Telavi Techpark	Unknown	2020	Yes	Yes	Yes
8	Batumi Techpark	Unknown	2020	Yes	Yes	Yes
9	Akhmeta Innovation Centre	Unknown	2018	Yes	Yes	Yes
10	Rukhi Innovation Centre	Unknown	2019	Yes	Yes	Yes
11	Kaspi Innovation Centre	N/A	2020	Yes	Yes	Yes
12	Gurjaani Innovation Centre	N/A	2020	Yes	Yes	Yes
13	Baghdati Innovation Centre	N/A	2016	Yes	Yes	Yes
14	Kharagauli Innovation Centre	N/A	2016	Yes	Yes	Yes
15	Choporti Innovation Centre	N/A	2016	Yes	Yes	Yes

Indicator 9.2. The existence of the tech facilities to support the start-up creation in small urban and rural areas.

According to the country-level assessment, the authorities aim to develop an innovation infrastructure network to ensure equal access and regional coverage. State vision of innovation infrastructure development has two tires:

- Regional. It is presented by Regional Innovation Hubs (RIH). RIHs combine and provide access to incubators, training centres, laboratories, high technology showrooms, co-working areas, conference halls, and recreational areas, facilitating the country's high technological industry. Three RIHs were operational by end of 2020 (Zugdidi, Telavi and Batumi).
- Local. It is presented by its satellite Community Innovation Centers (CICs). CICs are mini-tech parks, offering a community the same services locally as tech parks on a smaller scale. The aim is to encourage

the population living in rural, small and large cities in various innovative activities. CICs also serve as spaces for work and different training and seminars. Seven CICs were operational as of the middle of 2020 (in Rukhi, Akhmeta, Kaspi, Gurjaani, Baghdati, Kharagauli, and Choporti), with three additional being planned.

Construction of two RIH (Telavi, Batumi) and four CIC (Rukhi, Akhmeta, Kaspi, Gurjaani) has been financed through World Bank Georgia National Innovation Ecosystem (WB GENIE) project. These hubs also have industrial, innovative laboratories equipped with high-tech equipment to allow local entrepreneurs to turn their idea into reality *(see table above)*.

Criteria: The existence of tech facilities in small urban and rural areas operating in the country:

- **Grade 3**: Seven tech facilities in small urban and rural areas are operating in the Georgian ICT ecosystem.

Evaluation of the indicator:

- **Optimal performance**: The tech facilities in small urban and rural areas offer optimal access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R42. Creating tech parks in small urban areas.

KPI 10. Performance of the facilitators from the pre-seed to the early stage

Indicator 10.1. The existence of the business facilities to support the start-up development.

According to the country-level assessment, two business facilities support Georgia's start-up development (*see table below*):

- IHUB Tbilisi offers a place where start-ups have the opportunity to work. In addition to the shared workspace, they create a community, conduct educational events and workshops to deepen knowledge and help visitors use their experience to turn their idea into a full-fledged business.
- Impact Hub Tbilisi provides co-working space, organised events and meet-ups, and creates an entrepreneurial environment for working on business ideas.

Criteria: The existence of business facilities in the country:

- **Grade 3:** Two business facilities are operating in the Georgian ICT ecosystem.

Criteria: The country's active business facilities average operating period:

- **Grade 4**: The Georgian business facilities´ average operating period is 5.5 years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The business facilities offer limited access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R41. Boosting the promising start-ups through access to business centres.

Table 93. List of co-working spaces and business centres in Georgia

#	Name of co-working space or business centre	Founding year
1	Tbilisi: Impact Hub	2016
2	Tbilisi: iHub	2015

Involvement of the public sector in the development of the ecosystem

The level of involvement of the public entities such as development agencies, international organisations and government is key to the ecosystem's growth. Although these entities performance is not evaluated in this analysis, the authors summarise their involvement in the ICT entrepreneurial ecosystem's development in the sections below.

International organisations

According to the country-level assessment, international organisations are offering start-ups access to knowledge, capital, market and resources:

1) The most notable international organisations involvements in offering access to knowledge for the start-ups is realized through Georgian ICT Cluster[62], a collaborative platform for ICT industry stakeholders, created by GIZ programme in 2018. Platform supports the creation of education programmes on ICT, including start-up events, R&D projects, training of trainers, internships and mentorships, among others.
2) The most notable international organisations involvements in offering access to capital in the idea and pre-seed stages are through World Bank funded Georgia National Innovation Ecosystem (GENIE) project. In 2016, the World Bank approved a $40 million loan to Georgia under the GENIE project (2016-2023) to increase innovative activities of firms and individuals and their participation in Georgia's digital economy. The project is implemented by GITA and provides two types of matching grants:
    - Start-up Matching Grant (₾100,000 or €29,100) with 10% matching requirements.
    - Innovation matching grant (₾650,000 or €164.000) with 50% of matching conditions.
3) The most notable international organisations involvement in offering access to market to the start-ups is delivered by Sweden funded Georgian Business Close to Europe (GEclose2EU) programme. The programme is implemented by the Economic Policy Research Centre (EPRC), in partnership with Enterprise Georgia Agency and financial support of the Government of Sweden. The project runs for three years (2018-2021) and aims to support SMEs in Georgia by increasing their visibility on European markets and creating new internationalisation opportunities. One of the target spheres of project beneficiaries is the information and communication technologies.
4) The most notable international organisations involvement in offering access to resources to start-ups is delivered by GENIE project. The Government of Georgia has secured support from the World Bank Group for the project in the amount of €19,5 million. One of the project components is innovation infrastructure that aims:
    - Develop a network of Regional Innovation Hubs (RIH) and Community Innovation Centres (CICs) in selected cities, towns and villages of Georgia.
    - Design and pilot a Broadband-for-Development (BfD) programme to support the increase in adoption and use of broadband internet services and advanced information technology by eligible households and eligible micro, small, and medium enterprises (MSMEs), with a focus on rural areas.

Government involvement as an ecosystem builder

According to the country-level assessment, from 2014, Government of Georgia declared private sector development through innovation and technology as one of the key priority in Country's main long term social-economic development strategy "Georgia 2020". Ince 2014, two agencies have been established under the Ministry of Economy and Sustainable Development of Georgia:

1) GITA to support the innovation ecosystem development through providing access to finance, access to knowledge, infrastructure and regulation framework. GITA supports pre-seed stage start-ups with small grant schemes; recognises the existing gaps in the ecosystem and provides programmes aiming to help prospective start-ups acknowledge the full cycle of innovative product or service development via mentorship, training and capacity-building events. In addition, tailored training in finance, marketing, project management, business idea development, and other, is provided to GITA Business Incubator residents.

[62] Georgian ICT Cluster: https://ictcluster.ge/en/skills-and-education/.

Another important initiative of GITA is Start-up Accelerator where start-ups are going through training programmes in business modelling, relationships with investors, customer identification and attraction, as well as marketing and other relevant areas.

2) Enterprise Georgia (EG) to support entrepreneurship development and approve the law of innovation.

Association Agreement (AA) and Deep and Comprehensive Free Trade Agreement (DCFTA) signed with the EU in 2014 created an additional window of opportunity and benefits for Georgian SMEs and start-ups. The EU supported the Georgian government in elaborating "The SME Development Strategy 2016-2020" and its action plan set innovation and research development as one of the strategic directions[63]. The Strategy and Action plan was successfully renewed for 2020-2025. In addition, to increase coverage and support, Government of Georgia approved "Broadband Development Strategy 2020-2025" and its action plan earlier 2020. Priority directions of the strategy are: ICT skill and demand development; Attract investments and Increase competition.

In 2016, per Prime Ministers initiative, two new programmes were introduced:

- "Startup Georgia" programme to support development of the start-ups, implemented by GITA,
- "Strat-up Georgia" subsidiary created by JSC Partnership Fund - the state-owned investment fund, established by the Government, to promote investment in Georgia by providing co-financing in projects at their initial stage of development from ₾15,000 (€4,400) to ₾100,000 (€29,100). . The total budget of a particular project is not limited. The programme consists of an innovative and a high-tech component, covering aerospace production, automobiles, artificial intelligence, biotechnology, bioinformatics, computer engineering, computer science, information technology, nanotechnologies, nuclear physics, electromagnetic radiation, robotics, semiconductors. As of June 2020, 20 start-ups received grants for ₾100,000 (€29,100), in total ₾2 million (€583,000)[64].

Under a separate state-funded "micro grant programme" administered by GITA, Georgian tech start-ups can receive the support of around €5,000 for such purposes as prototyping and €2,000 for study visits and organization of innovation competitions/events.

Government involvement as a regulator

According to the country-level assessment, the Tax Code[65] is the principal source of tax law uniting the tax and customs legislation: there are only six types of business taxes, none of them exceeding 20% (corporate income tax, personal income tax, VAT, import tax, property tax and excise duties). There are no capital gains, inheritance, wealth, property transfer, social, branch remittance, or other. The country's taxation system is robust in e-filling and e-payments, electronic VAT invoices, advanced ruling, and accelerated services. All taxes are payable online. Georgian enterprises can be granted a small business status (a certificate of small business) and paying 1% of tax payment for small enterprises. It takes three days to open a business in Georgia.

National Intellectual Property Centre of Georgia (SAKPATENTI) is responsible for Intellectual Property Rights legislation for science, research ethics and related issues.

According to the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries[66], the factors complicating the implementation of venture projects and execution of venture deals include:

1) Legislative gap in terms of internationally joint venture projects structuring instruments (convertible loans, options, indemnities, tag along, drag along and similar).
2) Lack of judicial practice on matters related to the contractual use of internationally widespread instruments for venture project structuring.
3) Taxation system level. There are no tax preferences for venture capital firms and business angels.

[63] The SME Development Strategy 2016-2020, Ministry of Economy and Sustainable Development of Georgia, 2016.
[64] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".
[65] Law Of Georgia Tax Code of Georgia: https://matsne.gov.ge/en/document/download/1043717/93/en/pdf.
[66] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".

7.3. Recommendations by priority in Georgia

Below the experts list the **high and medium priority** recommendations necessary to empower the ICT entrepreneurial ecosystem of Georgia.

Also, the detailed list of all main recommendations for capacity builders acting in the six Eastern Partnership countries is in Chapter 11.

Table 94. Priority recommendations for empowering the Georgian ICT entrepreneurial ecosystem

Recommendation	Priority	Area	Stage
R1. Creating universities´ entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R2. Empowering universities by implementing specialised entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R5. Empowering technology education centres by implementing educational specialisation in emerging technologies	HIGH	KNOWLEDGE	IDEA
R6. Boosting technology education centres by implementing educational specialisation in emerging technologies	MEDIUM	KNOWLEDGE	IDEA
R7. Boosting technology education centres by funding capacity for R&D development	MEDIUM	KNOWLEDGE	IDEA
R9. Empowering incubators by implementing specialised incubation programmes	MEDIUM	KNOWLEDGE	PRE-SEED
R10. Boosting incubators by implementing “idea-stage” grant schemes	HIGH	KNOWLEDGE	PRE-SEED
R12. Empowering accelerators by implementing specialised pre-acceleration programmes	HIGH	KNOWLEDGE	SEED
R13. Boosting accelerators by implementing seed-stage grant schemes	MEDIUM	KNOWLEDGE	SEED
R14. Boosting accelerators by accessing to local and international markets	MEDIUM	KNOWLEDGE	SEED
R16. Creating mentorship associations	HIGH	KNOWLEDGE	EARLY
R17. Boosting mentorship associations by implementing access to services providers´ funding capacity	MEDIUM	KNOWLEDGE	EARLY
R18. Empowering specialised incubation by focusing on digitalisation of the local industry	MEDIUM	KNOWLEDGE	EARLY
R20. Creating venture capital firms	HIGH	CAPITAL	EARLY
R22. Attracting international venture capital firms to the local ecosystem	HIGH	CAPITAL	EARLY
R23. Creating business angels networks	HIGH	CAPITAL	SEED

Recommendation	Priority	Area	Stage
R24. Empowering business angels networks by strengthening the investment expertise	MEDIUM	CAPITAL	SEED
R26. Creating crowdfunding platforms	HIGH	CAPITAL	PRE-SEED
R27. Empowering crowdfunding platforms through access to a critical mass of investors	MEDIUM	CAPITAL	PRE-SEED
R29. Empowering talent generation events through sponsorship	HIGH	MARKET	IDEA
R30. Creating entrepreneurial events	HIGH	MARKET	PRE-SEED
R31. Empowering entrepreneurial events through sponsorship	MEDIUM	MARKET	PRE-SEED
R33. Creating ICT ecosystem databases	HIGH	MARKET	SEED
R35. Empowering investments forums through sponsorship	HIGH	MARKET	SEED
R36. Boosting investments forums through internationalisation	MEDIUM	MARKET	SEED
R37. Empowering business forums by connecting private sector with ICT ecosystem	HIGH	MARKET	EARLY
R40. Empowering tech facilities through technology clustering	HIGH	RESOURCES	IDEA

Chapter 8: MOLDOVA

This diagnosis of the performance of the ICT entrepreneurial ecosystem stakeholders in Moldova is structured in the following manner:

- Current status of ICT entrepreneurial ecosystem performance through comparison of the conversion ratios of ICT start-ups in different growth stages with select European and other countries.
- Diagnosis of the performance of the different ecosystem stakeholders: educators, investors, connectors and facilitators by evaluating 19 indicators *(see Chapter 3).*
- Prioritisation of the main recommendations for further developing the ICT entrepreneurial ecosystem in Moldova.

The detailed methodology of the diagnosis is provided in Chapter 1.

8.1 Status of the ICT entrepreneurial ecosystem in Moldova

This subchapter provides information on:

1. Start-ups strength, by providing the comparison of the start-ups conversion ratios from the idea stage to the early stage with select European and other more mature ecosystems.
2. Ecosystems stakeholders status in the different stages of the start-ups' lifecycle.

To analyse the maturity of the ICT entrepreneurial ecosystem in Moldova, first the strength of the start-ups according to the conversion ratios from the idea stage to the early stage, was compared with the ratios of the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania). These countries have been selected due to relevant similarities with the Eastern partner countries such as ICT ecosystem size, targeted IT industries and their size, historical and cultural development path. In addition, the experts have compared the conversion ratios of the Moldova start-ups with well-developed ecosystems of four selected Western European countries (Germany, France, United Kingdom and Spain), as well as with more mature ecosystems like California (Silicon Valley) and Israel *(see tables below).*

The conversion ratios have been calculated based on the information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries" and the largest ICT entrepreneurial databases Dealroom and CrunchBase. The latter sources provide information on a large number of start-ups and investment rounds to calculate the conversion ratios that are close to reality. However, the reader should bear in mind that the mentioned sources do not provide comprehensive data on all start-ups operating in the compared countries, especially in the idea and pre-seed stages, where start-ups have not yet received investments. Also, these sources do not collect the information on start-ups in the early to scale-up stage that have grown without the need for external investments. Nevertheless, these estimated ratios include a significant sample of companies, allowing to make an assumption about the actual conversion ratios of the start-ups in the country.

The experts have compared the conversion ratios of the Moldovan start-ups and other selected countries and the differences are provided in the tables below.

Table 95. Conversion ratios compared with selected East-Central European countries

#	Country	Ratio idea to pre-Seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**EAST-CENTRAL EUROPE AVERAGE**	**0,06%**	**12,54%**	**4,24%**	**0,64%**	**0,19%**
1.1	**LITHUANIA**	0,11%	14,23%	4,84%	0,79%	0,30%
1.2	**ESTONIA**	0,06%	12,49%	4,96%	0,53%	0,14%
1.3	**POLAND**	0,04%	11,91%	3,21%	1,25%	0,27%
1.4	**BULGARIA**	0,05%	12,26%	4,56%	0,28%	0,11%
1.5	**ROMANIA**	0,04%	11,79%	3,64%	0,36%	0,14%
2	**MOLDOVA**	**0,05%**	**3,90%**	**0,36%**	**0,06%**	**0%**
2-1	**DIFFERENCE**	**-20,49%**	**-68,89%**	**-91,51%**	**-90,61**	**-100%**

Table 96. Conversion ratios compared with selected Western European countries

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**WESTERN EUROPE AVERAGE**	**0,11%**	**15,94%**	**4,66%**	**1,47%**	**0,59%**
1.1	**GERMANY**	0,06%	16,60%	5,13%	2,09%	0,79%
1.2	**FRANCE**	0,06%	15,92%	4,87%	1,93%	0,67%
1.3	**UNITED KINGDOM**	0,21%	16,23%	5,32%	1,27%	0,63%
1.4	**SPAIN**	0,10%	15,01%	3,31%	0,58%	0,27%
2	**MOLDOVA**	**0,05%**	**3,90%**	**0,36%**	**0,06%**	**0%**
2-1	**DIFFERENCE**	**-56,99%**	**-75,53%**	**-92,27%**	**-95,92%**	**-100%**

Table 97. Conversion ratios compared with California and Israel

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**CALIFORNIA**	0,73%	22,23%	4,89%	2,43%	0,68%
2	**ISRAEL**	0,26%	23,21%	6,11%	3,66%	0,72%
3	**MOLDOVA**	**0,05%**	**3,90%**	**0,36%**	**0,06%**	**0%**
3-(1+2)	**DIFFERENCE**	**-95,20%**	**-91,42%**	**-96,73%**	**-99,01%**	**-100%**

As illustrated in the tables above, the Moldovan start-ups' conversion rates are significantly lower in almost all stages than the ecosystems in East-Central and Western European countries and Silicon Valley.

Moldavian start-ups conversion rate from seed stage to early stage is significantly lower than the selected East-Central European countries due to the difficulties that the start-ups are facing to validate their business models locally. Also, the conversion ratio from early stage to scale-ups is significantly lower due to the start-ups' difficulties to grow internationally.

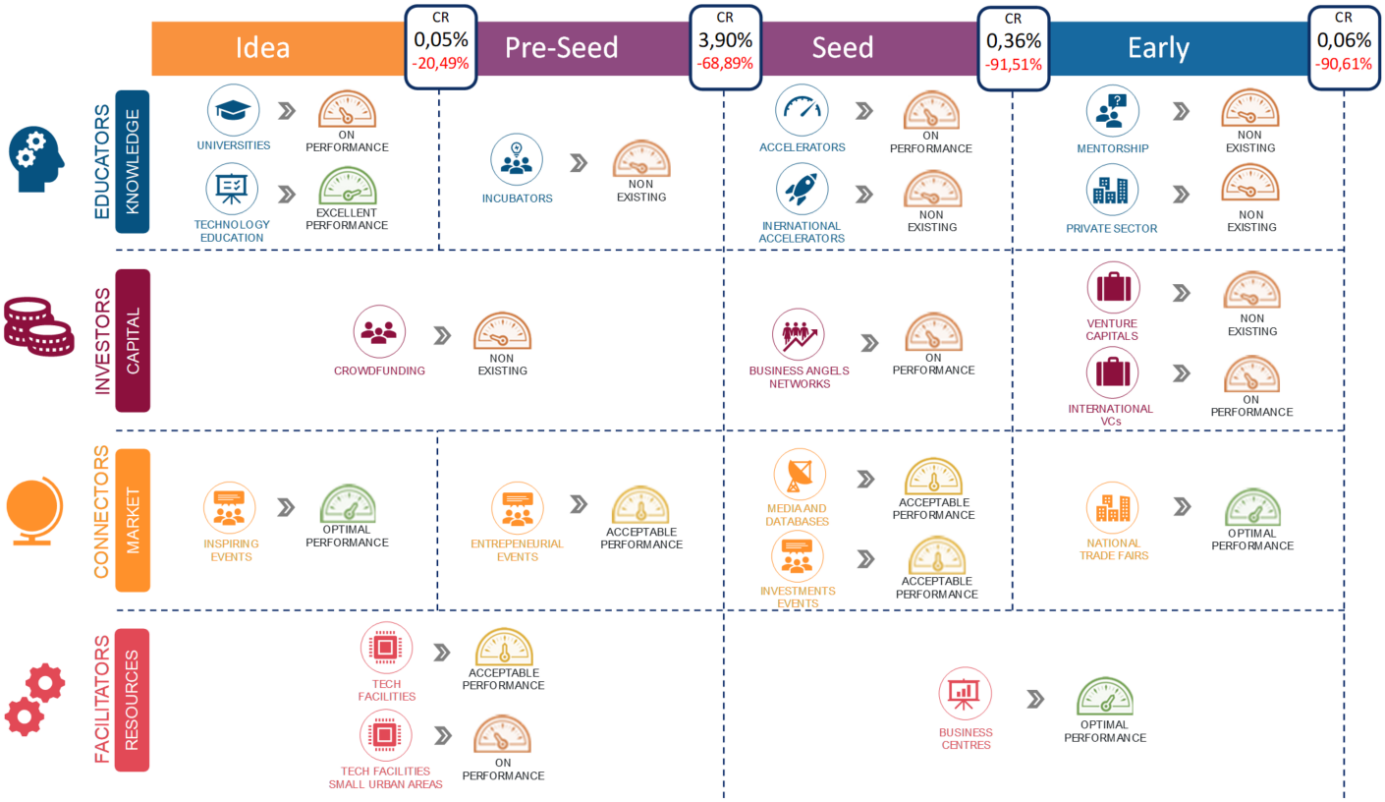
The conversion ratios are impacted by the ecosystem stakeholders involvement in start-ups' development and growth. The diagnosis below analyses the performance of those stakeholders that support start-ups' growth from the idea stage to the early stage. Once the start-up becomes a company with international perspectives or scale-up, the local entrepreneurial ecosystem stakeholders relevance is reduced, and start-up growth is ensured by its own resources.

The figure below presents the level of stakeholders' performance at each stage of the start-ups' growth. It was developed to offer the reader a clear view of the main strengths and weaknesses of the ICT entrepreneurial ecosystem in Moldova. The figure provides information on:

1. The conversion ratios (CR) of Moldova ecosystem start-ups from the idea to the early stage.
2. The difference in the Moldovan start-ups' conversion ratios compared with the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania) from the idea to the early stage.
3. The ecosystem status by stakeholder type (from educators to facilitators) and start-up growth stage (from the idea stage to the early stage).

The majority of the stakeholders are involved in several stages of the start-up lifecycle, but in the figure, they are assigned only to the stages their involvement is the most active.

Figure 16. Moldovan ICT entrepreneurial ecosystem performance status (CR – conversion ratio)



The performance of the stakeholders at each growth stage of the start-ups are evaluated below.

Idea stage: 0.05% Conversion ratio from the idea stage to pre-seed stage

The conversion ratio of the Moldovan individuals having a business idea to entrepreneurs creating a start-up in a pre-seed stage is 0.05%; the ratio is 20.49% smaller compared to the 0.06% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the idea stage is provided in the table below.

Table 98. Stakeholders´ performance in the idea stage

#	Indicator	Performance	Explanation
1.	Indicator 1.1. The quality of universities´ entrepreneurial education programmes	*On performance*	The universities entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 1.2. The quality of technology education centres giving access to specialisation in emerging technologies	*Excellent performance*	The technology education entities offer excellent access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 6.1. The existence of talent generation events	*Optimal performance*	The talent generation events offer optimal access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 9.1. The quality of the tech facilities to support the start-up creation	*Acceptable performance*	The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 9.2. The existence of the tech facilities to support the start-up creation in small urban and rural areas	*On performance*	The tech facilities in small urban and rural areas offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Pre-seed stage: 3.90% Conversion ratio from the pre-seed stage to seed stage

The conversion ratio of the Moldovan start-ups from the pre-seed stage to the seed stage is 3.90%; the ratio is 68.89% smaller compared to the 12.54% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the pre-seed is provided in the table below.

Table 99. Stakeholders´ performance in the pre-seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.1. The quality of the incubators	*Non-existent*	There are no incubators in the country´s ICT entrepreneurial ecosystem offering access to knowledge to entrepreneurs from the idea stage to the pre-seed stage
2.	Indicator 4.1. The existence of crowdfunding platforms in the country	*Non- existent*	There are no crowdfunding platforms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the idea stage to the early stage.
3.	Indicator 7.1. The quality of the entrepreneurial events	*Acceptable performance*	The entrepreneurial events offer adequate access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Seed stage: 0.36% Conversion ratio from the seed stage to early stage

The conversion ratio of the Moldovan start-ups from the seed stage to the early stage is 0.36%; the ratio is 91.51% smaller compared to the 4.24% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the seed stage is provided in the table below.

Table 100. Stakeholders´ performance in the seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.2. The quality of the accelerators	*On performance*	The accelerators offer limited access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 2.3. The existence of international accelerators operating in the country	*Non-existent*	There are no international accelerators in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the pre-seed stage to the seed stage.
3.	Indicator 5.3. The quality of business angels networks	*On performance*	The business angels networks offer limited access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 7.2. The existence of specialised entrepreneurial media and databases	*Acceptable performance*	The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.1. The existence of investment forums	*Acceptable performance*	The investment forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Early stage: 0.06% Conversion ratio from the early stage to scale-up

The conversion ratio from the Moldovan start-ups from the early stage to scale-up is 0.06%; the ratio is 90.61% smaller compared to the 0.64% in the selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the early stage is provided in the table below.

Table 101. Stakeholders´ performance in the early stage

#	Indicator	Performance	Explanation
1.	Indicator 3.1. The existence of mentorship associations	*Non-existent*	There are no mentorship associations in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the seed stage to the early stage.
2.	Indicator 3.2. The existence of the private sector´s entrepreneurial programmes	*Non-existent*	There is no private sector´s entrepreneurial programmes in the country´s ICT entrepreneurial ecosystem that offer access to knowledge to start-ups from the pre-seed stage to the early stage.
3.	Indicator 5.1. The quality of the local venture capital firms	*Non-existent*	There are no venture capital firms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the seed stage to the early stage.
4.	Indicator 5.2. The existence of international venture capital firms operating in the country	*On performance*	The international venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.2. The existence of national trade fairs and business forums	*Optimal performance*	The national trade fairs and business forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
6.	Indicator 10.1. The existence of the business facilities to support the start-up development	*Optimal performance*	The business facilities offer optimal access to resources to start-ups from the seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

8.2. Diagnosis of the Maturity of the ICT entrepreneurial ecosystem in Moldova

The diagnosis below evaluates the performance of the ICT entrepreneurial ecosystem stakeholders' in Moldova such as educators, investors, connectors and facilitators. The evaluation is based on the analysis of 19 indicators graded from 0 to 4 (*see Annex 1: Indicator´s evaluation criteria*). Following that the conclusions on current performance and recommendations for improvement are provided, excluding evaluation of the regulators / public sector performance (*for more explanations see the methodology in Chapter 1*).

KPI 1. Performance of the educators in talent generation

Indicator 1.1. The quality of universities´ entrepreneurial education programmes[67].

According to the country-level assessment, although there are many of universities with IT-related specialities, only three of them may be considered as important actors in the tech innovation and entrepreneurship ecosystem (*see them listed in table below)*:

- The Technical University of Moldova (TUM) is the leading ICT workforce supplier and supporter of entrepreneurship in the country. TUM has an entrepreneurship development centre to help the students in this endeavour. It organises many hackathons, innovation fairs, and ICT career orientation events.
- The State University of Moldova has an incubator for innovation called Inventica USM.
- The Academy of Economic Studies is also offering courses on business administration and management.

It is worth mentioning, that Tekwill recently launched the 1st pilot of tech entrepreneurship course at the Technical University of Moldova. The pilot was launched within its Startup Academy programme with support from USAID and Sweden government. The course will be taught in English, for 15 weeks, starting in early March 2021, to a carefully selected group of second- and third-year students from IT related majors. After piloting, the course will be implemented, starting in autumn 2021, in 4 Moldovan universities.

Criteria: The percentage of universities that are offering entrepreneurial education programmes:

- **Grade 1**: The percentage of universities offering entrepreneurial education programmes is 10.7% in Moldova (three out of 28 Universities), 67.3 percentage points less compared to 78% of the selected East-Central European countries.

Evaluation of the indicator:

- **On performance**: The universities entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R1. Creating universities´ entrepreneurial programmes.
- **High priority**: R2. Empowering universities´ by implementing specialised entrepreneurial programmes.
- **Low priority**: R3. Boosting universities´ by implementing high entrepreneurial education.

Table 102. List of universities offering entrepreneurial education programmes in Moldova

#	Name of university offering entrepreneurial education programmes
1	The State University of Moldova
2	The Technical University of Moldova
3	The Academy of Economic Studies

[67] Indicator 1.1. considers entrepreneurial education programmes as per standard curricula of universities.

Indicator 1.2. The quality of technology education centres giving access to educational specialisation in emerging technologies[68].

According to the country-level assessment, there are several private IT educational centres (*see table below)*. They provide paid training courses and certifications for adults. There are also the Educational Robotics programme taught in 200 schools, Future Classroom programme offered in 42 schools and "Tekwill in every school" programme that will be offered in 234 schools in the following years as a set of elective courses, relevant for ICT careers.

The Tekwill Educational Centre has been created to fill in the IT knowledge gap and develop entrepreneurial talent. The centre provides training courses on entrepreneurship and technology, facilities and organises events. Start-up Moldova, managed by Tekwill and the first dedicated programme to support IT entrepreneurship in the country, offers support in the digitalisation of SMEs, education, infrastructure, consulting, mentoring, access to events and funding opportunities.

Several facilities have been built dedicated to research and development in digital fabrication and engineering for the last few years. There is currently a **network of FabLabs**: one large at TUM, and six small regional FabLabs, of which three launched in 2018, and the other three in February 2021. Those are spread in different cities throughout Moldova. The most popular are FabLab Chisinau, Cahul FabLab, Ungheni FabLab, Microlab Engineering Club at the Technical University of Moldova. The facilities offer hardware and digital tools, co-working space and educational programmes. All these are operating in partnerships between local public organisations and international donors.

There are also programmes offered without physical centres, Junior Achievement Entrepreneurial education programme offered on over 100 schools, Educational Robotics programme[69] offered in 200 schools.

IT is also worthy to mention Optim Project that was launched recently. The project is financed by the Swiss Agency for Development and Cooperation and is implemented by HELVETAS Swiss Intercooperation in partnership with Moldovan Chamber of Commerce. The overall goal of the project is to contribute to increased access to improved economic opportunities for youth, women, and men in Moldova. One of the project objects will target the development of the digital skills among the youth, men, and women through enhanced educational offers of private training providers.

There is also a number of unpaid/paid tech education courses for school age students offered by private players.

Criteria: The estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants:

- **Grade 4:** The number of technology education entities per million inhabitants in Moldova is 95 from a total number of tech educational facilities of 338; 70.6 centres more compared to 24.4 centres in the selected East-Central European countries.

Evaluation of the indicator:

- **Excellent performance**: The technology education entities offer excellent access to emerging technologies specialisation to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R4. Creating technology education centres.
- **Low priority**: R5. Empowering technology education centres by implementing educational specialisation in emerging technologies.
- **High priority**: R6. Boosting technology education centres by implementing educational specialisation in emerging technologies.
- **High priority**: R7. Boosting technology education centres by funding capacity for R&D development.

[68] Indicator 1.2. refers to the STEM education that is generating technology/engineering talents for teams of start-ups.
[69] No specific reference to this programme is available. More information can be found in Year Five Annual Report FY20 of Moldova Competitiveness Project, page 56.

Table 103. List of technology education centres in Moldova

#	Name of technology education centre	Number of centres
1	Tekwill Educational Centre	1 centre
2	Future Classroom	1 centre
3	Regional FabLabs	6 labs
4	Technical University Moldova	1 lab

KPI 2. Performance of the educators from the idea to the pre-seed stage

Indicator 2.1. The quality of the incubators.

According to the country-level assessment, there is currently no tech incubation programme for Moldova entrepreneurs.

Since 2019 there is a pre-acceleration programme YEP Moldova that offers opportunities on entrepreneurship and idea development for the school age and university students.

In December 2013, six business accelerators in the Republic of Moldova, funded through Organization for Small and Medium Enterprises Sector Development (ODIMM), formed the Moldovan Business Incubators Network (RIAM). The network comprises 11 business accelerators that provide office space with affordable prices and access to consulting services.

None of these business accelerators are considered incubators, or accelerators, since they do not have the mission to support entrepreneurs on the start-up creation and scale, and do not provide any incubation or acceleration educational programme such “business idea validation”, “team-building”, “business model validation” and “product validation”.

Criteria: The estimated number of incubators per million inhabitants:

- **Grade 0**: The number of incubators per million inhabitants in Moldova is 0; compared to 2.04 incubators per million inhabitants in the selected East-Central European countries.

Evaluation of the indicator:

- **Non-existent**: There are no incubators in the country´s ICT entrepreneurial ecosystem offering access to knowledge to entrepreneurs from the idea stage to the pre-seed stage

Recommendations:

- **High priority**: R8. Creating incubators.
- **Low priority**: R9. Empowering incubators by implementing specialised incubation programmes.
- **Low priority**: R10. Boosting incubators by implementing “idea-stage” grant schemes.

Indicator 2.2. The quality of the accelerators.

According to the country-level assessment, until the beginning of 2020, there are two accelerators in the ICT sector in Moldova (*see table below)*.

At the beginning of 2020, private firm XY Partners launched an acceleration programme in partnership with Tekwill. While the latter offers space and covers mentoring and other operational costs, XY Partners provides access to capital through convertible notes to entrepreneurs at the idea stage. They host around 20 start-ups per annum. XY Partners is already preparing for the next stage, envisioning a grant fund of up to L5 million (€ 240,000) dedicated to Moldovan start-ups at the pre-seed and seed stages. Discussions are being held with local and international public institutions, owners of large companies, and foreign tech funds already operating in neighbouring Romania and Ukraine.

Another initiative, called Dreamups Innovation Campus, offers a pre-acceleration educational programme. Since 2020, it is also an acceleration programme for start-ups. They provide practical training, mentorship, co-working

space and start-up events; and host around 20 start-ups per annum. They organised the Founder Institute´s programme for several consecutive years. They developed an online platform UpFactory (acceleration, pre-acceleration, Startup School). The director mentioned that only a few graduates had generated sales after completing the programme.

Criteria: The estimated number of accelerators per million inhabitants:

- **Grade 1**: The number of accelerators per million inhabitants in Moldova is 0.56 from a total number of two accelerators; 0.66 less accelerators compared to 1.22 accelerators per million inhabitants in the selected East-Central European countries.

Criteria: The average operating period of the country's active accelerators:

- **Grade 1**: The Moldovan accelerators´ average operating period is one year as of the date of this report.

Evaluation of the indicator:

- **On performance**: The accelerators offer limited access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R11. Creating accelerators.
- **Medium priority**: R12. Empowering accelerators by implementing specialised pre-acceleration programmes.
- **Low priority**: R13. Boosting accelerators by implementing seed-stage grant schemes.
- **Low priority**: R14. Boosting accelerators through access to local and international markets.

Table 104. List of accelerators in Moldova

#	Name of accelerator	Founding year
1	XY Partners	2020
2	Dreamups Innovation Campus	2020

Indicator 2.3. The existence of international accelerators operating in the country.

According to the country-level assessment, no international accelerators are operating in Moldova.

However, several collaborations between the local ecosystem stakeholders and international entrepreneurial events are worth mentioning: Techstars Startup Weekend and Startup Week, Seedstars, Start-up Grind, Climate Launchpad, and other.

Criteria: The existence of international accelerators operating in the country:

- **Grade 0**: No international accelerators are operating in the Moldovan ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no international accelerators in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the pre-seed stage to the seed stage.

Recommendations:

- **High priority**: R15. Attracting international accelerators to the local ecosystem.

KPI 3. Performance of the educators in the seed stage

Indicator 3.1. The existence of mentorship associations.

According to the country-level assessment, the entrepreneurs meet industry mentors during entrepreneurial events and acceleration programmes. Apart from those, there is still no unified Moldovan mentorship association via which entrepreneurs could connect to local and international mentors. Although there are some mentorship programmes, which are not specialised in ICT entrepreneurship.

Criteria: The existence of mentorship associations operating in the country:

- **Grade 0**: No mentorship associations are operating in the Moldovan ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no mentorship associations in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority**: R16. Creating mentorship associations.
- **Medium priority**: R17. Boosting mentorship associations by implementing access to service providers´ funding capacity.

Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

According to the country-level assessment, there is no established entrepreneurial programme from the private sector for developing the ICT ecosystem.

However, it is relevant to mention that there are few players who sponsor the entrepreneurial programmes. Foundation Orange Moldova funds the organisation of events and supports the “Startup School” by Dreamups for high-school students. Moldova Agroindbank MAIB is focused on sponsoring of the fintech programmes.

It is also relevant to mention that the Technical University of Moldova is receiving sponsorship from IT companies for practical laboratories and branded learning spaces.

Criteria: The existence of the private sector´s entrepreneurial programmes operating in the country:

- **Grade 0**: There is no private sector´s entrepreneurial programme is operating in the Moldovan ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no private sector´s entrepreneurial programmes in the country´s ICT entrepreneurial ecosystem that offer access to knowledge to start-ups from the pre-seed stage to the early stage.

Recommendations:

- **High priority:** R18. Empowering specialised incubation by focusing on digitalisation of the local industry.

KPI 4. Performance of the investors from the idea to the pre-seed stage

Indicator 4.1. The existence of crowdfunding platforms in the country.

According to the country-level assessment, there is no crowdfunding platform in Moldova.

Currently, the USAID Moldova and School of International and Public Affairs (SIPA) are in discussions with the government promoting the creation of Moldovan crowdfunding platforms.

Criteria: The existence of crowdfunding platforms operating in the country:

- **Grade 0**: No crowdfunding platforms are operating in the Moldovan ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no crowdfunding platforms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the idea stage to the early stage.

Recommendations:

- **High priority:** R26. Creating crowdfunding platforms.
- **Low priority:** R27. Empowering crowdfunding platforms through access to a critical mass of investors.

KPI 5. Performance of the investors from the seed to the early stage

Indicator 5.1. The quality of the local venture capital firms.

According to the country-level assessment, and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, there is no local VC fund in Moldova.

Two international financial entities are operating in Moldova: a private equity firm called Horizon Capital and the NCH Advisors Inc. Both are not relevant for the diagnosis since they invest in traditional businesses outside the ICT sector and not impacting the Moldovan ICT entrepreneurial ecosystem.

Based on Start-up Moldova's investment data, the Moldovan start-ups have raised approximately $1,9 million[70] as of today. Most of the funding is raised through private investments such as friends, family and personal capital.

Criteria: The number of venture capital firms per million inhabitants:

- **Grade 0**: No venture capital firms are operating in the Moldovan ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no venture capital firms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority:** R20. Creating venture capital firms.
- **Low priority:** R19. Empowering venture capital firms through fund of funds programmes.
- **Low priority:** R21. Boosting ventures capital firms through access to international markets.

Indicator 5.2. The existence of international venture capital firms operating in the country.

According to the country-level assessment, no international venture capital firms are operating in Moldova.

No precise data on foreign investments attracted by Moldovan start-ups was found because many of them have incorporated their businesses abroad, making it hard to keep tracking start-ups growth.

Criteria: The existence of international venture capital firms operating in the country:

- **Grade 0**: No international venture capital firms are operating in the Moldovan ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no international venture capital firms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the seed stage to the early stage.

Recommendations:

- **High priority:** R22. Attracting international venture capital firms to the local ecosystem.

Indicator 5.3. The quality of the business angels networks.

According to the country-level assessment, and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, there is one business angels network called “Business Angels Moldova”.

Business Angel Moldova made two investments in 2019 and five investments in 2020[71].

Criteria: The number of business angels networks per million inhabitants:

- **Grade 3:** One business angels network is operating in the Moldovan ICT ecosystem.

[70] Startup Moldova database: https://startupmoldova.digital/startup-ecosystem/.
[71] EU4Digital Facility study “Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries”, page 56.

Criteria: The average number of investments per local business angels network from 2017 to 2020:

- **Grade 1**: The average number of investments per local business angels network in Moldova from 2017 to 2020 is 2.33 from a total 7 investments; 16.87 less compared to the average of 15.87 number of investments in the selected East-Central European countries.

Criteria: The average operating period of the country's active business angels networks:

- **Grade 2**: There is only one business angels network in Moldova with operating period of a two years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The business angels network offers limited access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R23. Creating business angels networks.
- **Medium priority:** R24. Empowering business angels networks by strengthening the investment expertise.
- **Low priority:** R25. Boosting business angels networks through co-investment matching programmes.

Table 105. List of business angels networks in Moldova

#	Name of business angels network	Founding year	Number of investments
1	Business Angels Moldova	2018	7

KPI 6. Performance of the connectors in talent generation

Indicator 6.1. The existence of talent generation events[72].

According to the country-level assessment, the Moldovan entrepreneurial ecosystem hosts a variety of talent generation regularly events, like start-up weekends, thematic hackathons, and other (see table below). One of the most significant events are the following:

- Startup Weekend and Startup Week are one of the leading catalysts for start-up creation and entrepreneurial education worldwide. The mission of the event is to educate and inspire entrepreneurs and give them the motivation and networking opportunities they need to take the next step in creating a successful start-up company
- The Rockit Conference is an event where the participants learn of the new shifts and developments in the digital environment and meet inspirational speakers.
- YEP! Moldova is an international platform that helps students launch a Start-up, using the TOP Universities methodology. It organised many start-up battles and hackathons, where interested entrepreneurs can meet peers and share ideas.
- Startup Academy is a programme that aims to identify, stimulate and multiply the innovative and business potential, dedicated to all those interested in the field of IT entrepreneurship, development of innovative products and services. The Academy often organises thematic hackathons, online training and boot camps for entrepreneurs.

The most critical player of the ecosystem – Tekwill is organising various hackathons, talks, and conferences for those interested in creating their own business. Since recently, Tekwill also supports programs dedicated to verticals, such as FinTech, AgTech, MedTech, etc. and digitalisation of SMEs.

Other talent attraction events in the Moldovan ecosystem are the Garage48, GirlGoIT events, events organised by the FabLabs, Arduino Day, Microtik User Meeting Moldova, NASA Space Challenge Moldova and Moldova Cyber

[72] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Week. There is also a serious of one-stand and networking events, workshops, dinners focused on start-ups and entrepreneurship offered by various ecosystem players.

Criteria: The existence of relevant talent generation events in the country:

- **Grade 3**: 16 relevant talent generation events are operating in the Moldovan ICT ecosystem.

Criteria: The average operating period of the country's active talent generation events:

- **Grade 4**: The Moldovan talent generation events´ average operating period is five years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The talent generation events offer optimal access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R28. Creating talent generation events.
- **Medium priority:** R29. Empowering talent generation events through sponsorship.

Table 106. List of talent generation events in Moldova

#	Name of talent generation event	Founding year
1	Techstars Startup Weekend	2011
2	Techstars Startup Week	2017
3	Rockit conference	2015
4	ICT Career Orientation events by Tekwill	2016
5	Hackathons, webinars, seminars, talks and events by Tekwill	2016
6	Startup Grind	2016
7	YEP! Moldova	2018
8	Garage48 hackathon (various local organisers)	2016
9	Engineering, IoT, AI, robotics and embedded programming hackathons and events by Microlab	2018
10	FabLab hackathons, meetups and events on digital fabrication, 3D printing and more	2018
11	GirlsGoIT STEM camps and boot camps	2016
12	Arduino day	2018
13	Microtik User Meeting Moldova	2015
14	NASA Space Challenge Moldova	2019
15	Moldova Cyber Week	2017
16	Startup Academy	2018

KPI 7. Performance of the connectors from the idea to the pre-seed stage

Indicator 7.1. The quality of the entrepreneurial events[73].

According to the country-level assessment, Moldova's popular entrepreneurial events are the Seedstars Moldova and Chișinău Demo Day (*see table below)*:

- The Moldovan chapter of Seedstars world event allows the Moldovan start-ups to pitch their products and attract funding.
- Chisinau Demo Day aims to spotlight the products and technologies developed by local start-ups. The teams have the opportunity to showcase their products to community leaders and members and gain valuable and constructive feedback on their work.

Criteria: The number of entrepreneurial events per million inhabitants:

- **Grade 1**: The number of entrepreneurial events per million inhabitants in Moldova is 0.56 from a total number of two recurrent events; 0.96 less compared to 1.52 entrepreneurial events per million inhabitants in the selected East-Central European countries.

Criteria: The average estimated number of attendees per entrepreneurial event:

- **Grade 0**: The average number of attendees per entrepreneurial event in Moldova is 100; 2,100 less compared to 2,200 average number of attendees per entrepreneurial event in the selected East-Central European countries.

Criteria: The average operating period of the country's active entrepreneurial events:

- **Grade 3**: The Moldovan entrepreneurial events´ average operating period is three years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The entrepreneurial events offer adequate access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R30. Creating entrepreneurial events.
- **High priority:** R31. Empowering entrepreneurial events through sponsorship.
- **Medium priority:** R32. Boosting entrepreneurial events through internationalisation.

Table 107. List of entrepreneurial events in Moldova

#	Name of entrepreneurial event	Founding year	Number of participants in 2019
1	Chișinău Seedstars	2016	100
2	Chișinău Demo Day	2018	100

Indicator 7.2. The existence of specialised entrepreneurial media and databases.

According to the country-level assessment, there is still a lack of professional media channels and journalists dedicated to publishing industry news. Entrepreneurs learn of industry events and opportunities through online platforms and social media pages.

Startup Moldova has recently started creating a database on Moldova and ecosystem players' investment landscape. There is a Russian language site with a rubric powered by Tekwill and regularly covers events, start-ups, companies, founders and professionals from IT in the form of interviews.

[73] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Also, there is a brand new publication managed by Dreamups posts about innovation and tech entrepreneurship: the site is only available in Romanian.

There are no local databases in the country, which provide aggregated information of the local ecosystem players and activities.

Criteria: The existence of specialised entrepreneurial media in the country:

- **Grade 3:** Two specialised entrepreneurial media are operating in the Moldovan ICT ecosystem.

Criteria: The existence of relevant ICT entrepreneurial ecosystem databases:

- **Grade 0**: No ICT entrepreneurial ecosystem´s databases are operating in the Moldovan ICT ecosystem.

Criteria: The country's active specialised entrepreneurial media and databases average operating period:

- **Grade 1**: The Moldovan specialised entrepreneurial media and ecosystem´s databases average operating period is one year as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R33. Creating ICT ecosystem databases.

Table 108. List of specialised entrepreneurial media in Moldova

#	Name of specialised entrepreneurial media	Founding year
1	Startup Moldova	2020
2	Blueprint by Dreamups	2020

KPI 8. Performance of the connectors from the seed to the early stage

Indicator 8.1. The existence of investment forums[74].

According to the country-level assessment, the ecosystem lacks investment forums. From 2005 a few such forums were organised, such as the Moldova International Investment Forum and Invest in Moldova, but those were not recurring.

The first edition of the Chisinau Investment Forum took place in 2019. The main goal of the forum was to intensify foreign investments' attraction into Chisinau municipality's economy, increasing and improving Chisinau Municipality's image abroad. Currently, no information about the next editions of the event is available.

Criteria: The existence of investment forums in the country:

- **Grade 3:** One investment forum is operating in the Moldovan ICT ecosystem.

Criteria: The average operating period of the country's active investment forums:

- **Grade 1**: The Moldovan investment forums´ average operating period is one year as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The investment forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

[74] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Recommendations:

- **Low priority:** R34. Creating investment forums.
- **High priority:** R35. Empowering investment forums through sponsorship.
- **Medium priority:** R36. Boosting investment forums through internationalisation.

Table 109. List of investment forums in Moldova

#	Name of investment forum	Founding year
1	Chisinau Investment Forum	2019

Indicator 8.2. The existence of national trade fairs and business forums[75].

According to the country-level assessment, Moldova hosts several sectoral expos and trade fairs. The popular ones are Moldova Business Week, Made in Moldova, Expo Business Moldova, International SMEs Conference and other industry-based expos (*see also table below)*:

- Moldova Business Week gathers public and private sector representatives to discuss its investment and development opportunities and directions. The event also hosts successful entrepreneurs and corporate managers.
- In 2019, the 12th edition of the International SMEs conference took place. Each time, the conference covers a specific industry discussing trends and opportunities. During the event business, environment-related competitions take place. The last time was the selection of the Entrepreneur of the Year.
- Expo Business Moldova aims to showcase and promote national products and services from different sectors. During the event, the participants can meet business associations, companies, financial institutions, academia, etc.

Criteria: The existence of national trade fairs and business forums in the country:

- **Grade 3:** 11 national trade fairs and business forums are operating in the Moldovan ICT ecosystem.

Criteria: The average operating period of the country's active national trade fairs and business forums:

- **Grade 4**: The Moldovan national trade fairs and business forums´ average operating period is 13 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The national trade fairs and business forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Medium priority:** R37. Empowering business forums by connecting private sector with ICT ecosystem.
- **High priority:** R38. Boosting the promising start-ups through access to international trade fairs.

[75] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Table 110. List of trade fairs and business forums in Moldova

#	Name of trade fair or business forum	Founding year
1	Moldova Business Week	2018
2	Fabricat in Moldova (eng: Made in Moldova)	2002
3	Expo Business Moldova	2020
4	International SMEs conference	2009
5	MOLDAGROTECH	2019
6	MOLDCONSTRUCT	1998
7	MOLDENERGY	2000
8	FOOD AND DRINKS	2018
9	MOLDMEDIZIN & MOLDDENT	1997
10	INFOINVENT	2007
11	TOURISM. LEISURE. HOTELS	1998

KPI 9. Performance of the facilitators in the idea stage

Indicator 9.1. The quality of the tech facilities to support the start-up creation.

According to the country-level assessment, several tech hubs have been established such as the Tekwill centre in Chisinau and others (*see table below*).

Tekwill is hosted by the prestigious Technical University of Moldova (TUM) and serves as an ICT Excellence Centre, operated by Moldova's ICT companies association.

Several facilities have been built dedicated to research and development in digital fabrication and engineering for the last few years. There is currently a network of FabLabs. The most popular are FabLab Chisinau, Cahul FabLab, Ungheni FabLab, and Microlab Engineering Club at the Technical University of Moldova. The facilities offer hardware and digital tools, co-working space and educational programmes. All these are operating in partnerships between local public organisations and international donors. Yet, not all labs target the start-ups, instead of supporting science and technology development.

Generator Hub is the first co-working hub in Moldova, among the top three IT hubs in Chisinau, which provides co-working spaces and hosts various ICT training and community events.

iHub is a trendy co-working space on the Technical University of Moldova's premises, in the heart of Chisinau.

Dreamups Innovation Campus offers a small space, but focuses more on content development, having its pre-acceleration, acceleration programmes, the Startup School for youth, an online platform, and recently launched a specialised news portal.

Other relevant start-up facilities are Circle lab, placed in the TUM premises and Artcor creative hub.

Also, in Cahul, a newly launched project - Startup City Cahul - once developed will offer aspiring entrepreneurs an IT environment to create their start-ups, receive education and mentorship.

Criteria: The number of tech facilities per million inhabitants:

- **Grade 3**: The number of tech facilities per million inhabitants in Moldova is 2,28 from a total number of eight tech facilities; 0.96 more compared to 1.32 tech facilities per million inhabitants in the selected East-Central European countries.

Criteria: The average number of annually founded spin-offs per tech facilities:

- **Grade 0**: The average number of yearly founded spin-offs per tech facilities in Moldova from 2017 to 2020 is 0. Whereas in the selected East-Central European countries from 2017 to 2020 the yearly founded spin-offs per tech facilities is 2.03.

Criteria: The average operating period of the country's active tech facilities:

- **Grade 4**: The Moldovan tech facilities´ average operating period is 4.3 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R39. Creating tech parks.
- **Medium priority:** R40. Empowering tech facilities through technology clustering.

Table 111. List of tech facilities in Moldova

#	Name of tech facility	Spin-offs / year	Founding year	Free working space	Laboratories	Access to interns
1	Tekwill	0	2015	Yes	No	Yes
2	Generator hub	0	2015	Yes	No	Yes
3	iHub	0	2016	Yes	No	Yes
4	Dreamups Innovation Campus	0	2016	Yes	No	Yes
5	FabLab Chișinău	0	2018	Yes	Yes	Yes
6	Circle	0	2018	Yes	Yes	Yes
7	Artcor	0	2019	Yes	Yes	Yes
8	Startup City Cahul	0	2020	Yes	Yes	No

Indicator 9.2. The existence of the tech facilities to support the start-up creation in small urban and rural areas.

According to the country-level assessment, the capital Chisinau concentrates almost entirely on ICT activity. Recently, efforts have been undertaken to develop the sector in some other parts of the country, such as Balti (North) and Cahul (South).

The Tekwill experience is being replicated now in the south of the country, in Cahul, with plans to expand this experience in other regions[76]. In Balti, a regional Innovation Centre is already under construction, on the Balti University premises, as a public-private partnership between Government of Moldova, USAID, Sweden, UK Aid and Balti Free Economic Zone[77].

Criteria: The existence of tech facilities operating in the country's small urban and rural areas:

- **Grade 0**: No tech facility in small urban and rural areas is yet operating in the Moldovan ICT ecosystem. Startup City Cahul will launch its facility in 2022, as well as a regional Innovation Center in Balti.

Evaluation of the indicator:

[76] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".
[77] Construction of Centre for Innovation and Technology Transfer in North Development Region started in Balti: https://gov.md/en/content/construction-center-innovation-and-technology-transfer-north-development-region-started.

- **On performance**: The tech facilities in small urban and rural areas are under development that will offer access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R42. Creating tech parks in small urban areas.

KPI 10. Performance of the facilitators from the pre-seed to the early stage

Indicator 10.1. The existence of the business facilities to support the start-up development.

According to the country-level assessment, apart from the entrepreneurs' tech facilities, there are five business centres in Moldova hosting tech start-ups and offering relevant services and facilities. Those business centres are the Digital Park, Sky Tower, ZTower High-tech park and business centre, Le Roi Business Centre and Kentford (*see table below*). All of them are located in the capital Chisinau.

Criteria: The existence of business facilities in the country:

- **Grade 3:** Five business facilities are operating in the Moldovan ICT ecosystem.

Criteria: The average operating period of the country's active business facilities:

- **Grade 1**: The Moldovan business facilities´ average operating period is 10.6 years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The business facilities offer optimal access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R41. Boosting the promising start-ups through access to business centres.

Table 112. List of co-working spaces and business centres in Moldova

#	Name of co-working space or business centre	Founding year
1	Digital Park	2019
2	Sky Tower	2005
3	ZTower High-Tech Park and Business Centre	2014
4	Le Roi Business Centre	2010
5	Kentford	2003

Involvement of the public sector in the development of the ecosystem

The level of involvement of the public entities such as government, development agencies and international organisations / donors is key to the ecosystem's growth. Although these entities performance is not evaluated in this analysis, the authors summarise their involvement in the ICT entrepreneurial ecosystem's development in the sections below.

International organisations as ecosystem builders

According to the country-level assessment, international organisations are offering start-ups access to knowledge, market and resources:

1) The most notable international organisations involvement in offering **access to knowledge** in the idea and pre-seed stages was the support in the creation of the Centre of Excellence in Information and Communication Technologies "Tekwill", which offers different entrepreneurial and emerging technologies´ educational programmes for entrepreneurs.

The Tekwill was officially launched in 2017 with the support of the United States Agency for International Development (USAID) and the Government of Sweden through the Swedish International Development Agency (SIDA), in the framework of the project "Development of Moldova ICT Excellence Centre", implemented by Moldovan Association of ICT Companies (ATIC) in partnership with the Technical University of Moldova. The programme was launched with a total funding amount of €3,3 million. In August 2019, the programme received a funding extension in the volume of €4 million. Located in the heart of the Technical University of Moldova (UTM), Tekwill is a 4,000m² hub with everything a start-up would ever need for ongoing growth, from co-working spaces and tech labs (e.g. IoT, 3D printing) to community events.

2) The most notable international organisations' involvement in offering **access to markets** for the last three years was through Moldova Competitiveness Project (MCP) (2015-2020), financed by USAID, the Government of Sweden and UK Aid.

   The programme promotes a healthy, diverse, and export-oriented economy by improving competitiveness and efficiency in critical Moldovan industries. The project has three components, including information and communications technology (ICT) clustered with creative services and precision engineering industries. The projects assist the companies that intend to export their products and services in market research and business strategy, providing related training and workshops, equipment, and guidance to expand the business into new locations. The project's goals are to promote market links for the Moldovan brands and enhance the collaboration with the private sector.

   In addition to MCP, it is also worthy to highlight that the Tekwill centre is very active in organising various events for start-ups, including networking events and hackathons.

3) Two international donors backed programmes offer **access to resources** to the Moldovan start-ups for the last three years.

   USAID supports the development of the ICT sector in Moldova since 2005. It expanded its scope over the years, put Moldova on the map of IT destinations, collaborated with IDC, and laid the foundation for Tekwill project. Recently, both MCP and Tekwill are also supporting smaller initiatives and ecosystem players, such as Dreamups Innovation Campus, Generator hub, iHub, and others.

   A regional Centre for Innovation and Technology Transfer is already under construction, on the Balti University premises, as a public-private partnership between the Government of Moldova, USAID, Sweden, UK aid and Balti Free Economic Zone.

   EU4MOLDOVA Start-up City Cahul, a €7 million project (2020-2023), currently in the launch phase, will support inclusive economic development by increasing the potential of the digital economy and enhancing regional competitiveness and its business and investment environment by supporting the creation of a Regional Innovation and Technology Centre, the National Moldovan Science, Technology, Engineering and Math (STEM) promotion campaign and development programmes, and developing a seed funding and acceleration programme for ICT related start-ups.

Government as an ecosystem builder

According to the country-level assessment, there is no specific government-backed funding programme fully dedicated to the ICT sector. The existing programmes are mainly designed for supporting multi-sectorial businesses (including IT) target groups, like rural entrepreneurship or underserved groups.

The authorities support the country's first dedicated programme for IT entrepreneurship, Start-up Moldova, launched in May 2020 by Tekwill. It offers support in the digitalisation of SMEs, education, infrastructure, consulting, mentoring, access to events and funding opportunities.

As per conducted interviews with stakeholders of the countries' ecosystem, the government is now at the consultation stage of establishing a Digital Innovation and Technology Start-ups Support Fund in 2021, which will give grants to small and medium IT companies. The state budget will dedicate 5 million (€ 240,000) for start-up grants, and additional funding is expected through partners.

Since the "IT Strategy Digital Moldova 2020" already ended, a new one is being developed at the moment, while the "Strategy for the Development of the Information Technology Industry and the Ecosystem for Digital Innovation for the Years 2018-2023" is still in force. The latter is used as a basis for further improvements in the ecosystem and regulative setting and sets specific objectives for increasing the number of companies that apply digital innovations to streamline business processes and simplify business administration and create acceleration funds

and investments in ICT-based innovations[78]. It also aims to create alternative mechanisms for fundraising and financing projects to develop ICT-based innovations and businesses.

Government as a regulator

According to the country-level assessment, taxation is advantageous for ICT companies with a special tax of 7% from the turnover. It is replacing the corporate income tax (CIT), the personal income tax (PIT), social security and medical insurance taxes, and local and real estate taxes. Other types of income (e.g., financial or exceptional income) are considered taxed by applying the single tax[79]. The Law on Information Technology (IT) Parks boosted the IT sector in just a couple of years. Expanding the type of activities, eligible for membership in Moldova IT Park, also helped increase the number of beneficiaries. The main benefit for companies registered as residents of IT parks (such as IT service companies and tech start-ups) is the simplification and reducing taxation.

The new law on alternative collective investment undertakings (crowd-funding) is expected to stimulate venture financing in innovative IT companies[80].

Within a "Strategy for the development of the information technology industry and the ecosystem for digital innovation for the years 2018-2023"[81] legislative adjustment is planned in the area of intellectual property rights, namely, adjustment of copyright and related rights legislation following the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization. There is also a Code on Science and Innovation and The Law on copyright and related rights.

The State Agency on Intellectual Property (AGEPI), an authority subordinated to the government, is responsible for promoting and implementing activities in legal protection of intellectual property related to industrial property rights, copyright and related right.

During an interview, a government representative mentioned that the government attracts foreign tech and managerial talent, providing simplified visa procedure (IT Visa), working and living permits. From 2018 to now 42 professionals received Manager Visa, and 80 received an IT Specialist Visa, to work in companies, residing in Moldova IT Park.

[78] Order of the Government of the Republic of Moldova: https://mei.gov.md/sites/default/files/strategie_aprobata_hg_904_24.09.2018.pdf.
[79] Moldova Invest, ICT & BPO Sector Overview - Republic of Moldova, 2019: https://moldovaitpark.md/wp-content/uploads/2019/09/2019_ICT_and_BPO_overview_Brochure.pdf.
[80] EU4Digital Facility study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".
[81] Strategy for the development of the information technology industry and the ecosystem for digital innovation for the years 2018-2023: https://eufordigital.eu/library/moldova-strategy-for-the-development-of-the-information-technology-industry-and-the-ecosystem-for-digital-innovation-for-the-years-2018-2023/.

8.3. Recommendations by priority in Moldova

Below the experts list the **high and medium priority** recommendations necessary to empower the ICT entrepreneurial ecosystem of Moldova.

Also, the detailed list of all main recommendations for capacity builders acting in the six Eastern Partnership countries can be found in Chapter 11.

Table 113. Priority recommendations for empowering the Moldovan ICT entrepreneurial ecosystem

Recommendation	Priority	Area	Stage
R1. Creating universities´ entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R2. Empowering universities by implementing specialised entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R6. Boosting technology education centres by implementing educational specialisation in emerging technologies	HIGH	KNOWLEDGE	IDEA
R7. Boosting technology education centres by funding capacity for R&D development	HIGH	KNOWLEDGE	IDEA
R8. Creating incubators	HIGH	KNOWLEDGE	PRE-SEED
R11. Creating accelerators	HIGH	KNOWLEDGE	SEED
R12. Empowering accelerators by implementing specialised pre-acceleration programmes	MEDIUM	KNOWLEDGE	SEED
R15. Attracting international accelerators to the local ecosystem	HIGH	KNOWLEDGE	SEED
R16. Creating mentorship associations	HIGH	KNOWLEDGE	EARLY
R17. Boosting mentorship associations by implementing access to service providers´ funding capacity	MEDIUM	KNOWLEDGE	EARLY
R18. Empowering specialised incubation by focusing on digitalisation of the local industry	HIGH	KNOWLEDGE	EARLY
R20. Creating venture capital firms	HIGH	CAPITAL	EARLY
R22. Attracting international venture capital firms to the local ecosystem	HIGH	CAPITAL	EARLY
R23. Creating business angels networks	HIGH	CAPITAL	SEED
R24. Empowering business angels networks by strengthening the investment expertise	MEDIUM	CAPITAL	SEED

Recommendation	Priority	Area	Stage
R26. Creating crowdfunding platforms	HIGH	CAPITAL	PRE-SEED
R29. Empowering talent generation events through sponsorship	MEDIUM	MARKET	IDEA
R31. Empowering entrepreneurial events through sponsorship	HIGH	MARKET	PRE-SEED
R32. Boosting entrepreneurial events through internationalisation	MEDIUM	MARKET	PRE-SEED
R33. Creating ICT ecosystem databases	HIGH	MARKET	SEED
R35. Empowering investments forums through sponsorship	HIGH	MARKET	SEED
R36. Boosting investments forums through internationalisation	MEDIUM	MARKET	SEED
R37. Empowering business forums by connecting private sector with ICT ecosystem	MEDIUM	MARKET	EARLY
R38. Boosting the promising start-ups through access to international trade fairs	HIGH	MARKET	EARLY
R40. Empowering tech facilities through technology clustering	MEDIUM	RESOURCES	IDEA
R41. Boosting the promising start-ups through access to business centres	HIGH	RESOURCES	EARLY
R42. Creating tech parks in small urban areas	HIGH	RESOURCES	IDEA

Chapter 9: UKRAINE

This diagnosis of the performance of the ICT entrepreneurial ecosystem stakeholders in Ukraine is structured in the following manner:

1. Current status of ICT entrepreneurial ecosystem performance through comparison of the conversion ratios of ICT start-ups in different growth stages with select European and other countries.
2. Diagnosis of the performance of the different ecosystem stakeholders: educators, investors, connectors and facilitators by evaluating 19 indicators *(see Chapter 3).*
3. Prioritisation of the main recommendations for further developing the ICT entrepreneurial ecosystem in Ukraine.

The detailed methodology of the diagnosis is provided in Chapter 1.

9.1 Status of the ICT entrepreneurial ecosystem in Ukraine

This subchapter provides information on:

1. Start-ups strength, by providing the comparison of the start-ups conversion ratios from the idea stage to the early stage with select European and other more mature ecosystems.
2. Ecosystems stakeholders status in the different stages of the start-ups lifecycle.

To analyse the maturity of the ICT entrepreneurial ecosystem in Ukraine, first the strength of the start-ups according to the conversion ratios from the idea stage to the early stage, was compared with the ratios of the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania). These countries have been selected due to relevant similarities with the Eastern partner countries such as ICT ecosystem size, targeted IT industries and their size, historical and cultural development path. In addition, the experts have compared the conversion ratios of the Ukraine start-ups with well-developed ecosystems of four selected Western European countries (Germany, France, United Kingdom and Spain), as well as with more mature ecosystems like California (Silicon Valley) and Israel *(see tables below).*

The conversion ratios have been calculated based on the information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries" and the largest ICT entrepreneurial databases Dealroom and CrunchBase. The latter sources provide information on a large number of start-ups and investment rounds to calculate the conversion ratios that are close to reality. However, the reader should bear in mind that the mentioned sources do not provide comprehensive data on all start-ups operating in the compared countries, especially in the idea and pre-seed stages, where start-ups have not yet received investments. Also, these sources do not collect the information on start-ups in the early to scale-up stage that have grown without the need for external investments. Nevertheless, these estimated ratios include a significant sample of companies, allowing to make an assumption about the actual conversion ratios of the start-ups in the country.

The experts have compared the conversion ratios of the Ukrainian start-ups and other selected countries and the differences are provided in the tables below.

Table 114. Conversion ratios compared with the selected East-Central European countries

#	Country	Ratio idea to pre-Seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**EAST-CENTRALEUROPE AVERAGE**	**0,06%**	**12,54%**	**4,24%**	**0,64%**	**0,19%**
1.1	**LITHUANIA**	0,11%	14,23%	4,84%	0,79%	0,30%
1.2	**ESTONIA**	0,06%	12,49%	4,96%	0,53%	0,14%
1.3	**POLAND**	0,04%	11,91%	3,21%	1,25%	0,27%
1.4	**BULGARIA**	0,05%	12,26%	4,56%	0,28%	0,11%
1.5	**ROMANIA**	0,04%	11,79%	3,64%	0,36%	0,14%
2	**UKRAINE**	**0,05%**	**8,20%**	**2,15%**	**0,29%**	**0,06%**
2-1	**DIFFERENCE**	**-22,88%**	**-34,59%**	**-49,21%**	**-54,28%**	**-69,98%**

Table 115. Conversion ratios compared with the selected Western European countries

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**WESTERN EUROPE AVERAGE**	**0,11%**	**15,94%**	**4,66%**	**1,47%**	**0,59%**
1.1	**GERMANY**	0,06%	16,60%	5,13%	2,09%	0,79%
1.2	**FRANCE**	0,06%	15,92%	4,87%	1,93%	0,67%
1.3	**UNITED KINGDOM**	0,21%	16,23%	5,32%	1,27%	0,63%
1.4	**SPAIN**	0,10%	15,01%	3,31%	0,58%	0,27%
2	**UKRAINE**	**0,05%**	**8,20%**	**2,15%**	**0,29%**	**0,06%**
2-1	**DIFFERENCE**	**-58,29%**	**-48,56%**	**-53,73%**	**-80,12%**	**-90,25%**

Table 116. Conversion ratios compared with California and Israel

#	Country	Ratio idea to pre-seed	Ratio pre-seed to seed	Ratio seed to early	Ratio early to scale-up	Ratio exits
1	**CALIFORNIA**	0,73%	22,23%	4,89%	2,43%	0,68%
2	**ISRAEL**	0,26%	23,21%	6,11%	3,66%	0,72%
3	**UKRAINE**	**0,05%**	**8,20%**	**2,15%**	**0,29%**	**0,06%**
3-(1+2)	**DIFFERENCE**	**-95,35%**	**-81,95%**	**-80,41%**	**-95,20%**	**-95,89%**

The comparison showed that the Ukrainian start-ups' conversion ratios are significantly lower in almost all stages than the selected East-Central and Western European countries, California and Israel ecosystems. Nevertheless, the conversion ratios differences are smaller in the idea stage to seed stage start-ups meaning that the Ukrainian ecosystem has the capacity to support talented entrepreneurs in generating start-ups.

The conversion ratios are impacted by the ecosystem stakeholders' involvement in start-ups' development and growth. The diagnosis below analyses the performance of those stakeholders that support start-ups' growth from the idea stage to the early stage. Once the start-up becomes a company with international perspectives or scale-

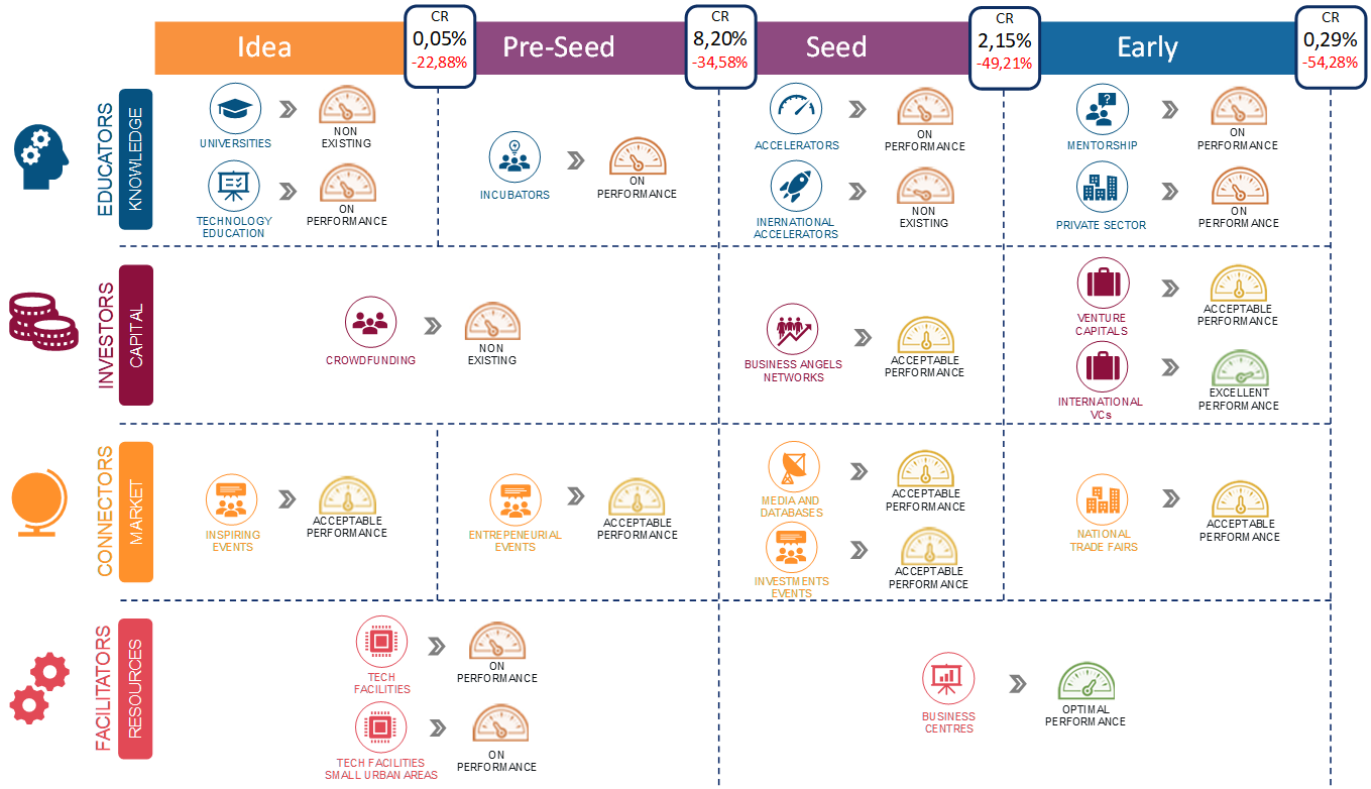
up, the local entrepreneurial ecosystem stakeholders' relevance is reduced, and start-up growth is ensured by its own resources.

The figure below presents the level of stakeholders' performance at each stage of the start-ups' growth. It was developed to offer the reader a clear view of the main strengths and weaknesses of the ICT entrepreneurial ecosystem in Ukraine. The figure provides information on:

1. The conversion ratios (CR) of Ukraine ecosystem start-ups from idea to early stage.
2. The difference in the Ukrainian start-ups' conversion ratios compared with the five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania) from idea to early stage.
3. The ecosystem status by stakeholder type (from educators to facilitators) and start-up growth stage (from the idea stage to the early stage).

The majority of the stakeholders are involved in several stages of the start-up lifecycle, but in the figure, they are assigned only to the stages their involvement is the most active.

Figure 17. Ukrainian ICT entrepreneurial ecosystem performance status (CR – conversion ratio)



The performance of the stakeholders at each growth stage of the start-ups are evaluated below.

Idea stage: 0.05% Conversion ratio from the idea stage to pre-seed stage

The conversion ratio of the Ukrainian individuals having a business idea to entrepreneurs creating a start-up in a pre-seed stage is 0.05%; the ratio is 22.88% smaller compared to the 0.06% conversion ratio from selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the idea stage is provided in the table below.

Table 117. Stakeholders´ performance in the idea stage

#	Indicator	Performance	Explanation
1.	Indicator 1.1. The quality of universities´ entrepreneurial education programmes	*Non-existent*	There are no universities' entrepreneurial educational programmes in the country´s ICT entrepreneurial ecosystem offering access to knowledge to talented individuals.
2.	Indicator 1.2. The quality of high-technology education centres giving access to specialisation in emerging technologies	*On performance*	The technology education entities offer limited access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 6.1. The existence of talent generation events	*Acceptable performance*	The talent generation events offer adequate access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 9.1. The quality of the tech facilities to support the start-up creation	*On performance*	The tech facilities offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 9.2. The existence of the tech facilities to support the start-up creation in small urban and rural areas	*On performance*	The tech facilities in small urban and rural areas offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Pre-seed stage: 8.20% Conversion ratio from the pre-seed stage to seed stage

The conversion ratio of the Ukrainian start-ups from the pre-seed stage to the seed stage is 8.20%; the ratio is 34.59% smaller compared to the 12.54% conversion ratio from selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the pre-seed is provided in the table below.

Table 118. Stakeholders´ performance in the pre-seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.1. The quality of the incubators	*On performance*	The incubators offer limited access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 4.1. The existence of crowdfunding platforms in the country	*Non-existent*	There are no crowdfunding platforms in the country´s ICT entrepreneurial ecosystem offering access to capital to start-ups from the idea stage to the early stage.
3.	Indicator 7.1. The quality of the entrepreneurial events	*Acceptable performance*	The entrepreneurial events offer adequate access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Seed stage: 2.15% Conversion ratio from the seed stage to early stage

The conversion ratio of the Ukrainian start-ups from the seed stage to the early stage is 2.15%; the ratio is 49.21% smaller compared to the 4.24% conversion ratio from selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the seed stage is provided in the table below.

Table 119. Stakeholders´ performance in the seed stage

#	Indicator	Performance	Explanation
1.	Indicator 2.2. The quality of the accelerators	*On performance*	The accelerators offer limited access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 2.3. The existence of international accelerators operating in the country	*Non-existent*	There are no international accelerators in the country´s ICT entrepreneurial ecosystem offering access to knowledge to start-ups from the pre-seed stage to the seed stage.
3.	Indicator 5.3. The existence of business angels networks	*Acceptable performance*	The business angels networks offer adequate access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem	*Acceptable performance*	The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.1. The existence of investment forums	*Acceptable performance*	The investment forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Early stage: 0.29% Conversion ratio from the early stage to scale-up

The conversion ratio of the Ukrainian start-ups from the early stage to scale-up is 0.29%; the ratio is 54.28% smaller compared to the 0.64% conversion ratio from selected East-Central European countries. The status of the related stakeholders' performance that are supporting start-ups at the early stage is provided in the table below.

Table 120. Stakeholders´ performance in the early stage

#	Indicator	Performance	Explanation
1.	Indicator 3.1. The existence of mentorship associations	*On performance*	The mentorship associations offer limited access to knowledge to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
2.	Indicator 3.2. The existence of the private sector´s entrepreneurial programmes	*On performance*	The private sector´s entrepreneurial programmes offer limited access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
3.	Indicator 5.1. The quality of the local venture capital firms	*Acceptable performance*	The venture capital firms offer adequate access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
4.	Indicator 5.2. The existence of international venture capital firms operating in the country	*Excellent performance*	The international venture capital firms offer excellent access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
5.	Indicator 8.2. The existence of national trade fairs and business forums	*Acceptable performance*	The national trade fairs and business forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
6.	Indicator 10.1. The existence of the business facilities to support the start-up development	*Optimal performance*	The business facilities offer optimal access to resources to start-ups from the seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

9.2. Diagnosis of the maturity of the ICT entrepreneurial ecosystem in Ukraine

The diagnosis below evaluates the performance of the ICT entrepreneurial ecosystem´s stakeholders in Ukraine, such as educators, investors, connectors and facilitators. The evaluation is based on an analysis of 19 indicators graded from 0 to 4 (*see Annex 1: Indicator´s evaluation criteria*). Following that, the conclusions on current performance and recommendations for improvement are provided, excluding evaluation of the regulators / public sector performance (*for more explanations see the methodology in Chapter 1*).

KPI 1. Performance of the educators in talent generation

Indicator 1.1. The quality of universities´ entrepreneurial education programmes[82].

According to the country-level assessment, two universities in Ukraine offer entrepreneurship courses (*see table below)*.

- The Lviv Business School offers a Master of Science in Innovation and Entrepreneurship Programme.
- The Ukrainian-American Concordia University offers a dual masters programme in Information Management with a Major in Entrepreneurship, Technology and Innovation.

As of April 2020, 117 start-ups have been launched by active and former students of Ukrainian universities[83].

Criteria: The percentage of universities that are offering entrepreneurial education programmes:

- **Grade 1**: The percentage of universities offering entrepreneurial education programmes in Ukraine is 0.70% (two out of 281 universities), which is 77.30% less compared to the selected East-Central European countries.

Evaluation of the indicator:

- **Non-existent**: It should be considered as non-existent due to the very low number of entrepreneurial educational programmes offered to talented individuals by universities in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R1. Creating universities´ entrepreneurial programmes.
- **Low priority**: R2. Empowering universities´ entrepreneurial programmes.
- **Low priority**: R3. Boosting universities´ by implementing high entrepreneurial education.

Table 121. List of universities offering entrepreneurial education programmes in Ukraine

#	Name of university offering entrepreneurial education programmes
1	Lviv Business School
2	Ukrainian-American Concordia University

Indicator 1.2. The quality of technology education centres giving access to educational specialisation in emerging technologies.

According to the country-level assessment, Ukraine has several high-tech education centres (*see table below).* Some Ukraine IT companies have their own IT educational courses, programmes, or schools. Examples are BeetRoot Academy, SoftServe IT Academy, EPAM University Programme, Sigma Software University, Global Logic Education, among others. Some IT companies also cooperate with universities to help them prepare high-skilled professionals that meet the IT labour market requirements.

[82] Indicator 1.1 consider entrepreneurial education programmes as per standard curricula of universities.
[83] Dealroom data: https://dealroom.co/.

The private schools in Ukraine are Step Academy, Web Academy, CyberBionic Systematics, Source IT, Lviv IT School, DataRoot University, Hillel IT School, Main Academy, IT Education Academy (ITEA), GoIT, Prog Kiev.UAa among others[84].

More than 150 R&D centres of large tech international companies are located in Ukraine, mostly in Kyiv. As the city with the most mature tech ecosystem, Kyiv is the hub for the R&Ds of Snap, Boeing, Benish Group, Ring, Huawei, Upwork, Aricent, etc. Dnipro city became the place for R&D centres of Magento, Playtika, Sitecore, etc. A large number of R&D centres are located in Odessa. Among them are Netracker, Siemens, Comodo, etc.

There are currently 34 science parks[85] and 16 tech parks in Ukraine, many of which are in the universities. Nevertheless, due to decreasing funding for R&D, the research infrastructure has been declining over the last century, and the existing one needs modernisation[86].

Criteria: The estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants:

- **Grade 1:** The number of technology education entities per million inhabitants in Ukraine is six, out of a total number of tech educational facilities of 220. That is 19.40 less centres compared to 24.4 centres in the selected East-Central European countries.

Evaluation of the indicator:

- **On performance**: The technology education entities offer limited access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R4. Creating technology education centres.
- **Medium priority**: R5. Empowering technology education centres by implementing educational specialisation in emerging technologies.
- **Low priority**: R6. Boosting technology education centres by implementing educational specialisation in emerging technologies.
- **Low priority**: R7. Boosting technology education centres by funding capacity for technology development.

Table 122. List of technology education centres in Ukraine

#	Name of technology education centre	Number of centres
1	Step Academy	1 centre
2	Web Academy	1 centre
3	CyberBionic Systematics	1 centre
4	Sigma Software University	1 centre
5	Lviv IT School	1 centre
6	DataRoot Labs	1 centre

[84] Information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".
[85] List of science parks in Ukraine: https://mon.gov.ua/ua/nauka/innovacijna-diyalnist-ta-transfer-tehnologij/naukovi-parki.
[86] More information about R&D infrastructure quality: http://documents1.worldbank.org/curated/en/126971509628933853/pdf/2-11-2017-14-55-6-UkraineInnovationandEntrepreneurshipEcosystemDiagnostic.pdf.

KPI 2. Performance of the educators from the idea to the pre-seed stage

Indicator 2.1. The quality of the incubators.

According to the country-level assessment, ten active incubators in Ukraine offer incubation programmes in universities and private facilities (*see also table below)*:

- The Sikorsky Challenge Innovative Ecosystem at National Technical University Igor Sikorsky Kyiv Polytechnic Institute offers a business incubator for its students.
- The Lviv-based Centre for Entrepreneurship of the Ukrainian Catholic University (UCU) has pre-acceleration programmes that help internal and external participant-teams validate their ideas and prototypes. It also has a social entrepreneurship pre-accelerator and organises several hackathons, boot-camps, meet-ups for start-ups and events in the "venture cafe" format to connect players in the Ukrainian ecosystem, in addition to cooperating with some international accelerators.
- YEP is a network of academic business-incubators that provide a business-related education for youth, contributing to the development of the entrepreneurial ecosystem of Ukraine. They offer a three-month incubation, pre-acceleration and acceleration programmes.
- SPARK is an innovation and entrepreneurship centre at Kharkiv Polytechnic Institute. It aims to support students and young scientists in commercialising their ideas. Activities include start-up school, Innovation Bootcamp pre-incubation programme, mentoring, coaching, expert support, consulting, training, seminars, master classes, business games, co-working, and event space.
- The Tech Start-up School opened in October 2017 and is a part of Lviv Polytechnic National University. The Tech Start-up School's mission is to create a comfortable innovation environment for the production and implementation of creative ideas and successful start-ups. Their projects include the Start-up Breakthrough training programme, Creative Spark educational programme, the crowdfunding platform Startera, the Asolation Hub and Tech Labinno.
- The Innovation Centre of Kyiv Academic University (IC KAU) develops entrepreneurship among students and scientists of the National Academy of Sciences of Ukraine. Since 2019, IC KAU provides innovation services (consulting, expertise, education and information, and technical brokerage) in the commercialisation of tech innovations, solves scientific and technological problems with the involvement and assistance of leading scientific institutions of the National Academy of Sciences of Ukraine.
- Politeco is the business incubator of the National Technical University of Ukraine "Kyiv Polytechnic Institute". The incubator helps launch and commercialise innovative students and postgraduates' innovative ideas from the University.
- The Business Incubator Group Ukraine provides access to free consulting services to entrepreneurs through industry experts and mentors, as well as access to funding for developing their start-ups.
- 1991 Open Data Incubator is a programme focused on infrastructure, agricultural and energy projects that work with governments and businesses. They aim to develop an open data ecosystem and empower digital decentralisation.
- Eō Business Incubators help projects that work with different topics and technologies. Some teams develop deep tech technologies. At its core is an intensive four-month curriculum designed to support technologists and entrepreneurs in launching and scaling their industry-changing technology businesses. Incubated businesses then join expert-led sessions covering all the fundamentals, from ideation to fundraising, with real-world mentorship by Ukrainian and global entrepreneurs and investors.

Criteria: The estimated number of incubators per million inhabitants:

- **Grade 1**: The number of incubators per million inhabitants in Ukraine is 0.2 from a total number of ten incubators; 2.2 less incubators compared to 2.04 incubators per million inhabitants from the selected East-Central European countries.

Criteria: The average operating period of the country's active incubators:

- **Grade 4**: The Ukrainian incubators' average operating period is 4.5 years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The incubators offer limited access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R8. Creating incubators.
- **Medium priority**: R9. Empowering Incubators by implementing specialised incubation programmes.
- **Low priority**: R10. Boosting Incubators by implementing "idea-stage" grant schemes.

Table 123. List of incubators in Ukraine

#	Name of incubator	Founding year
1	The Centre for Entrepreneurship of the Ukrainian Catholic University	2018
2	Business Incubator Group Ukraine	2017
3	1991 Open Data Incubator	2016
4	Innovation Centre of Kyiv Academic University	2017
5	YEP	2017
6	Kharkiv Polytechnic Institute SPARK	2020
7	Tech Start-up School	2017
8	Sikorsky Challenge Innovative Ecosystem	2013
9	Polyteco	2011
10	eō Business Incubators	2019

Indicator 2.2. The quality of the accelerators.

According to the country-level assessment, several accelerators offer pre-acceleration and acceleration programmes in Ukraine (*see also table below)*:

- The GrowthUP business-accelerator is a part of the GrowthUP Group. It is considered the first accelerator in Ukraine focused on technology-based projects. They provide complex support and advisory services for start-ups, access to investments, and expansion for European and US markets.
- The iHub accelerator provides access to international mentors and financing opportunities through international networking and Seed Forum conferences. It holds trainings, workshops, masterclasses, meet-ups, competitions, hackathons and conferences for start-ups.
- The Carrot start-up accelerator provides new product development service for start-up teams or companies, proposes further engineering, accompanying technical and industrial help in the organisation of the investment attraction campaign.
- From 2018, the Ukrsibbank BNP Paribas launched a fintech accelerator together with the Radar Tech called PopCorn. The bank previously held start-up battles. The accelerator graduates have received $300,000 of investments and 30% are generating sales.
- Sector X is an acceleration programme based in the Unit.City hub that assists in fundraising, market-entry, mentorship and facilities for start-ups.

Other accelerators are the Blue Lake Accelerator, IoT Hub Accelerator and Indax Accelerator.

Criteria: The estimated number of accelerators per million inhabitants:

- **Grade 1**: The number of accelerators per million inhabitants in Ukraine is 0.20 from a total number of eight accelerators; 1.03 less accelerators compared to 1.22 accelerators per million inhabitants from the selected East-Central European countries.

Criteria: The average operating period of the country's active accelerators:

- **Grade 4**: The Ukrainian accelerators´ average operating period is five years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The accelerators offer limited access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority**: R11. Creating accelerators.
- **Medium priority**: R12. Empowering accelerators by implementing specialised pre-acceleration programmes.
- **Low priority**: R13. Boosting accelerators by implementing seed-stage grant schemes.
- **Low priority**: R14. Boosting accelerators through access to local and international markets.

Table 124. List of accelerators in Ukraine

#	Name of accelerator	Founding year
1	PopCorn	2018
2	Sector X	2018
3	Indax Accelerator	2019
4	Blue Lake Accelerator	2019
5	IoT Hub Accelerator	2015
6	GrowthUP	2010
7	Carrot	2014
8	iHub	2014

Indicator 2.3. The existence of international accelerators operating in the country.

According to the country-level assessment, even though the Ukrainian start-ups have increasing popularity in the international start-up scene, there is no international accelerator present in the country.

Criteria: The existence of international accelerators operating in the country:

- **Grade 0**: No international accelerators are operating in the Ukrainian ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no international accelerators in the country´s ICT entrepreneurial ecosystem, offering access to knowledge to start-ups from the pre-seed stage to the seed stage.

Recommendations:

- **High priority**: R15. Attracting international accelerators to the local ecosystem.

KPI 3. Performance of the educators in the seed stage

Indicator 3.1. The existence of mentorship associations.

According to the country-level assessment, the entrepreneurs meet industry mentors during entrepreneurial events and acceleration programmes. An open innovation platform, Reactor, enables collaboration between companies and mentors for developing technology partnerships. They have brought together around 500 companies with 50 mentors and industry experts.

Criteria: The existence of mentorship associations operating in the country:

- **Grade 3**: One mentorship association is operating in the Ukrainian ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The mentorship associations offer limited access to knowledge to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority**: R16. Creating mentorship associations.
- **High priority**: R17. Boosting mentorship associations by implementing access to service providers´ funding capacity.

Table 125. List of mentorship associations in Ukraine

#	Name of mentorship association	Founding year
1	Reactor	2016

Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

According to the country-level assessment, several IT and software development companies provide access to knowledge to start-ups. For example, Intecracy Group provides start-ups with mentoring, consulting, business strategy development and software development. In addition, the Intecracy Group has an “INTECRATOR” programme that was created with the support of Ernst & Young, Ukraine. It is a high-tech start-up programme, designed according to the Venture Builder model. The programme is also aimed at allowing the most successful start-ups to get the opportunity to work with the largest corporate players that are leaders in their respective industries.

The public organisation “Platform of Innovation Partnership” with Cisco’s support announced the launch of a network of business incubators in four universities in Kyiv and Donetsk called YEP.

Criteria: The existence of the private sector´s entrepreneurial programmes operating in the country:

- **Grade 3**: Two private sector entrepreneurial programmes are operating in the Ukrainian ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The private sector´s entrepreneurial programmes offer limited access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R18. Empowering specialised incubation by focusing on digitalisation of the local industry.

Table 126. List of private sector’s entrepreneurial programmes in Ukraine

#	Name of private sector’s entrepreneurial programme	Founding year
1	INTECRATOR by Intecracy Group	2019
2	YEP by Platform of Innovation Partnership	2017

KPI 4. Performance of the investors from the idea to the pre-seed stage

Indicator 4.1. The existence of crowdfunding platforms in the country.

According to the country-level assessment, no IT specialised crowdfunding platform in Ukraine is intended for start-ups and businesses to raise capital.

Domestic platforms were established as early as 2011, including the Ukrainian Philanthropic Marketplace and Spilnokosht, which provided new opportunities for civil society initiatives, social entrepreneurship, and people who need to reach out to Ukrainian audiences.

Criteria: The existence of crowdfunding platforms operating in the country:

- **Grade 0**: No crowdfunding platforms are operating in the Ukrainian ICT ecosystem.

Evaluation of the indicator:

- **Non-existent**: There are no crowdfunding platforms in the country´s ICT entrepreneurial ecosystem offer access to capital to start-ups from the idea stage to the early stage.

Recommendations:

- **High priority:** R26. Creating crowdfunding platforms.
- **Low priority:** R27. Empowering crowdfunding platforms through access to a critical mass of investors.

KPI 5. Performance of the investors from the seed to the early stage

Indicator 5.1. The quality of the local venture capital firms.

According to the country-level assessment, and the Market Assessment for Digital Innovation and Scale-up Initiative in the Eastern partner countries, Ukraine has an official venture capital association (UVCA) and local VC funds. Those funds invest in seed and Series A rounds regularly. Some of those funds operate as family offices, others follow a standard VC/PE model. 13 venture capital firms[87] and two private equity funds are locally active. There were 111 investment deals in 2019 and 115 investment deals in 2018.

According to the public data sources CrunchBase and Dealroom, 2019 was marked by 29 exits of Ukrainian investors. As per the AVentures report for 2020, the share of local investors in real deals is still less than half, but has increased compared to 2018. However, at the Series A+ stages, only 2% of funding came from Ukraine.

Among the most active funds on the Ukrainian, start-up scene are the following ones (*see also table below):*

- Acrobator Ventures: A fund co-founded by Bas Godska, a Dutch businessman living in Kyiv and probably the most prolific foreign business angels and mentor across the former Soviet Union (Ukraine, Russia, Kazakhstan). This fund plans to invest up to €20 million in the coming three years 'from the pre-seed stage to later stages,' partly in these countries. Acrobator's sweet spots are SaaS, Big Data/ML/AI and HR tech, not excluding other segments.
- AVentures Capital: This fund of $20 million of invests from $0,5 million (late seed stage) to $5 million (growth stage). It targets Ukrainian start-ups (e.g. Augmented Pixels, Bookimed, NuPsys, Petcube, Spinbackup, Viseven) as well as IT outsourcing companies (e.g. Ciklum).
- Digital Future: A prolific Ukraine-born VC firm that invests at the seed and early-stage (rarely at the pre-seed stage) from $50,000 to $0,5 million. Its sweet spots are AdTech, AI, security, IoT, SaaS, marketplaces, B2B, B2C. The fund occasionally invests internationally.
- TA Ventures: Headed by Viktoriya Tigipko, this fund has invested very actively outside Ukraine, from Europe to the USA, to emerging markets.

[87] The list of venture capital firms in Ukraine: OTB Ventures, Vostok Ventures, Genesis Investments, Imperious Group VC, TA Ventures, Chernovetskyi Investment Group, SMRK VC, u.ventures, Digital Future, ICU, Dragon Capital, Western NIS Enterprise Fund, Horizon Capital, AVentures.

- U.ventures*:* Launched in 2017, this Seed and Series A fund is tech agnostic. It was launched in 2017 by USAID-backed WNISEF, a $150 million facility covering Ukraine and Moldova.

Criteria: The number of venture capital firms per million inhabitants:

- **Grade 1**: The number of venture capital firms per million inhabitants in Ukraine is 0.3 from a total estimated number of 13 venture capital firms; 1.43 less compared to 1.73 VC firms per million inhabitants from the selected East-Central European countries.

Criteria: The average number of investments per local venture capital firms from 2017 to 2020:

- **Grade 3**: The average number of investments per local VC firms in Ukraine from 2017 to 2020 is 6.5 from a total 71 investments; 0.43 more compared to the average of 6.07 number of investments from the selected East-Central European countries.

Criteria: The average operating period of the country's active venture capital firms:

- **Grade 4**: The Ukrainian venture capital firms´ average operating period is nine years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The venture capital firms offer adequate access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R20. Creating venture capital firms.
- **High priority:** R19. Empowering venture capital firms through fund of funds programmes.
- **Medium priority:** R21. Boosting venture capital firms through access to international markets.

Table 127. List of local venture capital firms in Ukraine

#	Name of local venture capital firm	Founding year	Number of investments since 2017
1	Acrobator Ventures	2019	8
2	AVentures Capital	1999	10
3	Digital Future	2014	6
4	TA Ventures	2010	5
5	u.ventures	2017	7
6	Horizon Capital	2006	7
7	Western NIS Enterprise Fund	1995	6
8	Dragon Capital	2000	2
9	Investment Capital Ukraine	2006	Unknown
10	SMRK VC	2013	Unknown
11	Chernovetskyi Investment Group	2012	5
12	Vostok Ventures	2012	1
13	OTB Ventures	2017	14

Indicator 5.2. The existence of international venture capital firms operating in the country.

According to the country-level assessment and the Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries, dozens of international funds invest in Ukrainian-born companies. Among the locally active international funds are Y Combinator, Point Nine, bValue. They all provide seed to Series A capital. Such funds as Almaz Capital, TMT Investments, General Catalyst, Goldman Sachs, Andreessen Horowitz, ICONIQ and Sorors invest in Ukrainian companies at the Series A and later stages. In 2019, the share of foreign investments in the total investments for start-ups was 53% for the seed stage and 61% for Series A.

Apart from the venture capital firms with foreign funds (u.ventures, Western NIS Enterprise Fund), the locally created funds also invest in foreign start-ups and have offices abroad (e.g. TA Ventures, AVentures), thus syndicating with foreign funds and investors.

In 2019, for the first time, the total annual investment volume in Ukrainian start-ups and IT companies surpassed the half-billion mark. The total volume of venture investments in Ukrainian IT companies has reached $510 million, one-and-a-half times more than the maximum of 2018. Almost $470 million[88] (85%-90%) was invested by foreign investors, mostly from the US.

In early 2020, the private equity fund manager, Da Vinci Capital, agreed on €30 million contributions to its new fund, 'Da Vinci Capital Technology Fund III' as a contribution to its initial $100 million (€90 million) target. The fund will aim to participate mostly in Series B rounds across a broad range of segments. It will target particularly Ukraine, Belarus and Kazakhstan[89].

Criteria: The existence of international venture capital firms operating in the country:

- **Grade 3**: Three international venture capital firms are operating in the Ukrainian ICT ecosystem.

Conclusion of the indicator:

- **Excellent performance**: The international venture capital firms offer excellent access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R22. Attracting international venture capital firms to the local ecosystem.

Table 128. List of international venture capital firms in Ukraine

#	Name of international venture capital firm
1	Y Combinator
2	Point Nine
3	bValue

Indicator 5.3. The existence of business angels networks.

According to the country-level assessment, the Ukrainian angels association (UANGEL) was founded in 2014 to provide a platform for entrepreneurs to meet investors and for investors to join local and international syndicates. UANGEL is a member of the European Business Angels Network and a partner of GUST, the international collaboration platform for angels investing.

The Ukrainian business angels network currently has 37 members. It facilitates entrepreneurs' introduction to potential investors through pitching events, presentations, investors coffee mornings, among other tools. While a few angels invest up to $1 million, the majority invests $50,000 - $200,000. The iCLUB, managed by TA Ventures, allows angels to make small-ticket co-investments alongside the TA Ventures fund and benefit from their analysis, monitoring and exit of every investment.

[88] See UVCA Report 2019, also see: http://uvca.eu/en/news/investments-into-ukrainian-startups-in-2019-overview#:~:text=In%202019%2C%20the%20volume%20of,to%240.9M%20in%202018.
[89] Source: https://bit.ly/2Z4LGL4.

In 2019, the total volume of angels investments in Ukrainian companies reached $6.1 million across 21 angels investments, a seven-fold increase in total deal volume compared with 2018. The majority of deals in 2019 (30 out of 111 identified in total) were at the seed stage with an average ticket of $0.4 million. Simultaneously, the average ticket among Series A investments was $2.9 million.

Criteria: The number of business angels networks per million inhabitants:

- **Grade 3:** One business angels network is operating in the Ukrainian ICT ecosystem.

Criteria: The average number of investments per local business angels network from 2017 to 2020:

- **Grade 2**: The average number of investments per local business angels network in Ukraine from 2017 to 2020 is 10.5 from a total 21 investments; 7.7 smaller compared to the average number of 18.20 investments from the selected East-Central European countries.

Criteria: The average operating period of the country's active business angels networks:

- **Grade 4**: The average operating period of Ukrainian business angels networks´ is seven years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The business angels networks offer adequate access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R23. Creating business angels networks.
- **High priority:** R24. Empowering business angels networks by strengthening the investment expertise.
- **Medium priority:** R25. Boosting business angels networks through co-investment matching programmes.

Table 129. List of business angels networks in Ukraine

#	Name of business angels network	Founding year	Number of investments since 2017
1	UANGEL	2014	Unknown

KPI 6. Performance of the connectors in talent generation

Indicator 6.1. The existence of talent generation events[90].

According to the country-level assessment, the Ukrainian entrepreneurial ecosystem hosts several events that raise awareness of entrepreneurship and innovations, such as start-up weekends and thematic hackathons (*see also table below*):

- Start-up Bootcamp was made for early-stage start-ups and young entrepreneurs who are already running their businesses and need to develop their ideas and services. The fundamental goal was to provide them with hands-on training in high impact entrepreneurial skills to build scalable start-ups that solve real problems.
- AI Ukraine is an annual conference on AI and data science applications for technical specialists, researchers, managers, entrepreneurs and everyone interested in gaining technical knowledge and learning about new AI and Big Data trends, research and real-use cases.
- Kyiv Tech Hub is a large-scale international conference. The event's primary goal is to link Polish venture funds with the most prospective start-ups and scientific projects from the whole of Ukraine. The two-day hybrid event is full of meetings, networking and actionable insights.

[90] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Criteria: The existence of relevant talent generation events in the country:

- **Grade 3**: Three relevant talent generation events are operating in the Ukrainian ICT ecosystem.

Criteria: The average operating period of the country's active talent generation events:

- **Grade 4**: The average operating period of talent generation events is 4.3 years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The talent generation events offer adequate access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R28. Creating talent generation events.
- **High priority:** R29. Empowering talent generation events through sponsorship.

Table 130. List of talent generation events in Ukraine

#	Name of talent generation event	Founding year
1	Start-up Grind Kyiv	2014
2	Kyiv AI	2018
3	AI Ukraine	2014

KPI 7. Performance of the connectors from the idea to the pre-seed stage

Indicator 7.1. The quality of the entrepreneurial events[91].

According to the country-level assessment, there are several small to medium-sized entrepreneurial events (*see* According to the country-level assessment, there are several small to medium-sized entrepreneurial events (*see table below*). Some notable events are the IT Arena conference, Kyiv International Economic Forum, ITEM, Start-up World Cup Competition, National Start-up Competition, Festival of Innovation, etc. There are also a number of international forums and summits with foreign colleagues:

- The IT Arena conference is the largest in volume and inclusive in terms of topics that cover entrepreneurship, technology, business environment and product development.
- The Start-up World Cup Competition is one of the largest of its kind globally. It connects start-ups, investors and corporate representatives from around the world. Ukraine hosted the 2020 edition.
- iForum is one of the largest offline IT conferences in Ukraine. In 2019, the event brought together 12,000 attendees from all over Ukraine and other countries. The conference included seven main streams: Internet Business, Start-ups, Advertising and Promotion, Internet Technologies, Future (technology, business, education and society), Digital Fun, "Automate This".
- The Ukrainian Innovation Awards are the first Ukrainian digital awards for corporate and start-up innovators, investors and entrepreneurs who provide innovative solutions to help businesses from Ukraine and across the world grow through innovation.

Criteria: The number of entrepreneurial events per million inhabitants:

- **Grade 1**: The number of entrepreneurial events per million inhabitants in Ukraine is 0.2 from a total number of ten recurrent events; 1.32 less compared to 1.52 entrepreneurial events per million inhabitants in the selected East-Central European countries.

[91] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Criteria: The average estimated number of attendees per entrepreneurial event:

- **Grade 3**: The average number of attendees per entrepreneurial event in Ukraine is 2,300; over 100 compared to the 2,200 average number of attendees per entrepreneurial event in the selected East-Central European countries.

Criteria: The average operating period of the country's active entrepreneurial events:

- **Grade 3**: The average operating period of entrepreneurial events is four years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The entrepreneurial events offer adequate access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R30. Creating entrepreneurial events.
- **High priority:** R31. Empowering entrepreneurial events through sponsorship.
- **Medium priority:** R32. Boosting entrepreneurial events through internationalisation.

Table 131. List of entrepreneurial events in Ukraine

#	Name of entrepreneurial event	Founding year	Number of participants in 2019
1	IT Arena conference (online)	2014	4,076
2	ITEM	2018	800
3	iForum	2017	12,000
4	Start-up World Cup Competition	2020	50
5	National Start-up Competition	2020	Unknown
6	Festival of Innovation	2017	60
7	Sikorsky Challenge Festival	2012	300
8	Ukraine Innovation Awards	2020	Unknown
9	IT Jazz Festival	2018	150
10	Games Gathering	2014	Unknown

Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem.

According to the country-level assessment, very few digital platforms present aggregated data on IT and entrepreneurship in Ukraine (*see also table below*):

- The Start-up Network is a digital platform that guides Ukrainian start-up investment opportunities and news.
- 360 Tech Ecosystem Overview is an online platform for business information about IT-companies, people, investors and the whole tech ecosystem of Ukraine in general. The collected information includes the data on current IT-companies' development, founders, officers and managers, companies' classification by industries, investment and funding, mergers and acquisitions, breaking news and industry's trends. The platform is still in the development phase.
- Ukraine Digital News (UADN) is the first international information platform dedicated to the Ukrainian digital and IT industries. Its website provides news, market data, business analysis and updates pertaining to the e-commerce, IT services and other innovations in the country, as well as to the relevant investment activity and legal environment.

Criteria: The existence of specialised entrepreneurial media in the country:

- **Grade 3:** Three specialised entrepreneurial media are operating in the Ukrainian ICT ecosystem.

Criteria: The existence of relevant ICT entrepreneurial ecosystem databases:

- **Grade 0**: No ICT entrepreneurial ecosystem´s databases are operating in the Ukrainian ICT ecosystem.

Criteria: The average operating period of the country's active specialised entrepreneurial media and databases:

- **Grade 3**: The average operating period of Ukrainian specialised entrepreneurial media is three years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R33. Creating ICT ecosystem databases.

Table 132. List of specialised entrepreneurial media in Ukraine

#	Name of specialised entrepreneurial media	Founding year
1	Start-up Network	2015
2	360 Tech Ecosystem Overview	2020
3	Ukraine Digital News	2021

KPI 8. Performance of the connectors from the seed to the early stage

Indicator 8.1. The existence of investment forums[92].

According to the country-level assessment, the investment forums in Ukraine are organised both by the government and the private sector (*see table below*).

In 2020, the capital city, Kyiv, hosted an investment forum discussing the current challenges and opportunities for the world and Ukraine in particular, as well as how to expand the investment capacity of Kyiv.

Intax Group Ukraine is organising various events, including investment forums and expos on financial instruments, global trends and market opportunities.

The Ukrainian Wealth Management Forum, organised in Kyiv, encompasses investments and venture capital topics.

The Ukrainian Investment Forum is annual and the largest event by CFA Society Ukraine. Since 2010 it provides opportunities to analyse the latest developments in capital raising and networking with leaders of the investment market in Ukraine.

Criteria: The existence of investment forums in the country:

- **Grade 4:** Four investment forums are operating in the Ukrainian ICT ecosystem.

Criteria: The average operating period of the country's active investment forums:

- **Grade 4**: The average operating period of Ukrainian investment forums is five years as of the date of this report.

[92] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Evaluation of the indicator:

- **Acceptable performance**: The investment forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **Low priority:** R34. Creating investment forums.
- **High priority:** R35. Empowering investment forums through sponsorship.
- **Medium priority:** R36. Boosting investment forums through internationalisation.

Table 133. List of investment forums in Ukraine

#	Name of investment forum	Founding year
1	Investment Forum of Kyiv	2019
2	Intax Private Capital Investment Forum	2013
3	Ukrainian Wealth Management Forum	2019
4	Ukrainian Investment Forum	2010

Indicator 8.2. The existence of national trade fairs and business forums[93].

According to the country-level assessment, Ukraine is hosting dozens of trade fairs in various sectors, as well as business forums both on country level (such as the Norwegian-Ukrainian business forum, Ukraine-Turkey business forum, etc.) and on the industry level. Being at the intersection of Eastern Europe and Asia, the country also hosts international conferences and forums (*see table below*).

One of the most outstanding events is the Ukrainian Business Forum that aims at enhancing public-private dialogue, updating on the latest news and opportunities. The forum was established in 2017.

The Kyiv International Economic Forum is one of the largest international forums in Eastern Europe that brings together business representatives, government and society to discuss key economic issues and global trends. For entrepreneurs, it can be an excellent opportunity for networking and accessing to market.

Other relevant trade shows and expos are the International Hospitality Conference, Ukrainian Food Expo, Ukrainian Gaming Week, Electronics and Industrial Automation, International Medical Forum and Agricultural Exhibition.

Criteria: The existence of national trade fairs and business forums in the country:

- **Grade 3:** Nine national trade fairs and business forums are operating in the Ukrainian ICT ecosystem.

Criteria: The average operating period of the country's active national trade fairs and business forums:

- **Grade 4**: The average operating period of Ukrainian national trade fairs and business forums is ten years as of the date of this report.

Evaluation of the indicator:

- **Acceptable performance**: The national trade fairs and business forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R37. Empowering business forums by connecting private sector with ICT ecosystem.
- **Medium priority:** R38. Boosting the promising start-ups through access to international trade fairs.

[93] Note: The given indicator calculates events established only until 2020. The virtual ad-hoc events organised throughout the COVID-19 pandemic were not included, as these events are considered as testing of new formats.

Table 134. List of trade fairs and business forums in Ukraine

#	Name of trade fair or business forum	Founding year
1	Ukrainian Business Forum	2017
2	Kyiv International Economic Forum	2014
3	International Hospitality Conference	2020
4	Food Expo	2018
5	Ukrainian Gaming Week	2020
6	Electronics and Industrial Automation	2019
7	The Ukraine International Travel and Tourism Exhibition	1995
8	International Medical Forum	2012
9	AGRO	1987

KPI 9. Performance of the facilitators in the idea stage

Indicator 9.1. The quality of tech facilities to support the start-up creation.

According to the country-level assessment, there are 13 tech parks in Ukraine, six of which are based in Kyiv (*see table below*). The vast majority of tech parks were founded at the beginning of 2000. The ones that also offer some services and facilities to the start-ups are the Polyteco Science City, Kharkiv IT park, Lviv IT Cluster, Smart City Lviv, Smart City Kharkiv, Vuglemash, “Academia”, Kyiv Smart City, Yavoriv, Machine Building Technologies and “Institute for Single Crystals”.

An example of entrepreneurial hub is the Unit City, an innovation park that provides to its residents facilities, mentorship and networking opportunities, and hosts industry events. The incubation and acceleration programmes as well provide with facilities to the start-ups.

Criteria: The number of tech facilities per million inhabitants:

- **Grade 1**: The number of tech facilities per million inhabitants in Ukraine is 0.31 from a total of 13 tech facilities; 1.01 less compared to the 1.32 tech facilities per million inhabitants in the selected East-Central European countries.

Criteria: The average number of annually founded spin-offs per tech facility:

- **Grade 0**: The average number of annually founded spin-offs per tech facility in Ukraine from 2017 to 2020 is 0; 2.03 less compared to the 2.03 annually founded spin-offs per tech facility in the selected East-Central European countries from 2017 to 2020.

Criteria: The average operating period of the country’s active tech facilities:

- **Grade 4**: The average operating period of Ukrainian tech facilities is 13 years as of the date of this report.

Evaluation of the indicator:

- **On performance**: The tech facilities offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R39. Creating tech parks.
- **Medium priority:** R40. Empowering tech facilities through technology clustering.

Table 135. List of tech facilities in Ukraine

#	Name of tech facility	Spin-offs / year	Founded year	Free working space	Laboratories	Access to interns
1	Polyteco Science City at Kyiv Polytechnic Institute	Unknown	2011	Yes	Yes	Yes
2	UNIT.City	Unknown	2017	Yes	Yes	Yes
3	Kharkiv IT Cluster	Unknown	2015	Yes	Yes	Yes
4	Lviv IT Cluster	Unknown	2012	Yes	Yes	Yes
5	Smart City Lviv	Unknown	2015	Yes	No	Yes
6	Smart City Kharkiv	Unknown	2018	Yes	No	Yes
7	"Academia" in Dnipro	Unknown	2010	Yes	No	Yes
8	Kyiv Smart City	Unknown	2015	Yes	No	Yes
9	Vuglemash (Donetsk)	Unknown	2001	Yes	Yes	Yes
10	State Scientific Institution "Institute for Single Crystals" (Kharkiv)	Unknown	2000	Yes	Yes	Yes
11	Technology park Yavoriv (Lviv)	Unknown	2007	Yes	Yes	Yes
12	Machine Building Technologies (Dnipro)	Unknown	2008	Yes	Yes	Yes
13	Dnipro Development Agency	Unknown	2017	Yes	Yes	Yes

Indicator 9.2. The existence of tech facilities to support the start-up creation in small urban and rural areas.

According to the country-level assessment, there are several city-level projects and institutions that the start-ups can also benefit from. The most relevant are (*see also table above)*:

- Smart City Lviv. In 2015, Lviv City Council announced a course on innovation in the city through the smart city approach and tools. Implementation of innovations involves cooperation between the authorities, public services, inhabitants and business representatives.
- Dnipro Development Agency. The Dnipro Development Agency was established by the Dnipro City Council's decision and is engaged in developing the city's infrastructure and increasing its attractiveness for investors. The Agency projects include a science and technology park named "Academia" and another industrial park. Also, the Dnipro–Smart City taskforce was created on its base. The task force is involved in implementing "smart city" projects.
- Smart City Kharkiv. Smart City Kharkiv is an image project of Kharkiv within the Invest Kharkiv Project framework, which promotes the introduction of innovations in the city.

Apart from those projects, four tech parks are located out of the capital Kyiv. Those are Vuglemash in Donetsk, State Scientific Institution "Institute for Single Crystals" in Kharkiv, Yavoriv in Lviv, Machine Building Technologies Centre in Dnipro (*see table above)*.

Criteria: The existence of tech facilities operating in the country's in small urban and rural area:

- **Grade 3**: Seven tech facilities in small urban and rural areas are operating in the Ukrainian ICT ecosystem.

Evaluation of the indicator:

- **On performance**: The tech facilities in small urban and rural areas offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R42. Creating tech parks in small urban areas.

KPI 10. Performance of the facilitators from the pre-seed to the early stage

Indicator 10.1. The existence of the business facilities to support the start-up development.

According to the country-level assessment, as of January 2021 there are a total of 75 co-working facilities offered for the start-ups[94]. Listed below are the relatively more significant facilities that provide higher-quality equipment, host trainings and events (*see table below*). The table also indicates the city where those centres are located.

Criteria: The existence of business facilities in the country:

- **Grade 3:** 75 business facilities are operating in the Ukrainian ICT ecosystem.

Criteria: The average operating period of the country's active business facilities:

- **Grade 4**: The average operating period of Ukrainian business facilities is five years as of the date of this report.

Evaluation of the indicator:

- **Optimal performance**: The business facilities offer optimal access to resources to start-ups from the seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.

Recommendations:

- **High priority:** R41. Boosting the promising start-ups through access to business centres.

Table 136. List of co-working spaces and business centres in Ukraine

#	Name of co-working space or business centre	Founding year
1	Dnipro: Coworking 365	2013
2	Dnipro: Soft Work	2019
3	Kharkiv: Fabrika Space	2015
4	Kharkiv: "Rozvytok" Creative hub	2017
5	Kharkiv: SpalahEduHub	2012
6	Kyiv: BeeWorking	2018
7	Kyiv: Chasopys	2012
8	Kyiv: Coworking Platform	2015
9	Kyiv: Creative Quarter	2016
10	Kyiv: Creative States	2018
11	Kyiv: Hub 4.0	2015
12	Kyiv: IC Coworking	2019
13	Kyiv: Peremoga Space	2017
14	Lviv: iHubLviv	2015
15	Lviv: KONTORA Lviv	2019

[94] More about co-working facilities offered in Ukraine: https://www.coworker.com/ukraine.

#	Name of co-working space or business centre	Founding year
16	Lviv: Platforma Futura	2019
17	Lviv: XLNT Spaces	2017
18	Odesa: 4City	2016
19	Odesa: Impact Hub	2013
20	Odesa: IQSpace	2015
21	Odesa: Terminal 42	2015

Involvement of the public sector in the development of the ecosystem

The level of involvement of the public entities, such as government, development agencies and international organisations, is key for the ecosystem's growth. Although these entities performance is not evaluated in this analysis, the authors summarise their involvement in the ICT entrepreneurial ecosystem's development in the sections below.

International organisations

According to the country-level assessment, international organisations are offering start-ups access to knowledge, capital, market and resources:

1) The most notable international organisations involvement in offering access to knowledge in the idea and pre-seed stages is delivered by the European Union and European Bank for Reconstruction and Development (EBRD), the USAID, the U.S. State Department Bureau of Oceans and International Environmental and Scientific Affairs, the Global Cleantech Innovation Programme and UNESCO as listed below:

    - In 2019, the EBRD and the EU supported under the EU4Business initiative a new digital initiative **called Merezha**: a digital platform that was launched to support Ukrainian SMEs in order to boost business development opportunities through access to vital knowledge. It is aimed to provide information on training, events, consulting opportunities, knowledge tools and other relevant data. Merezha is streamlining the existing SMEs development activities of the EBRD and EU and helps bring them to a new level in terms of relevance and efficiency.
    - In 2019, the **eō Business Incubators** were launched to support the Competitive Economic Programme by USAID.
    - The U.S. State Department Bureau of Oceans and International Environmental and Scientific Affairs' **Global Innovation through Science and Technology** (GIST) **initiative** offers the GIST programme to provide science and technology innovators of Ukraine with the training, mentoring and resources.
    - **The Global Cleantech Innovation Programme** (GCIP) is a global initiative to promote innovative technologies and create an ecosystem to support innovative entrepreneurship. Since 2019, they have been cooperating with the Ukrainian government by promoting clean technology innovations and entrepreneurship through a cleantech innovation platform and accelerator programme from the GCIP Ukraine Business Academy.
    - **UF Incubator** (Ukrainian Future Incubator), an initiative of the Junior Academy of Sciences of Ukraine under UNESCO's auspices, is a business incubator that helps turn an idea into a commercially successful start-up. They offer participants modern educational business programmes, help with the creation of a start-up team, search for investments and technical support of the project, provide mentoring from successful and experienced entrepreneurs, as well as access to co-working and prototyping labs, where inventors will be able to create layouts and working models of their projects.

2) The most notable international organisations involvement in offering access to knowledge in the idea and pre-seed stages is delivered by the Western NIS Enterprise Fund, the USAID funded Competitive Economy Programme (CEP) and the European Union and European Bank for Reconstruction and Development-funded (EBRD) Finance and Technology Transfer Centre for Climate Change (FINTECC) programme (CIV).

   In 2017, the Western NIS Enterprise Fund (WNISEF) announced the launch of U.Ventures, a fund focusing on investing in early-stage technology start-ups from Ukraine and Moldova.

   The Competitive Economy Programme (CEP) advances the Ukrainian economy by supporting business start-ups and SMEs on becoming more competitive in domestic and international markets. The programme also supports the local start-up ecosystem development, provides grants to early-stage and product-level start-ups, among many other components. It also plans to launch a venture capital fund in 2021 to work together with the eō Business Incubators in order to provide funding for the incubator teams and other start-ups in the ecosystem.

   The CIV project was initiated by the EBRD's FINTECC programme, financed by the EU Neighbourhood Investment Facility (NIF). It was expected that the CIV programme, with a total budget of €1 million, will support around 50 innovative projects in Ukraine. Vouchers for individual projects ranged from €20,000 to €50,000.

3) International donor organisations are not active in providing entrepreneurs access to the market. However, several associations that organise events and provide networking platforms for start-ups might apply to the criteria:

   - Industry4Ukraine is a collaborative platform of industry associations, clusters and other stakeholders, reflecting the vision of industrial development in Ukraine. One of the platform's key goals is to launch a strategy on building new processing facilities and digitalisation.
   - SocialBoost is a Ukrainian tech NGO that creates the synergy between start-up community and government to solve national challenges and create breakthroughs for developing economies. They support the creation of government e-services, train start-ups, consult businesses and organise industry-related events.
   - Noosphere is a non-governmental, non-commercial organisation aimed at developing the ecosystem for engineering start-ups through experience-sharing opportunities inside the industry, organising events, providing grants for research and connecting with the business sector. The initiative is new and there is still no publicly available data on its achievements.
   - The Polish-Ukrainian Start-up Bridge offers a cycle of meet-ups and conferences in different Ukrainian regions organised as part of the more comprehensive project "Support for Ukrainian SME's, particularly for the start-up projects" by the Polish Cooperation Fund Foundation.

   In 2017, Ukraine became part of the Enterprise Europe Network that connects around 600 business associations in 70 countries for networking and experience sharing. The EEN promotes innovative initiatives around Europe and searches for investors and business partners[95].

4) The most notable international organisations involvement in offering access to resources to start-ups is being delivered by the European Investment Bank for the Unit.City innovative campus.

   In June 2020, the European Investment Bank agreed on a €50 million loan to the capital's central innovation park, Unit City. In turn, the government plans to approve and send a letter to the bank about the financing proposal's relation to the scope of the framework agreement between Ukraine and the EIB. As of now, no information on proceedings for the programmes is available.

Government as an ecosystem builder

According to the country-level assessment, strategic directions for innovation development are further outlined in the Concept of the National Innovation System Development[96] and the Strategy of Development of Innovation

[95] More information about EEN initiatives: http://www.iop.kiev.ua/~een/index-en.html.
[96] Concept of the National Innovative System Development, approved by Decree of the CMU No. 680-p dated 17 June 2009.

Activity Sphere before 2030[97], approved by the government, and the Strategy of Sustainable Development "Ukraine-2020"[98]. The Strategy of Development of Innovation Activity Sphere before 2030 declares, among other things, that the need to support the development of high-tech activities, as well as to establish favourable conditions for the production of advanced technologies and goods, and the commercialisation of such products in Ukraine and abroad.

State support for the start-up teams was activated recently with the launch of the Ukrainian Start-up Fund (USF). The governing body of the fund is the Ministry of Finance of Ukraine. It provides pre-seed and seed funding in the amount of $25,000 and $50,000 to Ukrainian start-ups selected through competition and assessed as most promising, innovative and having a high probability of global commercial success. The USF budget amounts to ₴440 million (around $15,1 million)[99]. Out of 2000 applications, 39 companies received the grants. The amount of already provided funding exceeds $1,5 million[100].

The Fund of Entrepreneurship Development provides financial state aid to micro and small businesses to promote the development of entrepreneurship, prevent the expansion of COVID-19 and help overcome its consequences by refunding existing loan debts of entrepreneurs in Ukrainian banks. The fund's authorised capital amounts to ₴42,911,340 (around $1,81 million).

UkraineInvest (Ukraine Investment Promotion Office) is a government investment promotion agency established in 2016 to attract foreign direct investments to Ukraine. UkraineInvest offers one-stop services free-of-charge.[101] The activities of UkraineInvest are concentrated in the following fields:

1) Support of potential investors willing to invest in the Ukrainian market, helping them with identifying opportunities, connecting investors with stakeholders, providing consultations and information about the investment vehicles.
2) Ese of doing business direction: helping investors solve specific issues, advising the government on how to create a more business-friendly environment.
3) Communication of news among the international business community regarding the business environment and reforms in the country, participation in different business events.

The Ministry of Digital Transformation has control over the state's digital transformation and innovation policies. By 2024, this Ministry plans to digitise all public services and train about 6 million people in digital literacy[102]. The Ministry of Digital Transformation discusses the concept of a unique virtual economic zone that would implement simplified conditions for doing business and attract foreign investments to Ukraine. The project is called Diia City. Another project implemented by the Ministry is a digital education platform called Diia.Digital Education. The platform contains online courses in the form of educational series available free of charge.

Government as a regulator

According to the country-level assessment, **the Tax Code** does not provide any special regime for deep tech and innovative digital companies in Ukraine. However, some tax and customs benefits may apply to innovative or start-up companies on a general basis. The Tax Code provides two central taxation systems: general and simplified tax regimes (18% for corporate profit tax CPT) with tax holidays (0% CPT) or reduced CPT ratio depending on the income. The Law on Special Regime of Investment and Innovation Activity of Technological Parks provides a special regime for 16 Ukrainian technological parks. Such a particular regime has proven to be effective 15 years after the state registration of the respective technological park with the Ministry of Education and Science of Ukraine and five years for their projects.

Second, the Cabinet of Ministers of Ukraine adopted the Decree "On establishing an immigration quota for 2020"[103] stating that within the established **immigration quota**, Ukrainian IT companies can permanently employ 5,000 qualified IT specialists. Employees within the quota receive a permanent residence permit.

[97] The Strategy of Innovative Development of Economy of Ukraine till 2030.
[98] The Strategy of Sustainable Development "Ukraine-2020", approved by Order of the President of Ukraine No. 5/2015 dated 12 January 2015.
[99] More information about Ukrainian Start-up Fund budget: https://vctr.media/ufs-nachinaet-rabotat-32830/.
[100] More information about already provided funding for start-ups: https://usf.com.ua/.
[101] Information on UkrainInvest offers and services: https://ukraineinvest.gov.ua/.
[102] Digitalisation plan of the Ministry of Digital Transformation: https://plan2.diia.gov.ua/.
[103] № 431-r of March 11, 2020 "On establishing an immigration quota for 2020."

Third, the **Intellectual Property** legal frameworks of Ukraine are developed and sound, but there are issues with the implementation and enforcement, including lack of clarity regarding the responsibility of different ministries and lack of institutional capacity to implement the framework.

In addition, there is no particular regulatory framework or benefits for **business angels**[104].

Finally, the majority of Ukraine-born start-ups (70-80%) and venture capital funds are registered abroad. This is often caused by the fact that start-ups and funds seek a more favourable tax and regulatory regime. The regulatory framework in Ukraine for venture capital funds needs improvement, to incentivise them not to move their headquarters and operations abroad.

[104] Information collected during the EU4Digital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern partner countries".

9.3. Recommendations by priority in Ukraine

Below the experts list the **high and medium priority** recommendations necessary to empower the ICT entrepreneurial ecosystem of Ukraine.

Also, the detailed list of all main recommendations for capacity builders acting in the six Eastern Partnership countries can be found in Chapter 11.

Table 137. Priority recommendations for empowering the Ukrainian ICT entrepreneurial ecosystem

Recommendation	Priority	Area	Stage
R1. Creating universities´ entrepreneurial programmes	HIGH	KNOWLEDGE	IDEA
R4. Creating technology education centres	HIGH	KNOWLEDGE	IDEA
R5. Empowering technology education centres by implementing educational specialisation in emerging technologies	MEDIUM	KNOWLEDGE	IDEA
R8. Creating incubators	HIGH	KNOWLEDGE	PRE-SEED
R9. Empowering incubators by implementing specialised incubation programmes	MEDIUM	KNOWLEDGE	PRE-SEED
R11. Creating accelerators	HIGH	KNOWLEDGE	SEED
R12. Empowering accelerators by implementing specialised pre-acceleration programmes	MEDIUM	KNOWLEDGE	SEED
R15. Attracting international accelerators to the local ecosystem	HIGH	KNOWLEDGE	SEED
R17. Boosting mentorship associations by implementing access to service providers´ funding capacity	HIGH	KNOWLEDGE	EARLY
R18. Empowering specialised incubation by focusing on digitalisation of the local industry	HIGH	KNOWLEDGE	EARLY
R19. Empowering venture capital firms through fund of funds programmes	HIGH	CAPITAL	EARLY
R21. Boosting venture capital firms through access to international markets	MEDIUM	CAPITAL	EARLY
R24. Empowering business angels networks by strengthening the investment expertise	HIGH	CAPITAL	SEED
R25. Boosting business angels networks through co-investment matching programmes	MEDIUM	CAPITAL	SEED

Recommendation	Priority	Area	Stage
R26. Creating crowdfunding platforms	HIGH	CAPITAL	PRE-SEED
R29. Empowering talent generation events through sponsorship	HIGH	MARKET	IDEA
R31. Empowering entrepreneurial events through sponsorship	HIGH	MARKET	PRE-SEED
R32. Boosting entrepreneurial events through internationalisation	MEDIUM	MARKET	PRE-SEED
R33. Creating ICT ecosystem databases	HIGH	MARKET	SEED
R35. Empowering investment forums through sponsorship	HIGH	MARKET	SEED
R36. Boosting investment forums through internationalisation	MEDIUM	MARKET	SEED
R37. Empowering business forums through industry digitalisation	HIGH	MARKET	EARLY
R38. Boosting the promising start-ups through access to international trade fairs	MEDIUM	MARKET	EARLY
R39. Creating tech parks	HIGH	RESOURCES	IDEA
R40. Empowering tech facilities through technology clustering	MEDIUM	RESOURCES	IDEA
R41. Boosting the promising start-ups through access to business centres	HIGH	RESOURCES	EARLY
R42. Creating tech parks in small urban areas	HIGH	RESOURCES	IDEA

Chapter 10: Benchmarking Ecosystems of the Eastern Partner Countries

This chapter makes a comparison between the conversion ratios of the start-ups´ life cycle among the Eastern partner countries and the selected countries of East-Central Europe - Lithuania, Estonia, Poland, Bulgaria and Romania, which share similar characteristics in terms of population density, availability of investment, industry maturity, specialised talent, education and business environment.

The volume of investments in the country's start-ups at different growth stages was considered to obtain the ratios. The experts refer mainly to start-ups that have received investment rounds within the country of origin.

To calculate the start-ups' conversion ratios, two sources of information have been used:

1. EU4Dgital study "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern Partner countries".
2. Public data sources, CrunchBase and Dealroom.

The conversion ratios have been calculated based on the collected data, the number of registered start-ups and investments operations. The information used in this analysis refers to the start-ups who have been operating in their country of origin during the last five years (between 2015 – 2020).

It must be emphasized that the data used in this analysis is not exhaustive and the selected data source does not include the records of all the start-ups operating in the countries, nor all the investment deals that have been made. Only the start-ups which received the investments are counted. The start-ups that grow in their different stages without receiving investments have not been considered in this analysis. Therefore, the reader should consider that the ratios are also indicative estimates, which help better understand a global vision of the ecosystem stakeholders' performance, in conjunction with the previous chapters' country-level assessment.

10.1. Eastern partner countries

This subchapter provides a comparison of the Eastern partnership countries' ICT entrepreneurial ecosystems at the different stages of the start-ups' growth and conversion ratios.

There is a similarity in each Eastern partnership country's capacity to create start-ups in the idea stage, with an average of 0.04% of start-ups created per the country's population. Armenia creates the most start-ups in the idea stage with 0.06%, following 0.05 % in Moldova and Ukraine, to 0.04 % in Georgia, 0.03 % in Belarus and 0,02% in Azerbaijan. The small variations in data are mainly due to each country's capacity to generate entrepreneurial awareness, as in technological education.

In the region, it is observed that 5.32% of start-ups grow from the idea stage to the seed-stage, start-ups that develop a prototype and begin to validate their business model. In this case, Ukraine is the country with the most capacity to generate start-ups in the seed-stage with an 8.2% conversion rate, almost a 3% higher conversion ratio than the second country with the highest capacity, Belarus with a 5.61%, and more than double in comparison with Moldova, which has a ratio of 3.9%. These ratios are mainly due to the ecosystem's capacity to offer incubation programmes, access to grants and start-up creation environments, such as entrepreneurial events or workspaces.

1.11% of the region's start-ups receive a seed investment round while growing to the early-stage, thus starting to generate sales and validate the business. At the country level, Ukraine is again the country with the highest conversion ratio of 2.15%, followed by Belarus with 1.2%, and compared to Moldova, the country with the lowest conversion ratio with 0.36%. These ratios are mainly due to the acceleration and investment capacity in the seed-stage of the ecosystem.

The conversion ratio between the idea stage and scale-up is 0.19% in the region. In this case, the ratios are very close among the six countries. This ratio is mainly due to the ecosystem´s capacity to generate series A investments and keep the start-ups' headquarters in the country, through the work incentives and tax benefits, which we have mentioned in the previous chapters.

Regarding the "exits" generation, during the last five years, the region's ratio is 0.04%, with a similar ratio between Ukraine, Armenia, Belarus and Azerbaijan (0.06%-0.07%), compared to 0% of exits generated in Georgia and Moldova. However, the reader should once again keep in mind that the experts refer to the data of the start-ups and investments registered in the sources mentioned above.

The summarised view of the analysed data is provided in the table below.

Table 138. Eastern partner countries benchmarking

Country	Population (million)	Ratio to idea stage	Ratio idea to seed stage	Ratio idea to early stage	Ratio idea to scale-up	Ratio of exits
ARMENIA	2,96	0,06	5,23	1,10	0,23	0,06
AZERBAIJAN	9,98	0,02	4,78	0,90	0,13	0,06
BELARUS	9,48	0,03	5,61	1,20	0,29	0,07
GEORGIA	3,73	0,04	4,18	0,92	0,12	0,00
MOLDOVA	3,54	0,05	3,90	0,36	0,06	0,00
UKRAINE	41,98	0,05	8,20	2,15	0,29	0,06
EAP REGION	**71,67**	**0,04%**	**5,32%**	**1,11%**	**1,19%**	**0,04%**

10.2. Eastern partner countries compared to East-Central European countries

This subchapter provides the comparison of ICT entrepreneurial ecosystems of Eastern partnership countries with five selected East-Central European countries (Lithuania, Estonia, Poland, Bulgaria and Romania) that are similar in terms of ICT entrepreneurial ecosystems size, IT markets size, historical and cultural development path.

The start-up creation capacity versus the total population is 0.06% in East-Central European countries and 0.04% in Eastern partnership countries, representing a difference of 32.74%. This indicates that East-Central European countries generate better entrepreneurial education. Such a ratio may be surprising if one considers that the Eastern partnership countries have a deeply rooted engineering dating back to the Soviet Union times. However, this fact highlights the importance of entrepreneurial and business management education.

The conversion ratio from the idea stage to the seed-stage has a difference of 57.59% between the regions. This ratio demonstrates the importance of the quality of incubators and technology transfer departments, as well as access to capital in the pre-seed stage. Start-ups must be born with viable business ideas and small funds to develop their prototypes or MVP.

The difference between the ratios of idea-stage to early-stage start-ups that begin to generate sales is 73.88%. This is due to the fact that start-ups start their projects with unviable ideas and the market does not respond to customers. This emphasizes the educators' responsibility to support entrepreneurs with appropriate incubation programmes. On the other hand, other compelling reasons that justify this difference are the lack of access to capital in the seed round, where only 1.11% of start-ups receive investment, and the need for more professional acceleration programmes and more significant resources to support the access of start-ups to local markets.

The difference between the conversion ratios from the idea stage to scale-ups and start-ups with international growth capacities, is 70.57%. In addition to the factors discussed in the previous paragraph on educators' and investors' performance, there is also an important reason here: the emigration of start-ups to more favourable markets. We must remember that in this analysis, the experts only consider start-ups that maintain their headquarters in the region and investments made in the region.

The difference in the "exits" ratio is 77.94%. East-Central European countries have generated 74 exits in start-ups within the region, compared to 15 exits that have been generated in Eastern Partnership countries. This is the result of all the reasons stated in the previous paragraphs.

The summarised view of the analysed data is provided in the table below.

Table 139. East-Central European countries' versus Eastern partner countries' benchmarking

#	Country	Population (million)	Ratio to idea stage	Ratio idea to seed stage	Ratio idea to early stage	Ratio idea to scale-up	Ratio of exits
1	**EAST-CENTRAL EUROPE AVERAGE**	**79,80**	**0,06%**	**12,54%**	**4,24%**	**0,64%**	**0,19%**
1.1	**LITHUANIA**	2,80	0,11	14,23	4,84	0,79	0,30
1.2	**ESTONIA**	13,00	0,06	12,49	4,96	0,53	0,14
1.3	**POLAND**	38,00	0,04	11,91	3,21	1,25	0,27
1.4	**BULGARIA**	7,00	0,05	12,26	4,56	0,28	0,11
1.5	**ROMANIA**	19,00	0,04	11,79	3,64	0,35	0,14
2	**EAP REGION**	**71,67**	**0,04%**	**5,32%**	**1,11%**	**0,19%**	**0,04%**
2-1	**DIFFERENCE**	-	**-32,74%**	**-57,59%**	**-73,88%**	**-70,57%**	**-77,94%**

Chapter 11: Recommendations for Capacity Building Definition

This chapter defines and explores all the main recommendations for capacity builders acting in the Eastern partner countries. The recommendations are based on the indicators that measure the stakeholders' performance that compose the entrepreneurial ecosystem.

The main objective of the recommendations is to boost the growth of the entrepreneurial ecosystem by empowering its stakeholders, for which the recommendations are grouped into three categories: creating, empowering and boosting that are explained below. To implementation of the presented recommendations requires a preparation of detail action plan to and its successful execution.

- **CREATING**: The target of “creating" recommendations are non-existent stakeholders in the ecosystem. The recommendations aim to propose specific activities to create and develop stakeholders that do not exist in the ICT entrepreneurial ecosystem.

  In the "creating" recommendations, the experts propose to allocate resources that are necessary for the creation of stakeholders and their activities. Many of the "Creating" recommendations propose actions to support the professionalisation of stakeholder activities, which are also included in the "Empowering" recommendations. Thus, "Creating" recommendations should be considered as "Creating" + "Empowering".

- **EMPOWERING**: The target of “Empowering” recommendations is already established stakeholders performing at the “On performance” and / or “Acceptable performance” levels. The recommendations for empowering aim to support the sustainability of already established stakeholders' activities and responsibilities.

  In the "empowering" recommendations, the experts propose to offer expertise to the stakeholders, mainly international, to support their activities' professionalisation, according to local and international markets' needs. This high degree of expertise should help educators generate high-quality content and impact for entrepreneurs and start-ups.

- **BOOSTING**: The target of “Empowering” recommendations is already established stakeholders performing at the “Optimal performance” and / or “Excellent performance” levels. The recommendations aim to support the optimisation of current stakeholders' activities and responsibilities as well as scale their operations by applying the best international practices.

  In the "Boosting" recommendations, the experts propose to provide funding for the stakeholders to generate a larger capacity to support entrepreneurs and start-ups.

Recommendation composition

Each recommendation is composed of the following elements:

- **Title**: Name of recommendation.
- **Area**: Resource that the recommendation impacts (knowledge, capital, market and resources).
- **Target**: Type of stakeholders targeted by recommendation (educators, investors, connectors and facilitators).
- **Implementer**: Type of capacity builder responsible for the implementation of the recommendation.
- **Executor**: Type of entity responsible for executing the activities of the recommendation.
- **Related indicator**: Performance indicator that defines the recommendation.
- **Actions**: Concrete actions necessary to implement the recommendation.
- **Complexity**: Different types of resources (budget, timing, set-up budget, operational budget) and their complexity level that is required to implement the recommendation. To make this complexity factor more understandable, each resource is evaluated on a 5-levels scale from “Very Low” to “Very High” complexity of implementation. Also, the implementation period and amount of each resource are estimated, where applicable *(see table below).*

Table 140. The complexity level of recommendations

Complexity	Expertise	Timing	Yearly budget
VERY HIGH	Senior international expert	> 12 months	> €2 million
HIGH	International expert	8-12 months	€0,6 - €2 million
MEDIUM	Local expert	6-8 months	€200,000 - €0,5 million
LOW	-	3-6 months	€100,000 - €200,000
VERY LOW	-	< 2 months	< €100,000

Disclaimer: amounts are indicative and should serve as a direction rather than a precise evaluation.

11.1. List of recommendations

The index of recommendations[105] for capacity builders is dedicated to facilitating the reader before moving to a more detailed explanation of each recommendation (*see table below*).

Table 141. List of recommendations for capacity builders

Recommendation	Expertise	Timing	Budget	Yearly budget
R1. Creating universities´ entrepreneurial programmes	Very High	High	Low	Very Low
R2. Empowering universities by implementing specialised entrepreneurial programmes	Very High	Low	Very Low	Unknown
R3. Boosting universities by implementing high entrepreneurial education	Very High	Medium	Medium	Low
R4. Creating technology education centres	Very High	Very High	Medium	Very Low
R5. Empowering technology education centres by implementing educational specialisation in emerging technologies	Very High	Medium	Very Low	Unknown
R6. Boosting technology education centres by implementing educational specialisation in emerging technologies	Very High	High	Medium	Low
R7. Boosting technology education centres by funding capacity for R&D development	Very High	High	Very High	Very Low
R8. Creating incubators	High	High	Low	Low
R9. Empowering Incubators by implementing specialised incubation programmes	High	Medium	Very Low	Unknown
R10. Boosting incubators by implementing “idea-stage” grant schemes	High	High	High	Very Low
R11. Creating accelerators	High	High	Low	Low
R12. Empowering accelerators by implementing specialised pre-acceleration programmes	High	Medium	Very Low	Unknown
R13. Boosting accelerators by implementing seed-stage grant schemes	High	Medium	Medium	Very Low

[105] The suggested recommendations in this guide apply to any ICT entrepreneurial ecosystem. To make it practically adopted for the six Eastern partner countries, the recommendations are prioritised based on each country’s maturity level (priorities), implementation complexity and available resources.

Recommendation	Expertise	Timing	Budget	Yearly budget
R14. Boosting accelerators through access to local and international markets	Medium	High	Medium	Unknown
R15. Attracting international accelerators to the local ecosystem	High	High	High	Low
R16. Creating mentorship associations	Very High	Medium	Low	Low
R17. Boosting mentorship associations by implementing access to service providers´ funding capacity	Medium	Low	Medium	Unknown
R18. Empowering specialised incubation by focusing on digitalisation of the local industry	High	High	Medium	Low
R19. Empowering venture capital firms through fund of funds programmes	Very High	High	Very High	Unknown
R20. Creating venture capital firms	Very High	High	Very High	Medium
R21. Boosting venture capital firms through access to international markets	Very High	Medium	Medium	Unknown
R22. Attracting international venture capital firms to the local ecosystem	Very High	High	Very High	Medium
R23. Creating business angels networks	Very High	High	Medium	Low
R24. Empowering business angels networks by strengthening the investment expertise	High	Medium	Very Low	Unknown
R25. Boosting business angels networks through co-investment matching programmes	Very High	High	Very High	N/A
R26. Creating crowdfunding platforms	High	High	Medium	Low
R27. Empowering crowdfunding platforms through access to a critical mass of investors	High	High	Medium	Low
R28. Creating talent generation events	Medium	Medium	Low	Very Low
R29. Empowering talent generation events through sponsorship	Medium	Low	N/A	Very Low
R30. Creating entrepreneurial events	Medium	Medium	Medium	Very Low

Recommendation	Expertise	Timing	Budget	Yearly budget
R31. Empowering entrepreneurial events through sponsorship	Medium	Low	Medium	Very Low
R32. Boosting entrepreneurial events through internationalisation	High	High	Medium	Low
R33. Creating ICT ecosystem databases	High	High	Medium	Low
R34. Creating investment forums	Medium	Medium	Medium	Very Low
R35. Empowering investment forums through sponsorship	Medium	Low	Medium	Very Low
R36. Boosting investment forums through internationalisation	High	High	Medium	Very Low
R37. Empowering business forums by connecting private sector with ICT ecosystem	Medium	Low	Medium	Very Low
R38. Boosting the promising start-ups through access to international trade fairs	Medium	Medium	Low	Unknown
R39. Creating tech parks	Very High	Very High	Very High	Medium
R40. Empowering tech facilities through technology clustering	Very High	Very High	Very High	Medium
R41. Boosting the promising start-ups through access to business centres	Medium	Low	Medium	Low
R42. Creating tech parks in small urban areas	Very High	Very High	Very High	Medium

11.2. Recommendations

This subchapter's tables provide recommendations for the ICT entrepreneurial ecosystem capacity building definition and related explanations.

R1. Creating universities´ entrepreneurial programmes		
Area:	Knowledge	
Target:	Educators	
Implementer:	Aid Agency	
Executor:	International Experts	
Related indicator: • Indicator 1.1. The quality of universities´ entrepreneurial education programmes.		
Actions: • The implementer should select international experts on designing and implementing entrepreneurial educational programmes. • The implementer should provide the selected universities with funds and resources to establish facilities to provide the students access to entrepreneurial education programmes. • The implementer should provide the selected universities with funds to ensure the new facility's operations during the determined period. • The experts should design the entrepreneurial education programmes' content according to the ICT ecosystem demand. • The experts should implement the designed entrepreneurial education programmes by training the selected educators to acquire the required expertise.		
Complexity:		
Expertise:	VERY HIGH	Senior International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	LOW	€100,000 - €200,000 per university
Operational Budget:	VERY LOW	< €100,000 per university per year

R2. Empowering universities by implementing specialised entrepreneurial programmes		
Area:	Knowledge	
Target:	Educators	
Implementer:	Aid Agency	
Executor:	International Experts	
Related indicator: • Indicator 1.1. The quality of universities´ entrepreneurial education programmes.		
Actions: • The implementer should select international experts on designing and implementing entrepreneurial education programmes. • The experts should design the entrepreneurial education programmes' content according to the ICT ecosystem's demands. • The experts should implement the designed entrepreneurial education programmes by training the selected educators to acquire the required expertise.		
Complexity:		
Expertise:	VERY HIGH	Senior International Expert
Timing:	LOW	3-6 months
Set-up Budget:	VERY LOW	< €100,000 per university per year
Operational Budget:	N/A	

R3. Boosting universities by implementing high entrepreneurial education

Area:	Knowledge
Target:	Educators
Implementer:	Aid Agency
Executor:	International Experts

Related indicator:

- Indicator 1.1. The quality of universities´ entrepreneurial education programmes.

Actions:

- The implementer should select international experts on designing and implementing entrepreneurial MBA programmes.
- The experts should design the entrepreneurial MBA programmes' content according to the ICT ecosystem' demand.
- The experts should implement the designed entrepreneurial MBA programmes by training the selected educators to acquire the required expertise.
- The implementer should provide the selected universities with funds to offer their talented students scholarships to access the entrepreneurial MBA programmes.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	MEDIUM	6-8 Months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million
Operational Budget:	LOW	€100,000 - €200,000 per university per year

R4. Creating technology education centres

Area:	Knowledge
Target:	Educators
Implementer:	Aid Agency
Executor:	International Technology Education Centre

Related indicator:

- Indicator 1.2. The quality of technology educational centres giving access to specialisation in emerging technologies[106].

Actions:

- The implementer should select international experts on designing and implementing education programmes in emerging technologies.
- The implementer should provide the selected centre with funds and resources to establish facilities to provide the students access to emerging technologies education.
- The implementer should provide the selected centres with funds to ensure the new facility's operations during the determined period.
- The experts should design the emerging technologies education programmes' content according to the ICT ecosystem demand.
- The experts should implement the designed education programmes in emerging technologies by training the selected educators to acquire the required expertise.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	VERY HIGH	> 12 months
Set-up Budget:	MEDIUM	€ 200,000 - €0,5 million per centre
Operational Budget:	VERY LOW	< €100,000 per centre per year

[106] AI, IoT, Robotics, Dronica, HealthTech, CyberSecutirty, EnergyTech, NanoTech, Fintech, AGTech, AR/VR, and similar.

R5. Empowering technology education centres by implementing educational specialisation in emerging technologies		
Area:	Knowledge	
Target:	Educators	
Implementer:	Aid Agency	
Executor:	International Technology Education Centre	
Related indicator: • Indicator 1.2. The quality of technology education centres giving access to specialisation in emerging technologies[107].		
Actions: • The implementer should select international experts on designing and implementing educational programmes in emerging technologies. • The experts should design the emerging technologies education programmes' content according to the ICT ecosystem demand. • The experts should implement the designed emerging technologies education programmes by training the selected educators to acquire the required expertise.		
Complexity:		
Expertise:	VERY HIGH	Senior International Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	VERY LOW	< €100,000 per centre per year
Operational Budget:	N/A	

[107] AI, IoT, Robotics, Dronica, HealthTech, CyberSecutirty, EnergyTech, NanoTech, Fintech, AGTech, AR/VR, and similar.

R6. Boosting technology education centres by implementing educational specialisation in emerging technologies		
Area:	Knowledge	
Target:	Educators	
Implementer:	Aid Agency	
Executor:	International Technology Education Centre	
Related indicator: • Indicator 1.2. The quality of technology educational centres giving access to specialisation in emerging technologies[108].		
Actions: • The implementer should select international experts on designing and implementing education programmes in emerging technologies. • The implementer should provide the selected centre with funds and resources to establish facilities that provide students with access to specialise in emerging technologies. • The experts should design the emerging technologies postgraduate programmes' content according to the ICT ecosystem demand. • The experts should implement the designed emerging technologies postgraduate programmes by training the selected educators to acquire the required expertise. • The implementer should provide the selected centres with funds to offer their talented STEM students scholarships to access the emerging technologies postgraduate programmes.		
Complexity:		
Expertise:	VERY HIGH	Senior International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€200,000 - €0,50 million
Operational Budget:	LOW	€100,000 - €200,000 per centre per year

[108] AI, IoT, Robotics, Dronica, HealthTech, CyberSecutirty, EnergyTech, NanoTech, Fintech, AGTech, AR/VR, and similar.

R7. Boosting technology education centres by funding capacity[109] for R&D development		
Area:	Capital	
Target:	Educators	
Implementer:	International Financial Institution (IFI)	
Executor:	International Technology Education Centre	
Related indicator: • Indicator 1.2. The quality of technology education centres giving access to specialisation in emerging technologies[110].		
Actions: • The implementer should select international experts on designing and implementing grant schemes for technology research and development. • The experts should design a grant scheme[111] programme for technology research and development. • The experts should implement the designed grant scheme programme by training the selected centre to acquire the required expertise. • The implementer should provide the selected centre with funds to offer the STEM students access to capital for prototyping development[112].		
Complexity:		
Expertise:	VERY HIGH	Senior International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	VERY HIGH	> €2 million
Operational Budget:	VERY LOW	< €100,000 per centre per year

[109] Funding capacity for technology development (prototyping).
[110] AI, IoT, Robotics, Dronica, HealthTech, CyberSecutirty, EnergyTech, NanoTech, Fintech, AGTech, AR/VR, and similar.
[111] A grant scheme is a sum of money provided by a government, local authority, or public fund to finance start-ups, generally in the idea and pre-seed stage
[112] Prototyping development, means any kind of activities and resources that the engineers would require to develop their prototypes

R8. Creating incubators

Area:	Knowledge
Target:	Educators
Implementer:	Aid Agency
Executor:	International Incubator

Related indicator:

- Indicator 2.1. The quality of the incubators.

Actions:

- The implementer should select international experts on designing and implementing incubation programmes.
- The implementer should provide the interested party with funds and resources to establish facilities that provide the entrepreneurs access to the incubation programme.
- The implementer should provide the interested party with funds to ensure the new facility's operations during the determined period.
- The experts should design the “incubation education programmes” according to the ICT ecosystem's demand.
- The experts should implement the designed “incubation education programmes” by training the interested party staff to acquire the required expertise.
- The experts should provide the interested party with the capacity to offer the entrepreneurs certification in “Business Idea Validation” and “Product Design”.
- The experts should design the incubator action plan according to the ICT ecosystem's demand.
- The experts should implement the designed action plan by guiding the new incubator during the operations launching period.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	LOW	€100,000 - €200,000 per incubator
Operational Budget:	LOW	€100,000 - €200,000 per incubator per year

R9. Empowering incubators by implementing specialised incubation programmes

Area:	Knowledge
Target:	Educators
Implementer:	Aid Agency
Executor:	International Incubator

Related indicator:

- Indicator 2.1. The quality of the incubators.

Actions:

- The implementer should select international experts on designing and implementing incubation programmes.
- The implementer should provide the incubator´s managers with specialised expertise in management by sending them to international incubators.
- The experts should design the "incubation education programmes'" content according to the ICT ecosystem demand.
- The experts should implement the designed "incubation education programmes" by training the selected incubators staff to acquire the required expertise.
- The experts should provide the selected incubator with the capacity to offer the entrepreneurs certification in "Business Idea Validation" and "Product Design".

Complexity:

Expertise:	HIGH	International Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	VERY LOW	< €100,000 per incubator per year
Operational Budget:	N/A	

R10. Boosting incubators by implementing “idea-stage” grant schemes		
Area:	Capital	
Target:	Educators	
Implementer:	International Financial Institution (IFI)	
Executor:	International Incubator	
Related indicator: • Indicator 2.1. The quality of the incubators.		
Actions: • The implementer should select international experts on designing and implementing incubation programmes. • The experts should design a grant scheme[113] programme for incubated start-ups. • The experts should implement the designed grant scheme programme by training the selected educators to acquire the required expertise. • The implementer should provide the selected incubator with funds to offer the incubated start-ups access to capital in the idea stage.		
Complexity:		
Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	HIGH	€0,6 - €2 million
Operational Budget:	VERY LOW	< €100,000 per incubator per year

[113] A grant scheme is a sum of money provided by a government, local authority, or public fund to finance start-ups, generally in the idea and pre-seed stage

R11. Creating accelerators

Area:	Knowledge
Target:	Educators
Implementer:	Aid Agency
Executor:	International accelerator

Related indicator:

- Indicator 2.2. The quality of the accelerators.

Actions:

- The implementer should select international experts on designing and implementing acceleration programmes.
- The implementer should provide the interested party with funds and resources to establish facilities to provide the start-ups' access to the acceleration programme.
- The implementer should provide the interested party with funds to ensure the new facility's operations during the determined period.
- The experts should design the pre-acceleration programmes' content according to the ICT ecosystem demand.
- The experts should implement the designed pre-acceleration programme by training the selected educators to acquire the required expertise.
- The experts should provide the interested party with the capacity to offer the start-ups certification in “Business Model Validation”.
- The experts should design the accelerator action plan according to the ICT ecosystem demand.
- The experts should implement the designed action plan by guiding the new accelerator during the operation’s launch period.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	LOW	€100,000 - €200,000 per accelerator
Operational Budget:	LOW	€100,000 - €200,000 per accelerator per year

R12. Empowering accelerators by implementing specialised pre-acceleration programmes

Area:	Knowledge
Target:	Educators
Implementer:	Aid Agency
Executor:	International accelerator

Related indicator:

- Indicator 2.2. The quality of the accelerators.

Actions:

- The implementer should select international experts on designing and implementing acceleration programmes.
- The implementer should provide the accelerators´ managers with specialised expertise in management by sending them to international accelerators.
- The experts should design the pre-acceleration programmes' content according to the ICT ecosystem demand.
- The experts should implement the designed pre-acceleration programme by training the selected educators to acquire the required expertise.
- The experts should provide the selected accelerator with the capacity to offer the start-ups certification in “Business Model Validation”.

Complexity:

Expertise:	HIGH	International Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	VERY LOW	< €100,000 per accelerator
Operational Budget:	N/A	

R13. Boosting accelerators by implementing seed-stage grant schemes		
Area:	Capital	
Target:	Educators	
Implementer:	International Financial Institution (IFI)	
Executor:	International accelerator	
Related indicator: • Indicator 2.2. The quality of the accelerators.		
Actions: • The implementer should select international experts on designing and implementing acceleration programmes. • The experts should design a grant scheme[114] programme for accelerated start-ups. • The experts should implement the designed grant scheme programme by training the selected educators to acquire the required expertise. • The implementer should provide the selected accelerator with funds to offer the accelerated start-ups access to capital in the pre-seed stage and the seed stage.		
Complexity:		
Expertise:	HIGH	International Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per accelerator
Operational Budget:	VERY LOW	< €100,000 per accelerator per year

[114] A grant scheme is a sum of money provided by a government, local authority, or public fund to finance start-ups, generally in the idea and pre-seed stage

R14. Boosting accelerators through access to local and international markets		
Area:	Market	
Target:	Educators	
Implementer:	International Financial Institution (IFI)	
Executor:	International Financial Institution (IFI)	
Related indicator: • Indicator 2.2. The quality of the accelerators.		
Actions: • The implementer should create a relevant database of local and international private sector representatives and investors. • The implementer should provide the selected accelerator with funds for establishing connections with local and international private sector representatives.		
Complexity:		
Expertise:	MEDIUM	Local Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per accelerator per year
Operational Budget:	N/A	

R15. Attracting international accelerators to the local ecosystem

Area:	Market
Target:	Educators
Implementer:	International Financial Institution (IFI)
Executor:	International accelerator

Related indicator:

- Indicator 2.3. The existence of international accelerators operating in the country.

Actions:

- The implementer should provide the selected international accelerator with funds and resources to establish facilities in the local ecosystem that provide the start-ups with access to their acceleration programme.
- The implementer should provide the selected international accelerator with funds to ensure the new facility's operations during the determined period.
- The implementer should provide the selected international accelerator with funds to offer the accelerated start-ups access to capital in the pre-seed stage and the seed stage.
- The implementer should provide the selected international accelerator with funds that offer the local start-ups transportation, accommodation and soft-landing in international markets.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	HIGH	€0,6 - €2 million
Operational Budget:	LOW	€100,000 - €200,000 per year

R16. Creating mentorship associations

Area:	Knowledge
Target:	Educators
Implementer:	Aid Agency
Executor:	International Experts

Related indicator:

- Indicator 3.1. The existence of mentorship associations.

Actions:

- The implementer should select international experts on establishment of the mentorship associations.
- The implementer should provide the interested party with funds and resources to establish facilities that provide the start-ups with access to certified mentors.
- The implementer should provide the interested party with funds to ensure the new facility's operations during the determined period.
- The experts should design the association action plan according to the ICT ecosystem demand.
- The experts should implement the designed action plan by guiding the new mentorship association during the operation's launch period.
- The experts should provide the new mentorship association with the capacity to offer their members certification in “Mentorship”.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	LOW	€100,000 - €200,000 per association
Operational Budget:	LOW	€100,000 - €200,000 per association per year

R17. Boosting mentorship associations by implementing access to service providers´ funding capacity

Area:	Knowledge	
Target:	Educators	
Implementer:	Aid Agency	
Executor:	Mentorship Associations	

Related indicator:

- Indicator 3.1. The existence of mentorship associations.

Actions:

- The implementer should provide the selected mentorship association with funds that offer the start-ups access to service providers, such as consulting services, legal services, financial and human resources services, marketing services, etc.

Complexity:

Expertise:	MEDIUM	Local Expert
Timing:	LOW	3-6 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per association
Operational Budget:	N/A	

R18. Empowering specialised incubation by focusing on digitalisation of the local industry

Area:	Knowledge
Target:	Educators
Implementer:	Aid Agency
Executor:	International Incubator

Related indicator:

- Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

Actions:

- The implementer should select international experts on implementation of incubation programmes on digital transformation of the industry.
- The implementer should provide the selected industry-focus incubator with funds and resources to establish facilities that provide the entrepreneurs with access to the incubation programme.
- The implementer should provide the selected incubator with funds to ensure the new facility's operations during the determined period.
- The experts should design the industry-focus incubation programmes' content according to the ICT ecosystem demand.
- The experts should implement the designed industry-focus incubation programme by training the selected educators to acquire the required expertise.
- The experts should provide the selected industry-focus incubator with the capacity to offer the entrepreneurs certification in “Business Idea Validation” and “Product Design”.
- The experts should design the industry-focus incubator action plan according to the ICT ecosystem demand.
- The experts should implement the designed action plan by guiding the industry-focus incubator during the operation's launch period.
- The implementer should provide the selected industry-focus incubator with funds for establishing connections with selected national industry representatives.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million
Operational Budget:	LOW	€100,000 - €200,000 per incubator per year

R19. Empowering venture capital firms through fund of funds programmes

Area:	Capital
Target:	Investors
Implementer:	International Financial Institution (IFI)
Executor:	International Financial Institution (IFI)

Related indicator:

- Indicator 5.1. The quality of the local venture capital firms.

Actions:

- The implementer should select international experts on designing and implementing funding programmes for venture capital firms.
- The experts should design a fund of funds programme for local venture capital firms.
- The implementer should provide the selected venture capital firms with funds that offer start-ups access to capital.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	VERY HIGH	> €2 million per venture capital firm
Operational Budget:	N/A	

R20. Creating venture capital firms

Area:	Capital
Target:	Investors
Implementer:	International Financial Institution (IFI)
Executor:	International Financial Institution (IFI)

Related indicator:

- Indicator 5.1. The quality of the local venture capital firms.

Actions:

- The implementer should select international experts on designing and establishing venture capital firms.
- The implementer should provide the interested party with funds and resources to establish facilities that provide the start-ups with access to capital.
- The implementer should provide the interested party with funds to ensure the new facility's operations during the determined period.
- The experts should design the venture capital action plan according to the ICT ecosystem demand.
- The experts should implement the designed action plan by guiding the new venture capital firm during the operation's launch period.
- The implementer should provide the selected new venture capital firm with funds that offer start-ups access to capital.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	VERY HIGH	> €2 million per venture capital
Operational Budget:	MEDIUM	€200,000 - €0,50 million per venture capital firm per year

R21. Boosting venture capital firms through access to international markets		
Area:	Capital	
Target:	Investors	
Implementer:	International Financial Institution (IFI)	
Executor:	International Financial Institution (IFI)	
Related indicator: • Indicator 5.1. The quality of the local venture capital firms.		
Actions: • The implementer should create a local and international database of relevant investor representatives. • The implementer should provide the selected venture capital firms with funds to establish connections with international private sector representatives.		
Complexity:		
Expertise:	VERY HIGH	Senior International Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per venture capital firm
Operational Budget:	N/A	

R22. Attracting international venture capital firms to the local ecosystem

Area:	Capital
Target:	Investors
Implementer:	International Financial Institution (IFI)
Executor:	International Financial Institution (IFI)

Related indicator:

- Indicator 5.2. The existence of international venture capital firms operating in the country.

Actions:

- The implementer should create a database of international venture capital firms to select the most appropriate firm according to the needs of the ICT ecosystem.
- The implementer should provide the selected international venture capital with funds and resources to establish facilities in the local ecosystem.
- The implementer should provide the selected international venture capital with funds to ensure the new facility's operations during the determined period.
- The implementer should provide the selected international venture capital with funds that offer start-ups access to capital.
- The implementer should provide the selected international venture capital with funds that offer the local start-ups transportation and accommodation to soft-landing in international markets.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	VERY HIGH	> €2 million
Operational Budget:	MEDIUM	€200,000 - €0,5 million per venture capital firm per year

R23. Creating business angels networks

Area:	Capital
Target:	Investors
Implementer:	International Financial Institution (IFI)
Executor:	International Financial Institution (IFI)

Related indicator:

- Indicator 5.3. The quality of the business angels networks.

Actions:

- The implementer should select international experts on designing and establishing business angels networks.
- The implementer should provide the interested party with funds and resources to establish facilities to provide the start-ups access to capital.
- The implementer should provide the interested party with funds to ensure the new facility's operations during the determined period.
- The experts should design the business angels network´s action plan according to the ICT ecosystem demand.
- The experts should implement the designed action plan by guiding the new business angels network during the operation's launch period.
- The implementer should provide the new business angels network with funds that offer the start-ups access to capital.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per angels network
Operational Budget:	LOW	€100,000 - €200,000 per angels network per year

R24. Empowering business angels networks by strengthening the investment expertise		
Area:	Capital	
Target:	Investors	
Implementer:	International Financial Institution (IFI)	
Executor:	International Financial Institution (IFI)	
Related indicator: • Indicator 5.3. The quality of the business angels networks.		
Actions: • The implementer should select international experts on designing and establishing business angels networks. • The experts should design the angel investing training content according to the ICT ecosystem demand. • The experts should implement the designed training by training the selected business angels to acquire the required expertise.		
Complexity:		
Expertise:	HIGH	International Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	VERY LOW	< €100,000 per pool of pieces of training
Operational Budget:	N/A	

R25. Boosting business angels networks through co-investment matching programmes

Area:	Capital
Target:	Investors
Implementer:	International Financial Institution (IFI)
Executor:	International Financial Institution (IFI)

Related indicator:

- Indicator 5.3. The quality of the business angels networks.

Actions:

- The implementer should select international experts on designing and establishing business angel networks.
- The experts should design a co-investment matching programme for local business angels networks.
- The implementer should provide the selected business angel networks with funds that offer start-ups access to capital.
- The experts should design the co-investment matching programme´s action plan according to the ICT ecosystem demand.
- The experts should implement the designed action plan by guiding the business angels network during the operation's launch period.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	VERY HIGH	€ 0,6 - €2 million per business angels network
Operational Budget:	N/A	

R26. Creating crowdfunding platforms

Area:	Capital
Target:	Investors
Implementer:	International Financial Institution (IFI)
Executor:	International Financial Institution (IFI)

Related indicator:

- Indicator 4.1. The existence of crowdfunding platforms in the country.

Actions:

- The implementer should select international experts on designing and establishing crowdfunding platforms.
- The implementer should provide the interested party with funds and resources to develop the digital crowdfunding tools and investment catalogue that provide the start-ups with access to capital.
- The implementer should provide the selected interested party with funds to ensure the new crowdfunding platform´s operations during the determined period.
- The experts should design the crowdfunding platform action plan according to the ICT ecosystem demand.
- The experts should implement the new crowdfunding platform plan by guiding the investment firm during the operation's launch period.
- The implementer should provide the new crowdfunding platform with funds to launch the crowdfunding platform and implement the marketing actions needed to acquire a critical mass of independent investors.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€0,6 - €2 million per crowdfunding platform
Operational Budget:	LOW	€100,000 - €200,000 per crowdfunding platform per year

R27. Empowering crowdfunding platforms through access to a critical mass of investors

Area:	Capital
Target:	Investors
Implementer:	International Financial Institution (IFI)
Executor:	International Financial Institution (IFI)

Related indicator:

- Indicator 4.1. The existence of crowdfunding platforms in the country.

Actions:

- The implementer should select international experts on designing and establishing crowdfunding platforms.
- The experts should design the crowdfunding platform action plan according to the ICT ecosystem demand.
- The experts should implement the crowdfunding platform plan by guiding the investment firm during the operation's launch period.
- The implementer should provide the selected investment firm with funds to implement the marketing actions needed to acquire a critical mass of independent investors.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€0,6 - €2 million per crowdfunding platform
Operational Budget:	LOW	€100,000 - €200,000 per crowdfunding platform per year

R28. Creating talent generation events

Area:	Market
Target:	Connectors
Implementer:	Aid Agency
Executor:	Aid Agency

Related indicator:

- Indicator 6.1. The existence of talent generation events.

Actions:

- The implementer should select international experts on designing and implementing entrepreneurial events
- The implementer should provide the interested party with funds and resources needed to develop a number of talent generation events.
- The implementer should provide the interested party with funds to ensure the events' recurrence during the determined period.
- The experts should design the talent generation events´ action plan according to the ICT ecosystem demand.
- The experts should implement the action plan by guiding the new event management company during the operation's launch period.
- The implementer should provide the new event management company with funds to promote and manage the talent generation events.

Complexity:

Expertise:	MEDIUM	Local Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	LOW	€100,000 - € 200,000 per group of events
Operational Budget:	VERY LOW	< €100,000 per incubator per year

R29. Empowering talent generation events through sponsorship

Area:	Market
Target:	Connectors
Implementer:	Aid Agency
Executor:	Aid Agency

Related indicator:

- Indicator 6.1. The existence of talent generation events.

Actions:

- The implementer should select international experts on designing and implementing entrepreneurial events.
- The implementer should provide the selected event management company with funds and resources to develop a number of talent generation events.
- The implementer should provide the selected event management company with funds to promote and manage the talent generation events.

Complexity:

Expertise:	MEDIUM	Local Expert
Timing:	LOW	3-6 months
Set-up Budget:	N/A	
Operational Budget:	VERY LOW	< €100,000 per incubator per year

R30. Creating entrepreneurial events

Area:	Market
Target:	Connectors
Implementer:	Aid Agency
Executor:	Aid Agency

Related indicator:

- Number 7.1. The quality of the entrepreneurial events.

Actions:

- The implementer should select international experts on designing and implementing entrepreneurial events.
- The implementer should provide the selected event management company with funds and resources to develop a number of entrepreneurial events.
- The implementer should provide the selected event management company with funds to ensure the events' recurrence during the determined period.
- The experts should design the entrepreneurial events´ action plan according to the ICT ecosystem demand.
- The experts should implement the action plan by guiding the event management company during the operation's launch period.
- The implementer should provide the selected event management company with funds to promote and manage the entrepreneurial events.

Complexity:

Expertise:	MEDIUM	Local Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per pool of events
Operational Budget:	VERY LOW	< €100,000 per accelerator per year

R31. Empowering entrepreneurial events through sponsorship		
Area:	Market	
Target:	Connectors	
Implementer:	Aid Agency	
Executor:	Aid Agency	
Related indicator: • Nu Indicator 7.1. The quality of the entrepreneurial events.		
Actions: • The implementer should select international experts on designing and implementing entrepreneurial events. • The implementer should provide the selected event management company with funds and resources to develop a number of entrepreneurial events. • The implementer should provide the selected event management company with funds to promote and manage the entrepreneurial events.		
Complexity:		
Expertise:	MEDIUM	Local Expert
Timing:	LOW	3-6 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per pool of events
Operational Budget:	VERY LOW	< €100,000 per accelerator per year

R32. Boosting entrepreneurial events through internationalisation

Area:	Market
Target:	Connectors
Implementer:	Aid Agency
Executor:	An international entrepreneurial event management company

Related indicator:

- Indicator 7.1. The quality of the entrepreneurial events.

Actions:

- The implementer should select international experts on designing and implementing entrepreneurial events.
- The implementer should provide the selected event management company with funds and resources to develop an annual international entrepreneurial event.
- The implementer should provide the selected event management company with funds to ensure the events' recurrence during the determined period.
- The experts should design the international entrepreneurial event´s action plan based on the ICT ecosystem demand.
- The implementer should provide the selected event management company with funds to promote and manage the international entrepreneurial event.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per pool of events
Operational Budget:	LOW	€100,000 - €200,000 per year

R33. Creating ICT ecosystem databases

Area:	Market
Target:	Connectors
Implementer:	Aid Agency
Executor:	Local Media

Related indicator:

- Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem.

Actions:

- The implementer should select international experts on designing and implementing entrepreneurial databases.
- The implementer should provide the interested party with funds and resources to develop the digital ICT entrepreneurial ecosystem database that provides the entrepreneurs with relevant news and information about the activities of the ecosystem´s entrepreneurs, start-ups, and stakeholders.
- The implementer should provide the interested party with funds to ensure the database´s operations during the determined period.
- The experts should design the database´s implementation plan according to the ICT ecosystem demand.
- The experts should implement the ICT entrepreneurial ecosystem database plan by guiding the new media channel during the operation's launch period.
- The implementer should provide the selected new media channel with funds to launch the database and implement the marketing actions needed to acquire a critical mass of users.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€0,6 - €2 million per ecosystem database
Operational Budget:	LOW	€100,000 - €200,000 per ecosystem base per year

R34. Creating investment forums

Area:	Market
Target:	Connectors
Implementer:	Aid Agency
Executor:	Local Investor

Related indicator:

- Indicator 8.1. The existence of investment forums.

Actions:

- The implementer should select international experts on designing and implementing investment events.
- The implementer should provide the selected investor with funds and resources needed to develop a number of investments forums.
- The implementer should provide the selected investor with funds needed to ensure the forums' recurrence during the determined period.
- The experts should design the investments forums´ action plan according to the ICT ecosystem demand.
- The experts should implement the action plan by guiding the investor during the operation's launch period.
- The implementer should provide the selected investor with funds to promote and manage the investment forums.

Complexity:

Expertise:	MEDIUM	Local Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per pool of forums
Operational Budget:	VERY LOW	< €100,000 per investor per year

R35. Empowering investment forums through sponsorship

Area:	Market	
Target:	Connectors	
Implementer:	Aid Agency	
Executor:	Local Investor	

Related indicator:

- Indicator 8.1. The existence of investment forums.

Actions:

- The implementer should select international experts on designing and implementing investment forums.
- The implementer should provide the selected investor with funds and resources to develop a number of investments forums.
- The implementer should provide the selected investor with funds that promote and manage the investments forums.

Complexity:

Expertise:	MEDIUM	Local Expert
Timing:	LOW	3-6 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per pool of forums
Operational Budget:	VERY LOW	< €100,000 per investor per year

R36. Boosting investment forums through internationalisation

Area:	Market
Target:	Connectors
Implementer:	Aid Agency
Executor:	Local Investor

Related indicator:

- Indicator 8.1. The existence of investment forums.

Actions:

- The implementer should select international experts on designing and implementing entrepreneurial forums.
- The implementer should provide the selected investor with funds and resources to develop an annual international investment forum.
- The implementer should provide the selected investor with funds to ensure the forum´s recurrence during the determined period.
- The experts should design the international investments forum´s action plan based on the ICT ecosystem demand.
- The experts should implement the action plan by guiding the investor during the operations' launch period.
- The implementer should provide the selected investor with funds to promote and manage the international investments forum.

Complexity:

Expertise:	HIGH	International Expert
Timing:	HIGH	8-12 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per forum
Operational Budget:	VERY LOW	< €100,000 per forum per year

R37. Empowering business forums by connecting private sector with ICT ecosystem

Area:	Market
Target:	Connectors
Implementer:	Aid Agency
Executor:	Local Business Associations

Related indicator:

- Indicator 8.2. The existence of national trade fairs and business forums.

Actions:

- The implementer should select international experts on designing and implementing business forums connecting private sector with ICT ecosystem actors.
- The implementer should provide the selected business associations with funds and resources to develop a number of sectorial business forums that match the industrial digitalisation's needs with those of the ICT entrepreneurial ecosystem.
- The implementer should provide the selected business associations with funds to promote and manage the business forums.

Complexity:

Expertise:	MEDIUM	Local Expert
Timing:	LOW	3-6 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per pool of forums
Operational Budget:	VERY LOW	< €100,000 per business association per year

R38. Boosting the promising start-ups through access to international trade fairs		
Area:	Market	
Target:	Connectors	
Implementer:	Aid Agency	
Executor:	Local Accelerators	
Related indicator: • Indicator 8.2. The existence of national trade fairs and business forums.		
Actions: • The implementer should provide the selected accelerators with funds and resources needed to present the most promising start-ups in the relevant international trade fairs. • The implementer should provide the selected accelerators with funds needed to ensure the recurrence during the determined period.		
Complexity:		
Expertise:	MEDIUM	Local Expert
Timing:	MEDIUM	6-8 months
Set-up Budget:	LOW	€100,000 - €200,000 per trade fair per year
Operational Budget:	N/A	

R39. Creating tech parks

Area:	Resources
Target:	Facilitators
Implementer:	Aid Agency
Executor:	International Tech Park

Related indicator:

- Indicator 9.1. The quality of tech facilities to support the start-up creation.

Actions:

- The implementer should select international experts on designing and establishing of tech parks.
- The implementer should provide the interest party with funds and resources needed to build the tech park.
- The implementer should provide the interest party with funds needed to ensure the new tech park's operations during the determined period.
- The experts should design the tech park's implementation plan based on the ICT ecosystem demand.
- The experts should implement the action plan by guiding the new tech park during the operation's launch period.
- The experts should design the new tech park educational and entrepreneurial programmes' content according to the ICT ecosystem's demands.
- The experts should implement designed programmes by training the new tech park staff.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	VERY HIGH	> 12 months
Set-up Budget:	VERY HIGH	> €2 million per tech park
Operational Budget:	MEDIUM	€200,000 - €0,5 million per centre per year

R40. Empowering tech facilities through technology clustering[115]

Area:	Resources
Target:	Facilitators
Implementer:	Aid Agency
Executor:	Aid Agency

Related indicator:

- Indicator 9.1. The quality of tech facilities to support the start-up creation.

Actions:

- The implementer should select international experts on designing and establishing of tech parks
- The implementer should provide the selected tech facility with funds and resources to establish facilities that provide the local tech facilities with access to international industrial clusters.
- The implementer should provide the selected tech facility with funds to ensure operations during the determined period.
- The implementer should provide the selected tech facility with funds that allow STEM engineers and entrepreneurs to develop prototypes, licenses and IP protection.
- According to the international industrial clusters´ demands, the experts should design the technology cluster's implementation plan.
- The experts should implement the action plan by guiding the foundation during the operations launching period.
- The implementer should provide the selected tech facility with funds to access international industrial clusters and promote the technology cluster´s innovations.

Complexity:

Expertise:	VERY HIGH	Senior International Expert
Timing:	VERY HIGH	> 12 months
Set-up Budget:	VERY HIGH	> €2 million per foundation
Operational Budget:	MEDIUM	€200,000 - €0,5 million per foundation per year

[115] Technology cluster (also referred as industry or innovation cluster) - is a geographic concentration of interconnected companies and institutions in a particular field. Common components: start-ups, SMEs, large companies, research universities, government bodies.

R41. Boosting the promising start-ups through access to business centres		
Area:	Resources	
Target:	Facilitators	
Implementer:	Aid Agency	
Executor:	Local business centre	
Related indicator: • Indicator 10.1. The existence of business facilities to support the start-up development.		
Actions: • The implementer should provide the selected business centre[116] with funds and resources needed to allow the most promising start-ups to relocate to the centre´s facilities, and offer start-ups access to the centre´s services. • The implementer should provide the selected business centre with funds to develop a business environment by creating new services, facilities and networking events.		
Complexity:		
Expertise:	MEDIUM	Local expert
Timing:	LOW	3-6 months
Set-up Budget:	MEDIUM	€200,000 - €0,5 million per pool of start-ups
Operational Budget:	LOW	€100,000 - €200,000 per centre per year

[116] A business centre is a place providing to companies with office facilities and services.

R42. Creating tech parks in small urban areas

Area:	Resources
Target:	Facilitators
Implementer:	Aid Agency
Executor:	International / Local Tech Park

Related indicator:

- Indicator 9.2. The existence of tech facilities to support the start-up creation in small urban and rural areas.

Actions:

- The implementer should select international / local experts on designing and establishing of tech-parks.
- The implementer should provide the interest party with funds and resources to build the tech park.
- The implementer should provide the interested party with funds to ensure the new tech park's operations during the determined period.
- According to the ICT ecosystem's demands, the experts should design the tech park's implementation plan.
- The experts should implement the action plan by guiding the new tech park during the operation's launch period.
- The experts should design the new tech park educational and entrepreneurial programmes' content according to the ICT ecosystem demand.
- The experts should implement designed programmes by training staff of the new tech park.

Complexity:

Expertise:	VERY HIGH	Senior International / Local Expert
Timing:	VERY HIGH	> 12 months
Set-up Budget:	VERY HIGH	> €2 million per tech park
Operational Budget:	MEDIUM	€200,000 - €0,5 million per centre per year

Annex 1: Indicators' evaluation criteria

This annex develops the performance evaluation method of each indicator that composes the KPIs.

To evaluate each criterion's grade, the experts base the amounts of the selected countries in East-Central Europe on level 3. This level 3 is based on the comparative start-ups´ lifecycle development, obtained in Chapter 10 "Benchmarking the EaP ecosystems", where the selected East-Central European countries maintain close percentages with the Western European countries, and where the most mature ecosystems in the world - the State of California (US) and Israel, have higher percentages. From grade 3, the experts evaluate grade 2 at an approximately 25% less quantity, grade 1 at an approximately 50% less quantity, grade 4 at an approximately 25% or higher quantity, and grade 0 at stakeholders' non-existence.

Conclusions for each indicator are made based on the five-level evaluation:

- **Non-existent:** The referred stakeholders are non-existent in the ecosystem.
- **On performance:** The referred stakeholders are offering limited access to the ecosystem growth elements but are establishing and professionalising their activities and responsibilities.
- **Acceptable performance:** The referred stakeholders are meeting the demand for the ecosystem´s required growth elements. Stakeholders are properly developing their activities and responsibilities by impacting the entrepreneurs and start-ups inside the ecosystem.
- **Optimal performance:** The referred stakeholders are operating optimally, similar to stakeholders of the selected East-Central European countries, and fully integrating their responsibilities in the ecosystem.
- **Excellent performance:** The referred stakeholders are over-performing stakeholders of the selected East-Central European countries, obtaining a significant impact on their activities and responsibilities with the entrepreneurs and start-ups.

Indicator 1.1. The quality of universities´ entrepreneurial education programmes.

Criteria 1: The percentage of universities offering entrepreneurial education programmes.

To calculate the percentage of universities offering entrepreneurial education programmes, the TopUniversities database has been used, which is currently the largest search engine for university education on the Internet. According to the database, there are more than 960 universities in the 5 selected countries.

The 15 most relevant universities in each country were analysed to perform the calculation, where 85% of them offer entrepreneurship education in the form of workshops or short-term educational programmes. On the other hand, 78% of the universities analysed offer advanced education programmes in the form of Masters degrees, focusing on entrepreneurship. The relevant examples in Lithuania are: Vilnius University, Vytautas Magnus University, Kaunas University of Technology.

According to the start-ups database Dealroom, 368 universities from the selected East-Central European countries have created 4.416 start-ups (spin-offs) between 2012 and 2020.

Graduation definition:

- Grade 0: Percentage of universities offering entrepreneurial education programmes is lower than 5%.
- Grade 1: Percentage of universities offering entrepreneurial education programmes is between 6% and 25%.
- Grade 2: Percentage of universities offering entrepreneurial education programmes is between 26% and 50%.
- Grade 3: Percentage of universities offering entrepreneurial education programmes is between 51% and 75%.
- Grade 4: Percentage of universities offering entrepreneurial education programmes is higher than 76%.

Evaluation definition:

- **Non-existent**: There are no university entrepreneurial educational programmes in the country´s ICT entrepreneurial ecosystem that offer access to knowledge to talented individuals.
- **On performance**: The university entrepreneurial educational programmes offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The university entrepreneurial educational programmes offer adequate access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The university entrepreneurial educational programmes offer optimal access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The university entrepreneurial educational programmes offer excellent access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Indicator 1.2. The quality of technology education centres giving access to specialisation in emerging technologies.

Criteria 1: The estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants.

To calculate the number of technology education centres giving access to specialisation in emerging technologies, the experts had access to the largest ICT entrepreneurial databases, Dealroom and CrunchBase. According to the databases, 416 entities offer high-tech education in the five selected East-Central European countries through 1.664 centres. The estimated number of high-tech educational entities giving access to specialisation in emerging technologies per million inhabitants in the selected East-Central European countries is 24.4.

Graduation definition:

- Grade 0: Estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants in the country is 0.
- Grade 1: Estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants in the country is between 0.01 and 7.
- Grade 2: Estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants in the country is between 7,01 and 14.
- Grade 3: Estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants in the country is between 14,01 and 21.
- Grade 4: Estimated number of technology education entities giving access to specialisation in emerging technologies per million inhabitants in the country is higher than 21.01.

Evaluation definition:

- **Non-existent**: There are no technology education entities in the country´s ICT entrepreneurial ecosystem that offer access to specialisation in emerging technologies to talented individuals.
- **On performance**: The technology education entities offer limited access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The technology education entities offer adequate access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The technology education entities offer optimal access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The technology education entities offer excellent access to specialisation in emerging technologies to talented individuals in the country´s ICT entrepreneurial ecosystem.

Indicator 2.1. The quality of the incubators.

Criteria 1: The estimated number of incubators per million inhabitants.

To calculate the number of incubators operating in the ICT ecosystem, the experts had access to the largest ICT entrepreneurial databases, Dealroom and CrunchBase. According to the databases, 139 incubators are operating in the five selected East-Central European countries, and 119 are connected with the universities. The estimated number of incubators per million inhabitants in the selected East-Central European countries is 2.04.

Graduation definition:

- Grade 0: Number of incubators per million inhabitants in the country is 0.
- Grade 1: Number of incubators per million inhabitants in the country is between 0.01 and 1.
- Grade 2: Number of incubators per million inhabitants in the country is between 1,01 and 2.
- Grade 3: Number of incubators per million inhabitants in the country is between 2.01 and 3.
- Grade 4: Number of incubators per million inhabitants in the country is higher than 3.01.

Criteria 2: The average operating period of the country's active incubators.

To calculate the country's active incubators' operating period, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's active incubators is less than 2 years.
- Grade 2: The average operating period of the country's active incubators is between 2 and 3 years.
- Grade 3: The average operating period of the country's active incubators is between 3 and 4 years.
- Grade 4: The average operating period of the country's active incubators is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no incubators in the country´s ICT entrepreneurial ecosystem that offer access to knowledge to entrepreneurs from the idea stage to the pre-seed stage.
- **On performance**: The incubators offer limited access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The incubators offer adequate access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The incubators offer optimal access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The incubators offer excellent access to knowledge to entrepreneurs from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Indicator 2.2. The quality of the accelerators.

Criteria 1: The estimated number of accelerators per million inhabitants.

To calculate the number of accelerators operating in the ICT ecosystem, the experts had access to the largest ICT entrepreneurial databases, Dealroom and CrunchBase. According to the databases, 106 accelerators are operating in the five selected East-Central European countries. The estimated number of accelerators per million inhabitants in the selected East-Central European countries is 1.22.

Graduation definition:

- Grade 0: Number of accelerators per million inhabitants in the country is 0.
- Grade 1: Number of accelerators per million inhabitants in the country is between 0.01 and 1.
- Grade 2: Number of accelerators per million inhabitants in the country is between 1.01 and 1.50.

- Grade 3: Number of accelerators per million inhabitants in the country is between 1.51 and 2.
- Grade 4: Number of accelerators per million inhabitants in the country is higher than 2.01.

Criteria 2: The average operating period of the country's active accelerators.

To calculate the operating period of the country's active accelerators, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's active accelerators is less than 2 years.
- Grade 2: The average operating period of the country's active accelerators is between 2 and 3 years.
- Grade 3: The average operating period of the country's active accelerators is between 3 and 4 years.
- Grade 4: The average operating period of the country's active accelerators is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no accelerators in the country´s ICT entrepreneurial ecosystem that offer access to knowledge to start-ups from the pre-seed stage to the seed stage.
- **On performance**: The accelerators offer limited access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The accelerators offer adequate access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The accelerators offer optimal access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The accelerators offer excellent access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Indicator 2.3. The existence of international accelerators operating in the country.

Criteria 1: The existence of international accelerators operating in the country.

To calculate the existence of international accelerators operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of international accelerators in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of international accelerators in the country.
- Grade 4: N/A.

Evaluation definition:

- **Non-existent**: There are no international accelerators in the country´s ICT entrepreneurial ecosystem that offer access to knowledge to start-ups from the pre-seed stage to the seed stage.
- **On performance**: The international accelerators offer limited access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The international accelerators offer adequate access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The international accelerators offer optimal access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

- **Excellent performance**: The international accelerators offer excellent access to knowledge to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Indicator 3.1. The existence of mentorship associations.

Criteria 1: The existence of mentorship associations operating in the country.

To calculate the existence of mentorship associations operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of mentorship associations in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of mentorship associations in the country.
- Grade 4: N/A.

Evaluation definition:

- **Non-existent**: There are no mentorship associations in the country´s ICT entrepreneurial ecosystem that offer access to knowledge to start-ups from the seed stage to the early stage.
- **On performance**: The mentorship associations offer limited access to knowledge to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The mentorship associations offer adequate access to knowledge to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The mentorship associations offer optimal access to knowledge to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The mentorship associations offer excellent access to knowledge to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Indicator 3.2. The existence of the private sector´s entrepreneurial programmes.

Criteria 1: The existence of the private sector´s entrepreneurial programmes operating in the country.

To calculate the existence of the private sector´s entrepreneurial programmes operating in the ICT ecosystem, the experts estimate the criteria in two grades.

Graduation definition:

- Grade 0: Non-existence of the private sector´s entrepreneurial programmes operating in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of the private sector´s entrepreneurial programmes operating in the country.
- Grade 4: N/A.

Evaluation definition:

- **Non-existent**: There are no private sector´s entrepreneurial programmes in the country´s ICT entrepreneurial ecosystem that offer access to knowledge to start-ups from the pre-seed stage to the early stage.
- **On performance**: The private sector´s entrepreneurial programmes offer limited access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

- **Acceptable performance**: The private sector´s entrepreneurial programmes offer adequate access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The private sector´s entrepreneurial programmes offer optimal access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The private sector´s entrepreneurial programmes offer excellent access to knowledge to start-ups from the pre-seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Indicator 4.1. The existence of crowdfunding platforms in the country.

Criteria 1: The existence of crowdfunding platforms operating in the country.

To calculate the existence of crowdfunding platforms operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of crowdfunding platforms in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of crowdfunding platforms in the country.
- Grade 4: N/A.

Evaluation definition:

- **Non-existent**: There are no crowdfunding platforms in the country´s ICT entrepreneurial ecosystem that offer access to capital to start-ups from the idea stage to the early stage.
- **On performance**: The crowdfunding platforms offer limited access to capital to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The crowdfunding platforms offer adequate access to capital to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The crowdfunding platforms offer optimal access to capital to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The crowdfunding platforms offer excellent access to capital to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Indicator 5.1. The quality of the local venture capital firms.

Criteria 1: The number of venture capital firms per million inhabitants.

To calculate the number of venture capital firms operating in the ICT ecosystem, the experts had access to the document "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern Partnership Countries" and the largest ICT entrepreneurial databases, dealroom.co and CrunchBase. According to the databases, 118 venture capital firms are operating in the five selected East-Central European countries. The estimated number of venture capital firms per million inhabitants in the selected East-Central European countries is 1.73.

Graduation definition:

- Grade 0: Number of venture capital firms per million inhabitants in the country is 0.
- Grade 1: Number of venture capital firms per million inhabitants in the country is between 0.01 and 1.
- Grade 2: Number of venture capital firms per million inhabitants in the country is between 1,01 and 1,50.
- Grade 3: Number of venture capital firms per million inhabitants in the country is between 1.51 and 2.

- Grade 4: Number of venture capital firms per million inhabitants in the country is higher than 2.01.

Criteria 2: The average number of investments per local venture capital firm from 2017 to 2020:

To calculate the local venture capital firms' average number of investments in the country, the experts had access to the document "Market Assessment for Digital Innovation and Scale-up Initiative in Eastern Partnership Countries" and the largest ICT entrepreneurial databases, dealroom.co and CrunchBase. According to the sources, 118 venture capital firms operating in the five selected East-Central European countries made 717 investments in local start-ups from 2017 to 2020. The investments rounds were:

3. Pre-seed stage: 176 investments
4. Seed-stage: 461 investments
5. Series A: 67 investments
6. Series B: 13 investments

The average number of investments per local venture capital firm in the selected East-Central European countries from 2017 to 2020 is 6.07.

Graduation definition:

- Grade 0: The average number of investments per local venture capital firm in the country from 2017 to 2020 is less than 1.
- Grade 1: The average number of investments per local venture capital firm in the country from 2017 to 2020 is between 1.01 and 3.
- Grade 2: The average number of investments per local venture capital firm in the country from 2017 to 2020 is between 3.01 and 6.
- Grade 3: The average number of investments per local venture capital firm in the country from 2017 to 2020 is between 6.01 and 10.
- Grade 4: The average number of investments per local venture capital firm in the country from 2017 to 2020 is higher than 10.01.

Criteria 3: The average operating period of the country's active venture capital firms.

To calculate the average operating period of the country's active venture capital firms, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's active venture capital firms is less than 2 years.
- Grade 2: The average operating period of the country's active venture capital firms is between 2 and 3 years.
- Grade 3: The average operating period of the country's active venture capital firms is between 3 and 4 years.
- Grade 4: The average operating period of the country's active venture capital firms is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no venture capital firms in the country´s ICT entrepreneurial ecosystem that offer access-to-capital to start-ups from the seed stage to the early stage.
- **On performance**: The venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The venture capital firms offer adequate access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

- **Optimal performance**: The venture capital firms offer optimal access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The venture capital firms offer excellent access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Indicator 5.2. The existence of international venture capital firms operating in the country.

Criteria 1: The existence of international venture capital firms operating in the country.

To calculate the existence of international venture capital firms operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of international venture capital firms in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of international venture capital firms in the country.
- Grade 4: N/A.

Evaluation definition:

- **Non-existent**: There are no international venture capital firms in the country´s ICT entrepreneurial ecosystem that offer access to capital to start-ups from the seed stage to the early stage.
- **On performance**: The international venture capital firms offer limited access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The international venture capital firms offer adequate access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The international venture capital firms offer optimal access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The international venture capital firms offer excellent access to capital to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Indicator 5.3. The quality of the business angels networks.

Criteria 1: The number of business angels networks per million inhabitants.

To calculate the number of business angel networks operating in the ICT ecosystem, the experts had access to the document “Market Assessment for Digital Innovation and Scale-up Initiative in Eastern Partnership Countries” and the largest ICT entrepreneurial databases, dealroom.co and CrunchBase. According to the databases, 10 business angel networks are operating in the five selected East-Central European countries.

Graduation definition:

- Grade 0: Non-existence of business angel networks in the country
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of business angel networks in the country.
- Grade 4: N/A.

Criteria 2: The average number of investments per local business angels network from 2017 to 2020.

To calculate the local business angel networks' average number of investments in the country, the experts had access to the document “Market Assessment for Digital Innovation and Scale-up Initiative in Eastern Partnership Countries” and the largest ICT entrepreneurial databases, dealroom.co and CrunchBase. According to the sources,

ten business angel networks operating in the five selected East-Central European countries made 182 investments in local start-ups from 2017 to 2020. The average number of investments per local business angels network in the selected East-Central European countries from 2017 to 2020 is 18.20. Also, 54 individuals (business angels) made 130 direct investments.

Graduation definition:

- Grade 0: The average number of investments per local business angels network in the country from 2017 to 2020 is less than 5.
- Grade 1: The average number of investments per local business angels network in the country from 2017 to 2020 is between 5.01 and 10.
- Grade 2: The average number of investments per local business angels network in the country from 2017 to 2020 is between 10.01 and 15.
- Grade 3: The average number of investments per local business angels network in the country from 2017 to 2020 is between 15.01 and 20.
- Grade 4: The average number of investments per local business angel network in the country from 2017 to 2020 is higher than 20.01.

Criteria 3: The average operating period of the country's active business angels networks.

To calculate the average operating period of the country's active business angel networks , the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's active business angels networks is less than 2 years.
- Grade 2: The average operating period of the country's active business angels networks is between 2 and 3 years.
- Grade 3: The average operating period of the country's active business angels networks is between 3 and 4 years.
- Grade 4: The average operating period of the country's active business angels networks is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no business angels networks in the country´s ICT entrepreneurial ecosystem that offer access to capital to start-ups from the pre-seed stage to the seed stage.
- **On performance**: The business angels networks offer limited access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The business angels networks offer adequate access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The business angels networks offer optimal access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The business angels networks offer excellent access to capital to start-ups from the pre-seed stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

Indicator 6.1. The existence of talent generation events.

Criteria 1: The existence of relevant talent generation events in the country.

To calculate the existence of relevant talent generation events operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of relevant talent generation events in the country
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of relevant talent generation events in the country.
- Grade 4: N/A.

Criteria 2: The average operating period of the country's active talent generation events.

To calculate the average operating period of the country's active talent generation events, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's talent generation events is less than 2 years.
- Grade 2: The average operating period of the country's talent generation events is between 2 and 3 years.
- Grade 3: The average operating period of the country's talent generation events is between 3 and 4 years.
- Grade 4: The average operating period of the country's talent generation events is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are talent generation events in the country´s ICT entrepreneurial ecosystem that offering access to knowledge to talented individuals.
- **On performance**: The talent generation events offer limited access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The talent generation events offer adequate access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The talent generation events offer optimal access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The talent generation events offer excellent access to knowledge to talented individuals in the country´s ICT entrepreneurial ecosystem.

Indicator 7.1. The quality of the entrepreneurial events

Criteria 1: The number of entrepreneurial events per million inhabitants.

To calculate the number of entrepreneurial events operating in the ICT ecosystem, the experts had access to the largest ICT entrepreneurial databases, dealroom.co and CrunchBase. The experts also had access to the database 10times, which includes the top multi-sectorial events in the world. According to the databases, 104 entrepreneurial events are held annually in the five selected East-Central European countries. The estimated number of entrepreneurial events per million inhabitants in the selected East-Central European countries is 1.52.

Graduation definition:

- Grade 0: Number of entrepreneurial events per million inhabitants in the country is 0.
- Grade 1: Number of entrepreneurial events per million inhabitants in the country is between 0.01 and 1.
- Grade 2: Number of entrepreneurial events per entrepreneurial events in the country is between 1,01 and 1,50.
- Grade 3: Number of entrepreneurial events per entrepreneurial events in the country is between 1.51 and 2.
- Grade 4: Number of entrepreneurial events per entrepreneurial events in the country is higher than 2.01.

Criteria 2: The average estimated number of attendees per entrepreneurial event

To estimate the average number of attendees, the experts selected the top 8 most relevant entrepreneurial events for start-ups, excluding macro events (see table below), and calculated an average number of attendees. The average number of attendees per entrepreneurial event in the selected East-Central European countries is 2,200.

Table 142. List of entrepreneurial events in the East-Central European countries

Name of entrepreneurial event	Number of participants in 2019
Budapest Tech Week	4500
Latitude 59	2500
Investors.BG	700
Sektor 3.0 Festival	500
Wolves Summit	1500
Startup Fair Lithuania	1500
Digital Dragons	2000
Startup Day	4400
Webit Festival	15000

Graduation definition:

- Grade 0: The average number of attendees per entrepreneurial event in the country is less than 200.
- Grade 1: The average number of attendees per entrepreneurial event in the country is between 201 and 1,000.
- Grade 2: The average number of attendees per entrepreneurial event in the country is between 1,001 and 2,000.
- Grade 3: The average number of attendees per entrepreneurial event in the country is between 2,001 and 3,000.
- Grade 4: The average number of attendees per entrepreneurial event in the country is higher than 3,000.

Criteria 3: The average operating period of the country's active entrepreneurial events.

To calculate the average operating period of the country's active entrepreneurial events, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The country's entrepreneurial events average operating period is less than 2 years.
- Grade 2: The country's entrepreneurial events average operating period is between 2 and 3 years.
- Grade 3: The country's entrepreneurial events average operating period is between 3 and 4 years.
- Grade 4: The country's entrepreneurial events average operating period is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no entrepreneurial events in the country´s ICT entrepreneurial ecosystem that offer access to market to start-ups from the idea stage to the seed stage.
- **On performance**: The entrepreneurial events offer limited access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.

- **Acceptable performance**: The entrepreneurial events offer adequate access to market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The entrepreneurial events offer optimal access to the market to start-ups from the idea stage to the seed stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The entrepreneurial events offer excellent access to market to start-ups from the idea stage to the seed stage, in the country´s ICT entrepreneurial ecosystem.

Indicator 7.2. The existence of specialised entrepreneurial media and databases of the ICT entrepreneurial ecosystem

Criteria 1: The existence of specialised entrepreneurial media in the country.

To calculate the existence of specialised entrepreneurial media operating in the ICT Ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of specialised entrepreneurial media in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of specialised entrepreneurial media in the country.
- Grade 4: N/A.

Criteria 2: The existence of relevant ICT entrepreneurial ecosystem databases.

To calculate the existence of relevant ICT entrepreneurial ecosystem databases operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of relevant ICT entrepreneurial ecosystem databases in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of relevant ICT entrepreneurial ecosystem databases in the country.
- Grade 4: N/A.

Criteria 3: The average operating period of the country's active specialised entrepreneurial media and databases.

To calculate the average operating period of the country's active specialised entrepreneurial media and databases, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's specialised entrepreneurial media and databases is less than 2 years.
- Grade 2: The average operating period of the country's specialised entrepreneurial media and databases is between 2 and 3 years.
- Grade 3: The average operating period of the country's specialised entrepreneurial media and databases is between 3 and 4 years.
- Grade 4: The average operating period of the country's specialised entrepreneurial media and databases is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no specialised entrepreneurial media and databases in the country´s ICT entrepreneurial ecosystem that offer access to market to start-ups from the idea stage to the early stage.
- **On performance**: The specialised entrepreneurial media and databases offer limited access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The specialised entrepreneurial media and databases offer adequate access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The specialised entrepreneurial media and databases offer optimal access to the market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The specialised entrepreneurial media and databases offer excellent access to market to start-ups from the idea stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Indicator 8.1. The existence of investment forums.

Criteria 1: The existence of investment forums in the country.

To calculate the existence of investment forums operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of investment forums in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of investment forums in the country.
- Grade 4: N/A.

Criteria 2: The average operating period of the country's active investment forums.

To calculate the average operating period of the country's active investment forums, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's investment forums is less than 2 years.
- Grade 2: The average operating period of the country's investment forums is between 2 and 3 years.
- Grade 3: The average operating period of the country's investment forums is between 3 and 4 years.
- Grade 4: The average operating period of the country's investment forums is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no investment forums in the country´s ICT entrepreneurial ecosystem that offer access to market to start-ups from the seed stage to the early stage.
- **On performance**: The investment forums offer limited access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The investment forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The investment forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The investment forums offer excellent access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Indicator 8.2. The existence of national trade fairs and business forums.

Criteria 1: The existence of national trade fairs and business forums in the country.

To calculate the existence of national trade fairs and business forums operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of national trade fairs and business forums in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of national trade fairs and business forums in the country.
- Grade 4: N/A.

Criteria 2: The average operating period of the country's active national trade fairs and business forums.

To calculate the average operating period of the country's active national trade fairs and business forums, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's national trade fairs and business forums is less than 2 years.
- Grade 2: The average operating period of the country's national trade fairs and business forums is between 2 and 3 years.
- Grade 3: The average operating period of the country's national trade fairs and business forums is between 3 and 4 years.
- Grade 4: The average operating period of the country's national trade fairs and business forums is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no national trade fairs and business forums in the country´s ICT entrepreneurial ecosystem that offer access to market to start-ups from the seed stage to the early stage.
- **On performance**: The national trade fairs and business forums offer limited access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The national trade fairs and business forums offer adequate access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The national trade fairs and business forums offer optimal access to the market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The national trade fairs and business forums offer excellent access to market to start-ups from the seed stage to the early stage in the country´s ICT entrepreneurial ecosystem.

Indicator 9.1. The quality of tech facilities to support the start-up creation.

Criteria 1: The number of tech facilities per million inhabitants.

To calculate the number of tech facilities operating in the ICT ecosystem, the experts had access to the largest ICT entrepreneurial databases, Dealroom and CrunchBase. According to the databases, 90 tech facilities are operating in the five selected East-Central European countries. The estimated number of tech facilities per million inhabitants in the selected East-Central European countries is 1.32.

Graduation definition:

- Grade 0: Number of tech facilities per million inhabitants in the country is 0.

- Grade 1: Number of tech facilities per million inhabitants in the country is between 0.01 and 0.70.
- Grade 2: Number of tech facilities per million inhabitants in the country is between 0.71 and 1.30.
- Grade 3: Number of tech facilities per million inhabitants in the country is between 1.31 and 2.
- Grade 4: Number of tech facilities per million inhabitants in the country is higher than 2.01.

Criteria 2: The average number of annually founded spin-offs per tech facility:

To calculate the average number of annually founded spin-offs per tech facility in the country the experts had access to the largest ICT entrepreneurial databases, dealroom.co and CrunchBase. According to the sources, 550 spin-offs were founded by 68 of 90 tech facilities from 2017 to 2020 in the five selected East-Central European countries. The average number of annually founded spin-offs per tech facility in the selected East-Central European countries from 2017 to 2020 is 2.03.

Graduation definition:

- Grade 0: The average number of annually founded spin-offs per tech facility in the country from 2017 to 2020 is 0.
- Grade 1: The average number of annually founded spin-offs per tech facility in the country from 2017 to 2020 is between 0.01 and 1.
- Grade 2: The average number of annually founded spin-offs per tech facility in the country from 2017 to 2020 is between 1.01 and 2.
- Grade 3: The average number of annually founded spin-offs per tech facility in the country from 2017 to 2020 is between 2.01 and 3.
- Grade 4: The average number of annually founded spin-offs per tech facility in the country from 2017 to 2020 is higher than 3.01.

Criteria 3: The average operating period of the country's active tech facilities.

To calculate the average operating period of the country's active tech facilities, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country's active tech facilities is less than 2 years.
- Grade 2: The average operating period of the country's active tech facilities is between 2 and 3 years.
- Grade 3: The average operating period of the country's active tech facilities is between 3 and 4 years.
- Grade 4: The average operating period of the country's active tech facilities is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no tech facilities in the country´s ICT entrepreneurial ecosystem that offer access to resources to start-ups from the idea stage to the pre-seed stage.
- **On performance**: The tech facilities offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The tech facilities offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The tech facilities offer optimal access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The tech facilities offer excellent access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Indicator 9.2. The existence of tech facilities to support the start-up creation in small urban and rural areas.

Criteria 1: The existence of tech facilities operating in the country's in small urban and rural areas.

To calculate the existence of tech facilities operating in small urban and rural areas in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of tech facilities in small urban and rural areas in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of tech facilities in small urban and rural areas in the country.
- Grade 4: N/A.

Evaluation definition:

- **Non-existent**: There are no tech facilities in small urban and rural areas in the country´s ICT entrepreneurial ecosystem that offer access to resources to start-ups from the idea stage to the pre-seed stage.
- **On performance**: The tech facilities in small urban and rural areas offer limited access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The tech facilities in small urban and rural areas offer adequate access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The tech facilities in small urban and rural areas offer optimal access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The tech facilities in small urban and rural areas offer excellent access to resources to start-ups from the idea stage to the pre-seed stage in the country´s ICT entrepreneurial ecosystem.

Indicator 10.1. The existence of business facilities to support the start-up development.

Criteria 1: The existence of business facilities in the country.

To calculate the existence of business facilities operating in the ICT ecosystem, the experts estimate the two grades criteria.

Graduation definition:

- Grade 0: Non-existence of business facilities in the country.
- Grade 1: N/A.
- Grade 2: N/A.
- Grade 3: Existence of business facilities in the country.
- Grade 4: N/A.

Criteria 2: The average operating period of the country’s active business facilities.

To calculate the average operating period of the country’s active business facilities, the experts estimate that a stakeholder becomes professional from the third year and fully optimised from the fourth year.

Graduation definition:

- Grade 1: The average operating period of the country’s business facilities is less than 2 years.
- Grade 2: The average operating period of the country’s business facilities is between 2 and 3 years.
- Grade 3: The average operating period of the country’s business facilities is between 3 and 4 years.

- Grade 4: The average operating period of the country's business facilities is higher than 4 years.

Evaluation definition:

- **Non-existent**: There are no business facilities in the country´s ICT entrepreneurial ecosystem that offer access to resources to start-ups from seed stage to scale-ups.
- **On performance**: The business facilities offer limited access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.
- **Acceptable performance**: The business facilities offer adequate access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.
- **Optimal performance**: The business facilities offer optimal access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.
- **Excellent performance**: The business facilities offer excellent access to resources to start-ups from seed stage to scale-ups in the country´s ICT entrepreneurial ecosystem.