



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Project of the Republic of Azerbaijan

Project number:	SAP 190 347
Project title:	Development of an innovation ecosystem and support infrastructure, including a Digital Education and Innovation Centre in Azerbaijan HC2 (Advancing Economic Competitiveness)
Thematic area code	HC21 (Investment, Technology, and SME development)
Starting date:	1 January 2020
Duration:	15 months (tbc)
Project site:	Azerbaijan
Government	Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan
Co-ordinating agency:	Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan
Counterpart:	Innovation Agency (tbc)
Executing agency/ cooperating agency:	
Project Inputs:	EUR 175,000
- UNIDO inputs:	
- Support costs (13 %):	EUR 22,750
- Coordination levy (1%):	EUR 1,977.50
Counterpart inputs	
- Grand Total:	EUR 199,725.50

Brief description:

The Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan in its letter, dated 1 August 2019, requested UNIDO support in acquiring and sharing knowledge, experience, and best practices for promoting innovation ecosystem building, and support infrastructure for enhancing the competitiveness and innovation of enterprises in Azerbaijan. Following UNIDO consultations with the representatives of the Ministry of Economic Development and Technology of Slovenia, Ljubljana Technology Park (PTP) and Slovenian Institute of Quality and Metrology, and the Permanent Mission of Slovenia, of 11 September 2019, at UNIDO HQ, the Slovenian government expressed the interest to fund the proposed project.

The project objective is innovation ecosystem building, including fostering an environment for StartUp and ScaleUp and skill upgrading, as well as raising awareness of the opportunities and challenges of the fourth industrial revolution (4IR) for pursuing Inclusive and Sustainable Industrial Development (ISID) in Azerbaijan.

The project will establish a Digital Education and Innovation Centre (DEIC) for fostering 4IR technological learning and innovation, through the provision of training and raising awareness on the

opportunities and challenges of 4IR for innovation, entrepreneurship and competitiveness in middle-income countries.

The project contributes to the envisaged Sustainable Development Goals (SDGs), in particular, SDG 9 (Build resilient infrastructure, promote sustainable industrialization and foster innovation) and SDG 8 (Promote inclusive and sustainable economic growth, employment and decent work for all).

Approved:

Signature:

Date:

Name and title:

On behalf of
MDIC:

On behalf of
UNIDO:

A. CONTEXT

A.1 BACKGROUND

We are in the midst of the fourth industrial revolution (4IR). Rapid advances in advanced digital technologies and systems (such as artificial intelligence-AI; machine learning-ML; robotics; additive manufacturing, or 3D printing; the Internet of Things-IoT; distributed-ledger technology-DLT or blockchain; quantum computing; and cyber-physical-systems-CPS) and their convergence with nanotechnology, biotechnology and cognitive, social and humanitarian sciences (known as convergent technologies) are driving the 4IR forward. These technologies are innovative, fast growing, deeply interconnected and interdependent, and are also referred to as frontier technologies.

The 4IR is leading to a paradigm shift that is profoundly altering how we work, innovate, live, and interact. In comparison to previous industrial revolutions, the 4IR is the fastest period of innovation ever. Innovation is becoming more complex, multidisciplinary, collaborative, unplanned, unpredictable and disruptive. It is developing at an exponential rather than linear pace. The implications will be widespread and systemic, causing structural changes in the economy and society. Digital and convergent technologies are merging the physical, digital and biological worlds, affecting all socio-economic sectors and scientific disciplines, and blurring the differences between them. All countries will be affected.

The 4IR demands new skills and competencies, such as complex problem solving, data analytics, creativity, social communication, adaptability and continuous learning of new skills and approaches. Consequently, the 4IR will accelerate demand for new specialists such as in data management, AI and machine learning, big data analytics, process automation, information security, human-machine interaction, design, robotics and blockchain. The speed of advancement in new technologies and their increasing interconnectedness and interdependence demand a more proactive response from the educational sector than received during earlier industrial revolutions.

The capability to innovate, develop, implement and integrate 4IR technologies and technological systems to specific industry conditions and country contexts, along with the willingness to regularly re-skill and up-skill the workforce will be crucial. All countries will need to adopt a systemic approach to technological learning and innovation, and skill development and upgrading to ensure a smooth transformation to the 4IR. Consequently, the demand for reforms in Technical, Vocational Education and Training (TVET) systems will increase. In many developing countries, TVET institutions are unable to adapt their training to the needs of the 4IR, and the private sector, forerunner of 4IR, is insufficiently involved in developing and updating TVET curricula.

4IR technologies are creating opportunities to realize economic, social and environmental gains and achieve the Sustainable Development Goals (SDGs). The economic benefits of the adoption of 4IR technologies and business models result from an increase in revenues owing to lower operating costs, improved manufacturing process control, more reliable manufacturing, and higher productivity, product quality and customer involvement in the production process. The environmental benefits of 4IR technologies include greater resource efficiency and effectiveness, wider access to electricity and water, and reduced emissions of greenhouse gases and other pollutants. They have the potential to contribute to environmental efficiency and effectiveness through circular economy business models that consume renewable material resources and keep materials from finite stocks in an infinite loop. The social benefits of 4IR include: improvements in human cognition, health and physical capabilities; better food security and safety; better healthcare; enhancements in creativity and innovation; better access to food, sustainable energy; creation of a knowledge society; and better opportunities for disadvantaged and vulnerable population groups, as well as small and medium-sized enterprises (SMEs), to participate in the real economy.

Alongside these benefits, there are multiple challenges and risks. These include threats of a growing demand for energy and certain precious materials; technology gap between countries widening; job losses and rising unemployment for some workers; slow institutional changes (in norms, standards, regulations); cyber security threats to industrial security; ethical issues; and threats to global peace and security arising from the military uses of new technologies.

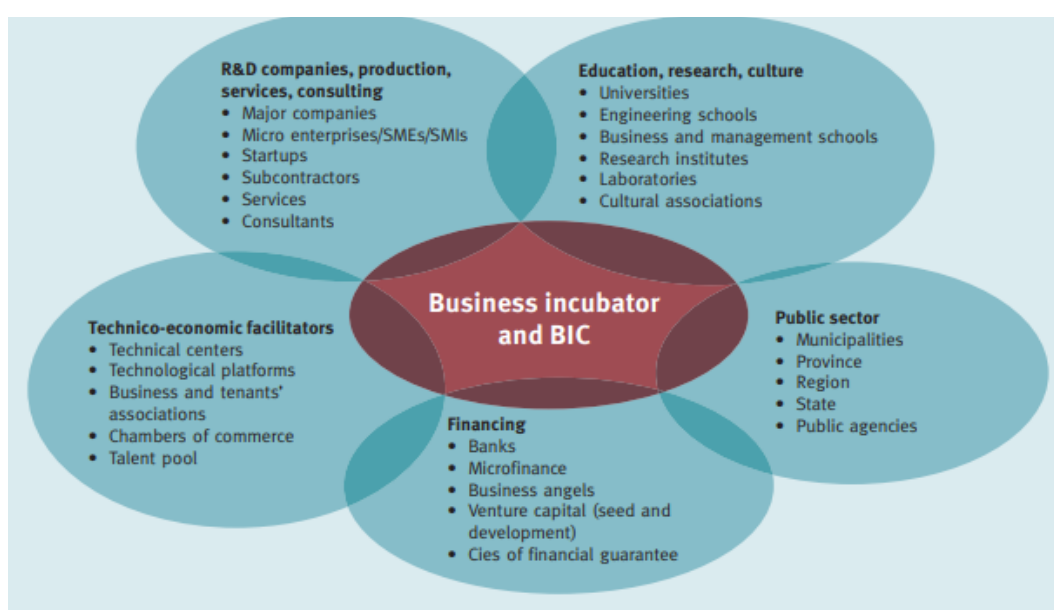
Despite the rising affordability of 4IR technologies, they do not diffuse evenly across countries because of low absorptive capacities to benefit from affordable 4IR knowledge and technologies in some countries. Countries with high capabilities in science, technology and innovation (STI), as well as in institutional adaptations, will be the first to reap the benefits of breakthroughs in 4IR technologies.

Consequently, the technological and institutional gap between countries will widen. Even developed countries with advanced capabilities in STI and institutions will find it difficult to sustain their global competitiveness, as the geography of innovation shifts from high-income (HICs) to middle-income economies (MICs), such as China.

Moving from successful MICs with innovation potential to an innovation powerhouse remains difficult. Challenges to be addressed by MICs are manifold. Many MICs have an inadequate structure of human capital formation and low levels of innovation, R&D and technology absorption. Their institutions are weak and systemic opportunities for interactive learning are largely absent. There is a lack of industry-academia collaborations and public-private partnerships in research and development (R&D); business environments are not conducive to technological learning, innovation and inclusiveness towards disadvantaged and vulnerable population groups (women, youth, people with disabilities, indigenous populations and ethnic minorities) and SMEs; and an embedded approach to industrial governance is weak or absent. The primary barrier to SMEs' transition to 4IR is the lack of soft and hard infrastructure (traditional and modern, such as in IT) required for innovation. Inadequate information and awareness, finance, communication and innovation technology infrastructure, skilled workforce and supportive government policies are the key impediments. Upgrading and developing skills and knowledge are required to meet the demands of the 4IR for new qualifications and remote, flexible and on-demand work.

These conditions put many MICs far behind HICs in pursuing an innovation ecosystem approach. In an innovation ecosystem (Figure 1), all actors, including SMEs and their clusters in special economic zones, industrial and technology parks work cooperatively and competitively to support new products, satisfy individual customer needs or solve social problems. They work together to incorporate the next round of innovations, which are beyond the capacity of any single organization—or even any traditional industry. Their diversity and collective ability to learn, adapt and, most importantly, to innovate together—are key determinants of their longer-term success. They engage in international collaboration in global value chains and innovation networks, and compete on a global scale, thus creating forward and backward linkages in value chains (national, regional and global).

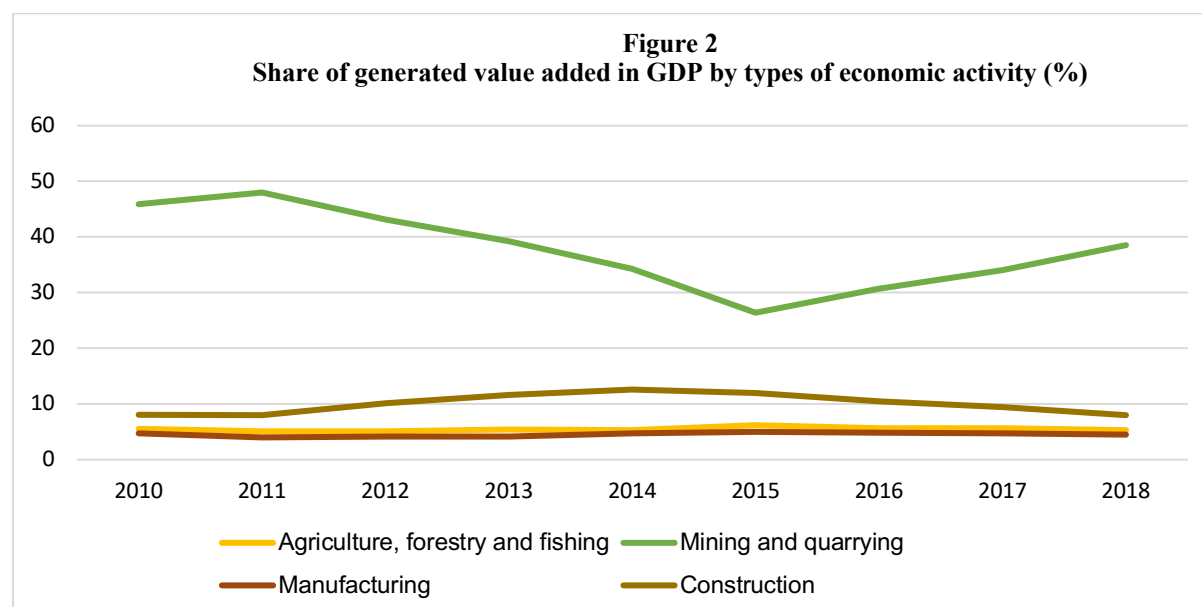
Figure 1 Innovation ecosystem schematic



A.2. COUNTRY CONTEXT

Azerbaijan is an upper middle-income and resource-rich country (see Table 1). The country has made progress in socioeconomic development, ever since its independence in the early 1990s. The economic growth of Azerbaijan is dependent on the oil sector, which comprised 43% of total GDP in 2017 (Figure 2). After a recession in 2016–17, real GDP growth recovered in 2018, driven by higher oil prices, and reached 1.4%. Growth in the non-oil sector was boosted by manufacturing growth, which strengthened by 7.9% in 2018. In 2017, the ICT sector generated revenue of AZN 1.038 million (approx. US \$610

million), or 1.5% of GDP (2.2% of non-oil GDP).¹ Medium hi-tech and hi-tech industries make up 13.7% of the manufacturing value added in Azerbaijan's economy. According to official statistics, real GDP grew by 2.5% year on year in the first half of 2019, accelerating from 0.2% in the respective period of the previous year. The acceleration was supported by the hydrocarbons sector as well as non-oil GDP growth, supported by a favourable monetary policy². Industrial production (dominated by the hydrocarbons sector) grew by 2.2%, compared with 0.7% in the respective period of the previous year.



Source: The State Statistical Committee of the Republic of Azerbaijan

In 2017, Azerbaijan ranked below Armenia, Belarus, Kazakhstan, and Russia among the CIS countries in the UNIDO Competitive Industrial Performance Index (Table 1). The CIP Index covers three main dimensions, each consisting of two indicators. These dimensions are: i) the capacity to produce and export manufactured goods, ii) technological deepening and upgrading, and iii) world impact. The higher the scores in any of the three dimensions, the higher the country's CIP Index.

Table 1 UNIDO Competitive Industrial Performance Index.

Country	Income classification by the World Bank *	UNIDO Competitive Industrial Performance (CIP) Index		
		Rank in 2017	2017 Indicator (0-1)	Rank in 2016
Azerbaijan	Upper middle income	115	0.009	107
Belarus	Upper middle income	46	0.067	47
Kazakhstan	Upper middle income	66	0.037	69
Kyrgyzstan	Lower middle income	118	0.008	121
Armenia	Upper middle income	99	0.013	99
Moldova	Lower middle income	106	0.01	110
Russia	Upper middle income	31	0.109	32
Tajikistan	Low income	129	0.004	133

*The World Bank classification, 2020

<https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

¹ <https://www.azstat.org/MESearch/details?lang=en&type=2&id=444&departament=20>

² Economist Intelligence Unit http://country.eiu.com/FileHandler.ashx?issue_id=708397254&mode=pdf

The Global Competitiveness Index 4.0 of the World Economic Forum, maps the factors and attributes driving productivity, growth and human development in the 4IR era for 141 economies accounting for 99% of the world's GDP.³ It ranked the Russian Federation (43rd) on top of Eurasia's competitiveness rankings (43rd), followed by Kazakhstan (55th) and Azerbaijan (58th) (Figure 3)—both improving their performance over 2018.

Fostering innovation capability would help Azerbaijan to achieve a higher competitiveness performance and advance the process towards structural change in the 4IR era.

Striving for a future of sustainable growth, the Government of Azerbaijan has prioritized following thematic areas in the government's strategic planning the modernization of the oil and gas sector; the petrochemical industry upgrading; industrial and economic diversification; alternative and renewable energy sources; expansion of trade in goods and services; and transformation towards a knowledge-based and innovation-driven economy (Figure 4).⁴

Figure 3 Competitiveness Index Rankings

Rank	Economy	Score ¹	Diff. from 2018 ²	
			Rank	Score
48	Mexico	64.9	-2	+0.3
49	Bulgaria	64.9	+2	+1.3
50	Indonesia	64.6	-5	-0.3
51	Romania	64.4	+1	+0.9
52	Mauritius	64.3	-3	+0.5
53	Oman	63.6	-6	-0.8
54	Uruguay	63.5	-1	+0.8
55	Kazakhstan	62.9	+4	+1.1
56	Brunei Darussalam	62.8	+6	+1.3
57	Colombia	62.7	+3	+1.1
58	Azerbaijan	62.7	+11	+2.7
59	Greece	62.6	-2	+0.5
60	South Africa	62.4	+7	+1.7
61	Turkey	62.1	—	+0.5
62	Costa Rica	62.0	-7	-0.1
63	Croatia	61.9	+5	+1.8
64	Philippines	61.9	-8	-0.3
65	Peru	61.7	-2	+0.4
66	Panama	61.6	-2	+0.6
67	Viet Nam	61.5	+10	+3.5
68	India	61.4	-10	-0.7
69	Armenia	61.3	+1	+1.4
70	Jordan	60.9	+3	+1.6

Figure 4 Moving from factor driven to innovation driven economy



Innovation policy in Azerbaijan

Innovation and/or innovative growth is a vital part of a number of state programmes, as well as legal and regulatory acts of the Republic of Azerbaijan. The term 'Innovation' is defined in the state law on Education as 'progressive novelties developed based on various institutions, scientific researches'.⁵ The main approaches of the state innovation policy of the Republic of Azerbaijan are described in the Law on 'Science' adopted in 2016.⁶ The Law includes several principles on the direction of state policy in the field of organization, management and development of scientific and innovation activities. It also

³ WEF, 2019, World Competitiveness Report.

⁴ Economist Intelligence Unit. Country Report. November 2014

⁵ <http://edu.gov.az/az/page/72/302>

⁶ http://science.gov.az/uploads/PDF/Elm_haqqinda_Azərbaycan_Respublikasının_Qanunu.pdf

envisages the identification of strategic directions for the development and improvement of the state innovation policy.⁷

The President of Azerbaijan approved major strategic roadmaps for the national economy and for its 11 key sectors on 6 December 2016. The Strategic Road Map on the National Economic perspectives comprises an economic development concept and action plan for 2016–2020, a long-term outlook until 2025, and a broader outlook for the period beyond 2025.⁸ The policy is largely sector-specific and in general, includes an innovation component.

The Road Map for the national economy includes the action on “promoting the education-research-innovation way of development in higher education institutions” to stimulate the effectiveness of the ‘education-research-innovation’ environment through university clusters.⁹ Furthermore, the Road Map contains actions to stimulate the development of a knowledge-based society founded on the development of scientific research activities and it encourages investments in innovation, as well as improvement of infrastructure to develop human capital in the country. In this context, the government plans the development of an innovation strategy, with the purpose to establish innovative clusters, and facilitate the digital transformation and the development of an e-government system.¹⁰

Considering innovation governance, the innovation component is featuring in legal and regulatory acts listed below.

- State Strategy on the development of education in the Republic of Azerbaijan
- National Strategy for the development of Information society during 2014–2020
- Azerbaijan 2020: Look into the Future” Concept of Development
- State Program for the development of industry in the Republic of Azerbaijan for 2015–2020
- National Strategy on High Technology (2020–2025)

The Innovation Agency is also established under the Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan, based on the State Fund for Development of Information Technologies and the High-Tech Park Limited Liability Company, in accordance with the Decree № 325 of President of the Republic of Azerbaijan Ilham Aliyev dated 6 November 2018. The Agency assists local businesses in acquiring modern technologies, organizes their transfer, supports innovation-oriented scientific research and encourages innovative projects, including start-ups by funding them through grants, concessional loans and venture capital funds.

The Innovation Agency goal is to promote the production of innovative and high-tech products and to provide services under the “*Made in Azerbaijan*” brand; creating conditions for existing local brands to enter international markets; identifying products and services for digital transformation; supporting advanced digital technologies (robotics, CPS, big data analytics; and AI). The Agency also has a Business Incubation and Acceleration Centre to support the ideas of young people, to form a base of innovative ideas, as well as to develop and improve innovative products and high technologies. The Business Incubation operates 24 hours a day, 7 days a week¹¹.

There are ongoing international and national initiatives aimed at strengthening and broadening Azerbaijan’s innovation ecosystem, where all stakeholders involved embrace new technologies and business models. These initiatives include the Centre for Sustainable and Operational Social Security

⁷ Article 4 of the Law envisages that the state policy on the scientific innovation is implemented along the following directions: a) identification of the strategic directions for the development and improvement of the state innovation policy; b) creation of favourable terms for financing innovation projects, attracting and promoting investments; c) establishment of scientific innovation subjects –integrative science, education and entrepreneurship centres, techno-polis , scientific and technology parks, technological incubators, innovation funds, and information databases on innovations; d) establishment of high-tech based production areas, supply of market and entry to foreign markets; e) study of innovative development practice and its use in the preparation of development strategy.

⁸http://ereforms.org/store/media/ekspert_yazilari/islahat%20icmali/mart/strateji%20yol%20x%C9%99rit%C9%99si%20-eng1.pdf

⁹ “The establishment of university clusters will stimulate the implementation of researches and improvements and the application of the scientific results to the production, and hence the efficiency of the ‘education-science-production’ relations will be improved”

¹⁰ <https://menafn.com/1098703867/Minister-talks-on-plans-to-create-ICT-innovation-clusters-in-Azerbaijan>

¹¹ <http://www.mincom.gov.az/en/view/organization/16/>

—DOST; Accelerator Labs; InnoLand Innovation and Incubation centre; Social Innovation Lab; Cleantech Ideation Bootcamp; and the first robotics lab for children in Baku¹².

Challenges ahead: the level of innovation activity remains low

Despite the importance given to innovation in the current legislation, the level of innovation activity and performance of Azerbaijan remains low and requires rapid improvement. The level of expenditures on research and development (R&D) at present is around 0.19% of GDP, which is significantly lower compared with the world average and most of the countries in the region. For comparison, the level in the Russian Federation is 1.1 % and in Ukraine is around 0.45%.

Azerbaijan is analyzed on how well it is positioned for shaping and benefiting from the changing nature of production in the era of 4IR, by the WEF Readiness for the Future of Production Assessment (Figure 5). This measurement has two main components. One component is the structure of production at which Azerbaijan's score was 2.2 out of 10 possible points, ranking the country 95 (out of 100) in 2018. The second component is the drivers of production, which positioned the country on rank 62 (score of 4.7).

When looking at the driver Technology and Innovation, in particular, Azerbaijan's score accounted for 4.1, which ranked the country in 55th place. Its score for the ability to innovate was 2 out of 10 and the score for the technology platform, on the other hand, was higher accounting for 6.2. Against this background, the country is classified as nascent, or among those countries least ready for the future of production by the World Economic Forum (Figure 6).¹³

Figure 5 Archetype of Azerbaijan's Readiness for the Future of Production Ranking 2018



Source: WEF Readiness for the Future of Production Report 2018

Figure 6

Readiness for the Future of Production Assessment 2018 Driver: Technology & Innovation

Index Component	Rank /100	Value
Driver: Technology & Innovation 0-10 (best)	55	4.1
Technology Platform 0-10 (best)	49	6.2
2.01 Mobile-cellular telephone subscriptions /100 pop.	75	106.3
2.02 LTE mobile network coverage % population	79	41.0
2.03 Internet users % pop.	31	78.2
2.04 FDI and technology transfer 1-7 (best)	27	5.0
2.05 Firm-level technology absorption 1-7 (best)	40	4.9
2.06 Impact of ICTs on new services and products 1-7 (best)	39	5.0
2.07 Cybersecurity commitment 0-1 (best)	51	0.6
Ability to Innovate 0-10 (best)	66	2.0
2.08 State of cluster development 1-7 (best)	32	4.3
2.09 Company investment in emerging technology 1-7 (best)	20	4.7
2.10 Gov't procurement of advanced technology products 1-7 (best)	11	4.3
2.11 Companies embracing disruptive ideas 1-7 (best)	21	4.2
2.12 Multi-stakeholder collaboration 1-7 (best)	24	4.4
2.13 R&D expenditures % GDP	80	0.2
2.14 Scientific and technical publications Number per Billion PPP\$ GDP	85	3.2
2.15 Patent applications applications/million pop.	78	0.15
2.16 Venture capital deal volume US\$ millions	96	42.9
2.17 Venture capital deal volume per size of economy US\$/GDP	97	0.8

Source: WEF Readiness for the Future of Production Report 2018

¹² <http://www.az.undp.org/content/azerbaijan/en/home.html>

¹³ http://www3.weforum.org/docs/FOP_Readiness_Report_2018.pdf

ICT Sector development in Azerbaijan¹⁴

The Ministry of Transport, Communication and High Technologies (MTCHT) is responsible for both ICT policy and regulation. Its remit is broad, covering telecommunication, information technology, and postal services, as well as transport and oversight over several telecommunication operators.

In terms of policy, the President approved a strategic ICT road map that outlines 3 key strategies and 10 priorities, with achievement targeted for 2020. Implementation will be critical to address shortcomings in the sector that are constraining development of the digital economy. The implementing cost of the road map has been budgeted at AZN585 million, with funding in partnerships between the government, private sector (including foreign investment), as well as bilateral and multilateral partners.

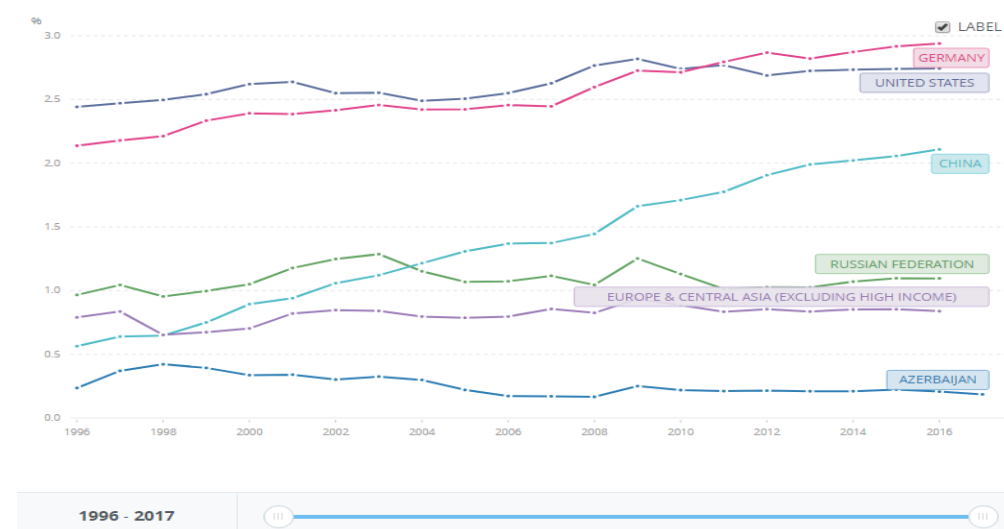
The value added by the ICT sector, which includes publishing, broadcasting, telecommunication, and computer and information services, made up 2.2% of non-oil GDP in 2017. Azerbaijan's ICT sector generated revenue of US\$610m in 2017, or 1.5% of total GDP.

Employment in the ICT sector totaled 61,700 persons and accounted for 1.3% of employment. Telecommunication accounted for 88% of total sector revenue, suggesting that Azerbaijan has yet to exploit its existing hard infrastructure through a vibrant computer and information service industry.

Although the sector has grown since 2010, the growth rate has been less than that of the overall economy; consequently, its share of GDP has declined. The ICT sector dominated by the telecommunication services and low growth rates presents a challenge to the government's aspirations for sector revenues to surpass those of oil.

Most of the R&D funding in Azerbaijan (around 80% in 2011) originates in the public sector, whereas the business sector (even in the presence of the strong FDI-dominated oil and gas sector) provides only about 20% of the funding (Figure 7).

Figure 7 Research and development expenditure (% of GDP)



Azerbaijan's score on the Global Innovation Index (GII), which is the simple average of the Input and Output Sub-Index scores, was low compared to other countries in the region. In 2019, the GII of Azerbaijan was 30.2, which ranked Azerbaijan only in 84th place out of 129 countries¹⁵.

In recent years, major steps have been taken by the government to improve innovation activity and the commercialization of science and research in the country, including the establishment of a number of techno-parks and agencies, such as the innovation agency and the agency for Public Service and Social Innovations (ASAN Service). ASAN (which translates as 'easy' in Azerbaijani) is the country's one-stop-shop solution for effective and transparent public service delivery, which received the UN Public

¹⁴ <https://www.adb.org/sites/default/files/institutional-document/484586/aze-digital-development-overview.pdf>

¹⁵ https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf

Service Award in 2015.

Doing Business in Azerbaijan

The World Bank placed Azerbaijan under the 10 economies worldwide that show major improvement in the performance of the Doing Business indicators in 2017/18. The country implemented eight business regulatory reforms making it easier to do business. Among other things, Azerbaijan facilitated dealing with construction permits; facilitated a more reliable power supply; made registering property easier; strengthened access to credit and legal rights of borrowers and lenders; facilitated trade across borders; and strengthened legal and economic institutions.¹⁶ In doing so, Azerbaijan has been tackling key challenges of developing a diversified economy and, embracing opportunities and overcome challenges raised by 4IR.

A.3. PROJECT ORIGIN

The Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan, requested UNIDO's support in acquiring and sharing knowledge and experience, as well as best practices, to promote innovation ecosystem building and enhance competitiveness of innovative enterprises in Azerbaijan in the era of 4IR in its letter dated 1 August 2019 (see Annex II).

Following UNIDO consultations with the representatives of the Ministry of Economic Development and Technology of Slovenia, Ljubljana Technology Park (PTP) and Slovenian Institute of Quality and Metrology, and the Permanent Mission of Slovenia, of 11 September 2019, at UNIDO HQ, the Slovenian government expressed the interest to fund the proposed project.

A.4. TARGET BENEFICIARIES

Target beneficiaries of the project are representatives of governments at various levels; industry associations; and intermediary organizations and institutions, such as extension service providers, industrial R&D centres, research centres, cluster organizations and academia, and educational institutions from Azerbaijan.

B. REASONS FOR UNIDO ASSISTANCE

The UNIDO mandate is to assist countries to achieve inclusive and sustainable industrial development (ISID). The concept of ISID is closely aligned with the 2030 Agenda for Sustainable Development and its associated Sustainable Development Goals (SDGs), the development framework that seeks to transform our world and guide all global, regional and national development endeavours up to 2030.

The UNIDO mandate of fostering ISID is based on the recognition by its Member States that poverty eradication can only be achieved through strong, inclusive and sustainable industrial development, underpinned by the effective integration of the three dimensions of sustainable development: economic, social and environmental. The ISID concept assumes that:

- Every country achieves a higher level of industrialization in their economies and benefits from the globalization of markets for industrial goods and services.
- No one is left behind in benefiting from industrial growth, and prosperity is shared among women and men in all countries.
- Broader economic and social growth is supported within an environmentally sustainable framework. It also implies supporting industrial development while protecting the environment and making efficient use of resources.
- The unique knowledge and resources of all relevant development actors are combined to maximize the development impact of ISID.

¹⁶ https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB2019-report_web-version.pdf

UNIDO's goal of achieving ISID is explicitly recognized and anchored within the internationally agreed 2030 Agenda. Through SDG 9, the Member States of the United Nations call upon the international community to "build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation". ISID, therefore, serves as a primary engine not only of job creation and economic growth but also of technology transfer, investment flows and skills development. In addition to Goal 9, all other SDGs incorporate some industry-related aspects and targets.

To realize UNIDO's ISID mandate and achieve the 2030 Agenda and its SDGs, uptake of new 4IR technologies is key. Innovation, division of labour and job creation dynamics will be different under the new paradigm created by 4IR, bringing up inevitable questions on the readiness of countries to respond to the new industrial revolution. The organization's mission is to foster ISID through the development, transfer and adoption of advanced technology at the global, regional, national and sectoral levels.

To achieve its vision and mission, UNIDO works with the United Nations system and other international organizations, governments, businesses, academia, development finance institutions and the civil society to leverage new 4IR technologies for industrial development that is more knowledge and innovation-driven, with a focus on four core thematic areas: and four cross-cutting areas for building capacity to absorb 4IR technologies such as: promoting knowledge creation and commercialization and skill-building; ensuring the inclusion of disadvantaged and vulnerable sections of the population such as youth, people with disabilities, ethnic minorities and women; and promoting small and medium-sized enterprises (SMEs)' contributions to the real economy; building institutions (norms, standards and conventions); and leveraging multi-stakeholder partnerships.

The four core thematic areas and four cross-cutting areas directly address the three pillars of sustainability (economic, environmental and social) and UNIDO's strategic thematic priorities: creating shared prosperity, advancing economic competitiveness, safeguarding the environment and strengthening knowledge and institutions.

The development results are achieved through a mix of UNIDO's core complementary functions: technical cooperation; analytical and research functions and policy advisory services; normative function and standards-related activities; and convening function and partnerships for large-scale investment, knowledge and technology transfer, networking and industrial cooperation (see also Section C2):

- Carrying out research to support evidence-based policy advice for ensuring the smooth structural transformation to the 4IR.
- Convening and building multi-stakeholder knowledge platforms to address key issues related to the 4IR, such as setting up new norms and standards for interoperability, ensuring security and privacy, addressing the loss of jobs and demand for new skills, and building multi-stakeholder partnerships for supporting the uptake of 4IR technologies.
- Developing technical cooperation projects on the deployment of 4IR technologies for industrial modernization and upgrading, including advocating smart energy; addressing climate change mitigation; promoting the circular economy; ensuring industrial safety and security; addressing 4IR skills and gender gaps; and building the national, regional and sectoral innovation systems for the creation of new knowledge and its commercialization and for smart specialization.
- Strengthening strategic partnerships with a variety of development stakeholders, including governments, financial institutions, the business sector, United Nations entities, academia and the civil society to leverage financial and technical resources to maximize UNIDO's development impact on the ground.

UNIDO, in collaboration with its partners, established knowledge sharing platforms on the opportunities and challenges brought about by the exponential technological change driving the 4IR forward. UNIDO is organizing conferences and Expert Group Meetings, including follow-up reports

and recommendations; guiding tools on 4IR uptake; and tailored made training packages to policymakers and representatives of the private sector and academia.

UNIDO has organized different global and regional fora events on 4IR technologies sharing the associated opportunities and challenges, as well as its impact on specific regions, including:

- An event during UNIDO's 50th Anniversary in 2016: Opportunities and challenges of the New Industrial Revolution for developing countries and economies in transition;
- An event during the World Summit on the Information Society (WSIS) forum in 2017: *Preparing for the 4th Industrial Revolution*.
- Events during the 2nd and 3rd BRIDGE for Cities events in 2017 and 2018: *The belt and road initiative – Industry 4.0 in sustainable and smart cities*; Urban Issue Hub (II) – *Smart City: Smart Productivity and Trade* – focusing on Industry 4.0 implementation in Shanghai.
- An event during the 17th Session of the UNIDO General Conference in 2017: *Industry 4.0 - the opportunities behind the challenge*.
- An event organized in collaboration with the Brookings Institute with a regional focus on Africa in 2018: *Industry 4.0 and Africa*.
- An event during the Science, Technology and Innovation (STI) Forum at the UN Headquarters in New York in 2018: *Industry 4.0 and Digital Strategies- Challenges and Opportunities to achieving SDGs*.
- *The First Regional Conference on Industrial Development – Unlocking the potential of Industry 4.0 for Developing Countries* held in Bali, Indonesia in November 2018. Organized by UNIDO, the Ministry of Industry and the Ministry of Foreign Affairs of Indonesia, the conference encouraged knowledge sharing to raise awareness about the challenges and opportunities of Industry 4.0, and discussed the role of multilateralism and regional cooperation in preparing countries in Asia and the Pacific for a smooth transition to Industry 4.0.
- The *Global Forum on Naturally Based and Convergent Technologies* held in Sochi, Russia in September 2018 and was organized by UNIDO in cooperation with the Russian National Research Centre Kurchatov and the Russian Ministry of Industry and Trade. Around 500 participants discussed topical issues concerning the development of nature-inspired technologies and convergent technologies (nanotechnology, biotechnology, information technology, and cognitive and social sciences-NBICS) driving the 4IR, and the risks and challenges associated with exponential development of these technologies including the marginalization of some countries from these processes. The event stressed the importance of having coherent science, technology and innovation strategies and industrial strategies and monitoring of these processes so that no one is left behind.
- UNIDO organized the conference “*From Lean Management to Industry 4.0*”, which took place in Minsk, Belarus, from 17 to 18 October 2018. The conference addressed issues such as the disruptive potential of the fourth industrial revolution and the convergence of technologies, as well as the importance of being prepared to deal with the challenges related to these processes.
- Conference on “*Leveraging Industry 4.0 technologies for industrial innovation and upgrading in Belarus*” was conducted on the 16 May 2019 in Minsk and addressed such issues as the importance of innovation and ecosystem building, platform approaches, and methodologies for assessing the maturity of small and medium-sized enterprises to adopt Industry 4.0 technologies.
- The *Industry 4.0 and Creative Economy: Promoting Inclusive Ecosystem in the Digital Era* seminar held in Vienna International Centre on 8 July 2019 organized by UNIDO in cooperation with the Government of Indonesia. The seminar provided a proactive platform to find creative approaches to manage the transition to Industry 4.0.

- *BRIDGE for Cities 4.0: Connecting cities through the new industrial revolution* was held in Vienna from 3 to 4 September 2019. It provided a wide and multidisciplinary perspective on how cities can tap into advanced technologies and new industrial solutions to enhance the quality of life for their citizens by reducing cities' carbon footprint, improving public services, as well as creating new jobs, and attracting skilled labour.
- The UNIDO GC18 Side Event on *Fostering innovation and connectivity for a smooth transformation to Industry 4.0* addressed the role of Industrial Artificial Intelligence and convergent technologies for ISID and the implication of 4IR technologies for the future of industrial skills, industrial safety and security and regulatory aspects related to ensuring safety and security.

These events debated how UNIDO could help developing countries address opportunities and challenges stemming from the 4IR in the context of the 2030 Agenda for Sustainable Development and underlined the pivotal role of UNIDO in raising awareness of the potential of 4IR technologies to realize the SDGs.

Governance of 4IR technologies will be a key, and UNIDO continues to shape the discourse for regulatory aspects and for setting norms and standards to ensure access and interoperability of 4IR technologies and systems; and to address safety, security and ethical issues raised by new technologies, as well as jobs' replacement, and the future of work under the 4IR. This also involves convening for setting up new digital norms and standards for interoperability in the digital ecosystem; ensuring security and privacy; addressing qualitative and quantitative changes in skills and jobs; and building multi-stakeholder partnerships for supporting digital economy projects. Innovation, knowledge sharing and exchange, and the development of strategic partnerships are vital to realizing the potential of 4IR technologies for achieving the SDGs.

UNIDO's technical cooperation programmes addressing transformation to 4IR focus on four thematic areas relevant for industrial development: smart agrofood/agribusiness, smart manufacturing, smart energy, and the smart circular economy. UNIDO also addresses four cross-cutting areas for building capacity to absorb 4IR technologies: promoting knowledge creation and commercialization and skill building; ensuring the inclusion of disadvantaged and vulnerable sections of the population such as youth, people with disabilities, ethnic minorities, and women, and promoting small and medium-size enterprises' contributions to the real economy; building institutions (norms, standards and conventions); and leveraging multi-stakeholder partnerships.

UNIDO technical cooperation projects focus on training and reskilling; reforming regulatory frameworks; addressing standards for interoperability in 4IR; ensuring industrial safety and security; providing guiding tools for 4IR technology uptake by SMEs; using e-commerce; innovation ecosystem building for promoting 4IR technological learning and innovation; and fostering partnerships across the UN-system, South-South cooperation, as well as with leading private sector companies, which are major providers of some 4IR technologies.

UNIDO works in partnerships with the national governments, the private sector, academia and financial institutions and non-governmental organizations to set up SME innovation ecosystem platforms, establish pilot learning factories and demonstration and innovation centres, design training curricula to develop new workforce skills, and explore methods and best practices to support SME digital transformation and bridge the digital gender gap. An example of such a tailored project is the Intelligent Manufacturing Technology (IMT) project in China, for which UNIDO has collaborated with the China International Centre for Economic and Technical Exchanges (CICETE) with an aim to improve the penetration rate of ICT in SMEs in Shanghai.

UNIDO has devised a comprehensive strategic framework for policymakers to leverage the benefits of advanced 4IR technologies in establishing smart special economic zones and parks, as a spatial policy instrument for advancing regional economic development and economic integration. The UNIDO technical cooperation project in Belarus launched in March 2018 focused on practical shop-floor

interventions in pilot companies as well as on awareness-raising events including on issues related to lean management, Kaizen, Digital Kaizen and integrating lean and green management.

For mapping and measurement of innovation in general and systems of innovation and firm-level innovation in particular, UNIDO has developed a set of tools and a remote online survey methodology including personal interviews, which have been operationalized and used in technical cooperation projects. Likewise, UNIDO has considerable global experience in undertaking national and firm-level systems of innovation surveys in various industrial sectors, as well as on foreign direct investment. UNIDO is usually involved from the design of the questionnaire and creation of the sample stages to the final stages of report writing, dissemination and presentation of results. This is also supported by numerous peer-reviewed research publications.

While implementing the projects and programmes, UNIDO makes available its tools, methodologies, manuals, guidelines and training kits, allowing the counterparts to apply the best international practices in different areas of technology promotion and transfer. UNIDO established International Technology centres (ITCs), and Investment and Technology Promotion Offices (ITPOs) act as new global mechanisms for building partnerships with other institutions and enterprises in both the public and private sectors. At the same time, well-forged links with the UN and non-UN institutions ensure that time and resources are not wasted by duplicating services.

C. THE PROJECT

C.1. OBJECTIVE OF THE PROJECT

The objective of the project is promoting innovation ecosystem building, with a focus on StartUp and ScaleUp, skills upgrading and leveraging the opportunities and addressing challenges of the 4IR for enhancing SME competitiveness and market access. The project will contribute to ISID and realization of SDG 9 and other SDGs.

C.2. THE UNIDO APPROACH

To build Azerbaijan's requisite capacity to enhance competitiveness in the 4IR era, the project creates and operationalizes the Digital Education and Innovation Centre (DEIC) in cooperation with its counterpart institution, the Innovation Agency. In cooperation with the Innovation Agency, the Project will develop terms of reference (ToR) for the DEIC and will identify a partner institution that will host it. The TOR for the DEIC will take into account gender-related consideration and how the DCEI can become gender-responsive in its provision of services and its governance setup. The project staff will take the basic gender sensitization training by UN Women.

The purpose of the DEIC is to build awareness on the 4IR challenges and opportunities for innovation and competitiveness, and to provide guidance and capacity building activities on StartUp and ScaleUp ecosystem building using a digital learning platform. Drawing on the pool of national and international experts, the DEIC will establish a digital platform for e-learning, webinars and live streaming, and accompanying advocacy material.

E-learning toolkits for the following topics will be developed:

- Business coaching modules on innovation, excellence management and transformation to 4IR.
- Skills requirements for 4IR and how to address them.
- Gender and 4IR, including also the UN Women e-learning course.
- Industrial safety and security issues and how to address them, including best practices.
- Moving from lean management, to Kaizen and to Digital Kaizen, and integrating lean and green management.

- Marketing and branding strategies for the Centre. Communication materials will be designed in a gender-neutral manner.
- Market access under 4IR (case of the EU market).

The DEIC will also organize an expert group meeting, training workshop and a study exposure visit (for instance, to Slovenia) on building the innovation ecosystem (StartUp and ScaleUp ecosystem) and to share experience on international best practices and lessons learned in innovation ecosystem building. At the end of the project, a conference will be organized in Baku on innovation ecosystem building. The conference will present the project results and provide recommendations on how to support business environment reforms to meet the requirements of 4IR for innovation and entrepreneurship. The conference will invite stakeholders from other countries in Eastern Europe and Central Asia. The composition of conference panels will be guided by the International Gender Champions Panel Parity Pledge.¹⁷

It is expected that target beneficiaries increase their awareness on all aspects pertaining to the StartUp and ScaleUp ecosystem building in the 4IR era. It is also expected that business environment conditions fostering technological learning, innovation and entrepreneurship development in the 4IR era will be significantly improved in the country.

UNIDO uses the theory of change (Annex I) approach in delivery of its services, underpinned by an actor-based, behavioural change-based results chain logic, which identifies the key institutions and actors targeted by UNIDO’s interventions, as well as their reactions, knowledge, capacities and changes in practices and behaviours influenced by the Organization.

C.3. RBM CODE AND THEMATIC AREA CODE¹⁸

HC2 (Advancing Economic Competitiveness)

HC21 (Investment, Technology, and SME development)

C.4. EXPECTED OUTCOME

Azerbaijan’s innovation ecosystem strengthened through established DEIC and stakeholders capacitated to absorb (adapt, adopt and disseminate) 4IR technologies.

C.5. OUTPUTS AND ACTIVITIES

Output 1: Digital Education and Innovation Centre (DEIC) established	
Activities	Responsibility
1.1. Organize an inception Expert Group Meeting (EGM) in Azerbaijan for project stakeholders with balanced participation by gender; set up the steering committee and identify possible partner institution that will host the DEIC.	PTC/TII/BCI
1.2. Develop Terms of Reference for the identified partner institution that hosts the DEIC.	PTC/TII/BCI
1.3. Establish of a digital platform for e-learning/webinars/live streaming to enhance a StartUp and ScaleUp ecosystem and accompanying advocacy material.	PTC/TII/BCI
1.4. Develop e-learning toolkits for the digital platform.	PTC/TII/BCI

¹⁷ <https://genderchampions.com/panel-parity>

¹⁸ The theme codes are: EAE, PRP and TCB

1.5. Conduct training workshops for stakeholders on building the StartUp and ScaleUp ecosystem.	PTC/TII/BCI
1.6. Organize study exposure visit (e.g. to Slovenia) to showcase international best practices in innovation ecosystem building.	PTC/TII/BCI
1.7. Organize international (regional) conference on innovation ecosystem building.	PTC/TII/BCI
1.8. Produce project report including recommendations for the follow up activities contributing to fostering innovation capability in Azerbaijan	PTC/TII/BCI

C.5. TIMELINE OF THE ACTIVITIES

Activity	Months														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.1.	■	■	■	■	■										
1.2.					■	■	■	■	■						
1.3.							■	■	■	■	■				
1.4.									■	■	■	■	■		
1.5.						■	■	■	■	■	■	■	■	■	■
1.6.											■	■	■	■	
1.7.														■	■
1.8.														■	■

C.6. RISKS

Risk	Level	Mitigation
Lack of institutional/industry buy-in.	Low	The presence of several key institutions and industry at the inception EGM and commitment of these institutions to project implementation.
Delays in implementation due to the multi-stakeholder approach.	Low-Medium Risk	Minimized through adoption of a participatory approach at all stages, sound communication with participating stakeholders, and setting and monitoring of key milestones and targets.
Different stakeholders may perceive varying degrees of benefits from the capacity-building program depending on their absorptive capacity and ownership of the project objectives.	Low	To the extent possible, the project will attempt to assess recipients' needs and adjust the sophistication level of the training to match that capacity, through the questionnaire designed to fit the purpose.

The provision of facilities for the DEIC is not provided sufficiently, or on time.	Medium	Alternative hosting organizations and facilities could be contacted to avoid disruptions to the implementation plan.
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C.7. GENDER MAINSTREAMING POLICY

The project aims at encouraging women and youth to participate in the project workshop, EGM, conference, trainings and study tour, and to ensure that women and men, as well as persons with disabilities, equally benefit from capacity building and other activities wherever possible. The project will ensure gender balance on panels during the conferences organized as part of the project. The project will also benefit from the equal participation of women and men in both project management and as beneficiaries, partners and key stakeholders of the project, and in this regard will liaison with women associations in the country.

In compliance with the UNIDO gender mainstreaming guidelines, the project will further provide the basic “I Know Gender” online course in the UN Women e-Learning Campus (<https://trainingcentre.unwomen.org>) for learning and promoting relevant issues. The project management team will also strive to encourage gender parity in planning the project activities and will ensure that recommendations and policy reviews prepared during the project implementation will be gender-responsive, and liaison with women associations will be established.

Further, all advocacy materials and other communication activities will use gender-neutral language and gender-balanced representation as well as not use images/descriptions which would reinforce gender stereotypes.

C.8. ENVIRONMENTAL AND SOCIAL ASSESSMENT

The objective of this project is to promote innovation ecosystem building as well as to raise awareness on the opportunities and challenges of the fourth industrial revolution (4IR). As per UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), the Environmental and Social screening template has been completed and this project has been categorized as ‘‘C’’. Although no further specific environmental and/or social assessment is required for category C projects, environmental and social aspects will be duly considered in all the trainings and the capacity building activities.

D. INPUTS

D.1. COUNTERPART INPUTS

- The Government of Azerbaijan contributes to organizing the EGM and international conference: hospitality, conference premises, translation (TBC) and technical equipment.
- The Government of Azerbaijan provides facilities for the DEIC in the inception phase.

D.2. UNIDO INPUTS

The project management will be led by the UNIDO Business Environment, Cluster and Innovation Division, under the Department of Trade, Investment and Innovation, and in close consultation with counterpart institutions.

E. BUDGET

The proposed budget is EUR **199,725.50** including support costs and coordination costs, covering 15 months.

BL	Description	2020	2021	Total
	Outcomes:			
	Azerbaijan's innovation and digital ecosystem approach strengthened.			
	The stakeholders from government, intermediary organizations and industry (SMEs) capacitated to better understand the opportunities and challenges of 4IR for innovation, entrepreneurship and competitiveness.			
	Output 1: DEIC established			
11	International experts	25,000	10,000	35,000
15	Project travel	6,000	4,000	10,000
16	Staff travel	4,000	4,000	8,000
17	National experts & admin staff	12,000	15,000	27,000
21	Subcontracts	25,000	14,000	39,000
30	In-country training, workshop, and study tours	15,000	15,000	30,000
35	Expert group meeting (EGM)	8,000	10,000	18,000
51	Miscellaneous	6,000	2,000	8,000
Sub-Total Output 1		101,000	74,000	175,000
TOTAL Net Budget		101,000	74,000	175,000
Programme Support Cost (13%)				22,750
Total programme budget				197,750
The 1 % coordination levy				1,977.5
Total				199,725.50

F. MONITORING, REPORTING AND EVALUATION

Reporting, monitoring and evaluation will be conducted in accordance with the provisions of the UNIDO technical cooperation guidelines and applicable UNIDO policies. Monitoring, reporting and evaluation will be carried out in a participatory and systematic way. Quantitative and qualitative performance indicators will be applied to guide monitoring, reporting and evaluation of the project. The final report should reflect all aspects of the implementation of the project over the reporting period. The descriptive sections of the final report will contain an assessment of the outcomes of the project.

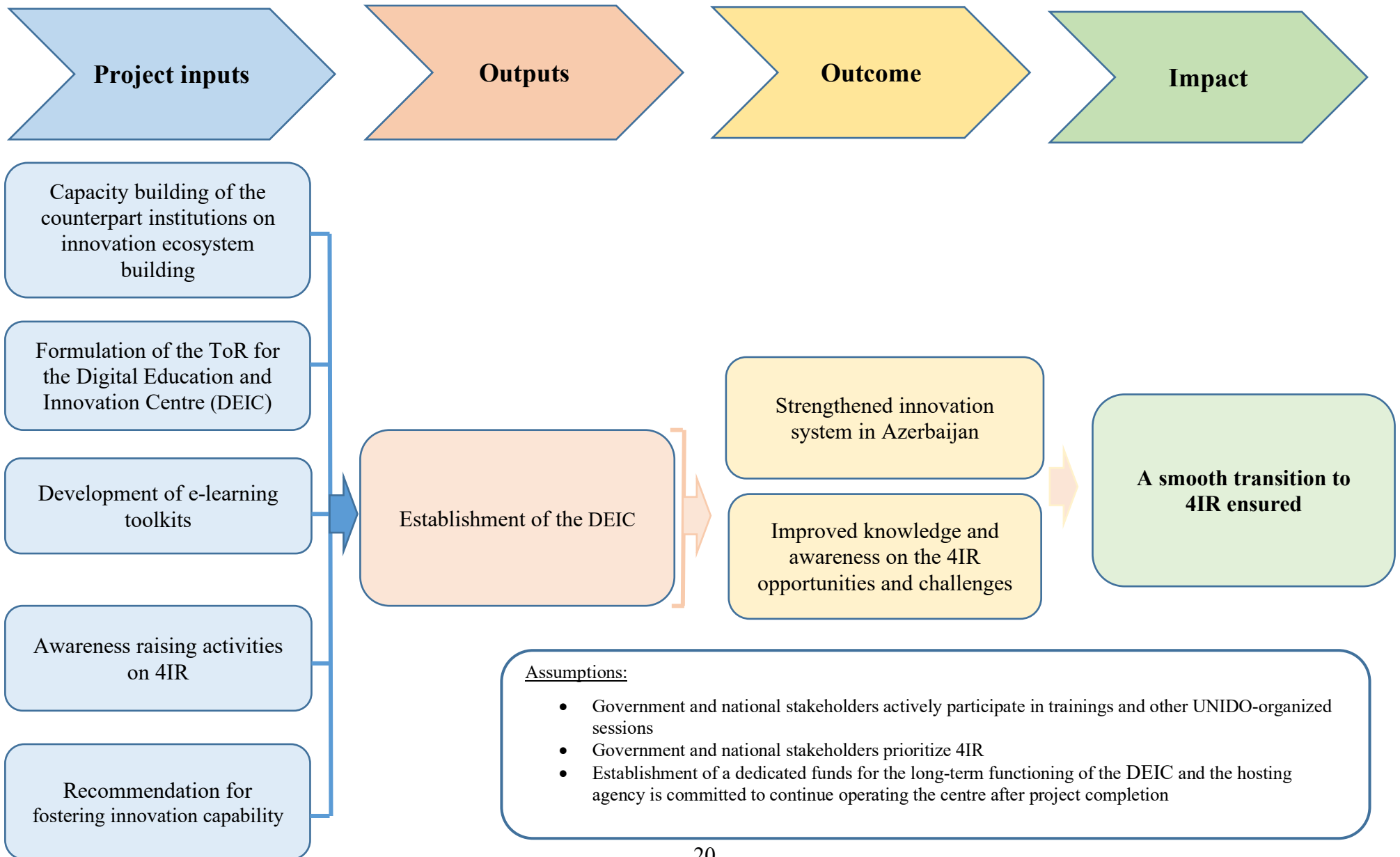
G. PRIOR OBLIGATIONS AND PREREQUISITES

N.A.

H. LEGAL CONTEXT

The Government of the Republic of Azerbaijan agrees to apply to the present project, *mutatis mutandis*, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed on 6 January 2001.

Annex I: The Theory of Change for the project



Annex II: Logical framework

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
Development goal/impact	A smooth transition to 4IR ensured. Contributed to SDGs 1, 5, 8, 9, 17.	SDG 9.2.1: Manufacturing value added as a proportion of GDP and per capita SDG 9.b.1: Proportion of medium and high-tech industry value added in total value added ECO.1: Number of firms with economic gains (additional sales, savings) ECO.3: Number of firms with an increase in exports WEF indicators for readiness indices INSEAD innovation index	<ul style="list-style-type: none"> • UNIDO statistics • National statistics • World Bank Statistics • World Economic Forum reports • INSEAD reports 	<ul style="list-style-type: none"> • Stable macroeconomic and political situation.
Outcome(s)/immediate objective(s)/	Azerbaijan's innovation ecosystem strengthened. Stakeholders capacitated to understand the potential of the transformation to 4IR and uptake of 4IR technologies and business models.	BUS.1: Cumulative/Annual number of start-up firms BUS.2: Cumulative/Annual number of firms with uptake of affordable 4IR technologies TEC.3: Number of new technologies adopted REA.2: Number of stakeholders reached (private, public, academia, sex-disaggregated) and participate in established innovation and business ecosystem	<ul style="list-style-type: none"> • Development plans • Meeting protocols/minutes/proceedings with registered participants with particular attention on gender • Business environment reforms conducted • Industry investment plans • Corporate strategies • Strategies for Gender Mainstreaming and inclusion DEIC activities 	<ul style="list-style-type: none"> • Government and meso level institutions committed to the project and participate in trainings and other project activities • Government and meso level institutions prioritise transformation to 4IR • Representatives of industry (industry associations) regularly participate in project activities

				<ul style="list-style-type: none"> • Industry has an interest in modernization and upgrading to 4IR
Output (result)	Digital Education and Innovation Centre (DEIC) established	<p>TCO.1: Number of capacity building activities provided</p> <p>TCO.2: Value of assets provided</p> <p>TCO.3: Number of toolkits and guidelines produced</p> <p>CPO.1: Number of global fora, workshops/EGM/ awareness study tours organized</p> <p>DEIC established and functioning</p> <p>Attendance of Stakeholders at various activities organized by the DEIC</p> <p>International conference (regional) organized</p>	<ul style="list-style-type: none"> • TOR and legal documents for DEIC • Work plan of the DEIC • EGM/workshops meeting minutes • Training modules, including on gender and 4IR and the UN Women e-learning course • List of participants undergoing training showing fair gender representation (at least 40%) • EGM and workshops reports • Study tour programme and training package included. Registration documents for study tour participants • Multimedia outreach tools • Conference report 	<p>Dedicated institution and funds for the long-term functioning of the DEIC secured</p> <ul style="list-style-type: none"> • Dedicated staff of the DEIC • Hosting agency/institution is committed to continue operating the DEIC e after the project ends • Local industry sufficiently interested in being associated with the project • Demand for training tools increases • Gender parity respected by all parties in all functions of the DEIC

AZƏRBAYCAN RESPUBLİKASININ
NƏQLİYYAT, RABİTƏ VƏ YÜKSƏK
TEKNOLOGİYALAR NAZİRLİYİ

AZ1000, Bakı şəhəri,
Zərifə Əliyeva küçəsi, 77
Tel.: +(994 12) 498-58-38
Faks: +(994 12) 498-79-12
Elektron poçtu: mincom@mincom.gov.az
<http://www.mincom.gov.az>



THE MINISTRY OF TRANSPORT,
COMMUNICATIONS AND HIGH TECHNOLOGIES
OF THE REPUBLIC OF AZERBAIJAN

77, Zərifə Aliyeva Str., AZ 1000
Baku, Azerbaijan,
Phone: +(994-12) 498-58-38
Fax: +(994-12) 498-79-12
E-mail: mincom@mincom.gov.az
<http://www.mincom.gov.az>

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Mr. Philippe Scholtes

**Managing Director
Directorate of Programme
Development and Technical Cooperation
UNIDO**

Address: Vienna International Centre Wagramer str. 5
P.O. Box 300 A-1400 Vienna, Austria
Tel: +43 (1) 26026-0
Fax: +43 (1) 2692669

Dear Mr. Scholtes,

The Ministry of Transport, Communications and High Technologies of The Republic of Azerbaijan appreciates UNIDO's intention to implement development projects for innovation ecosystem and infrastructure in its Member States including the Republic of Azerbaijan.

Hereby, we would like to express our readiness to support UNIDO activities for getting acquired and sharing knowledge and experience, as well as best practices to promote innovation ecosystem building and facilitate the competitiveness of innovative enterprises in Azerbaijan.

Sincerely,

**Elmir Velizadeh
Deputy Minister**