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# ICT Labor Market Research in Albania

2025





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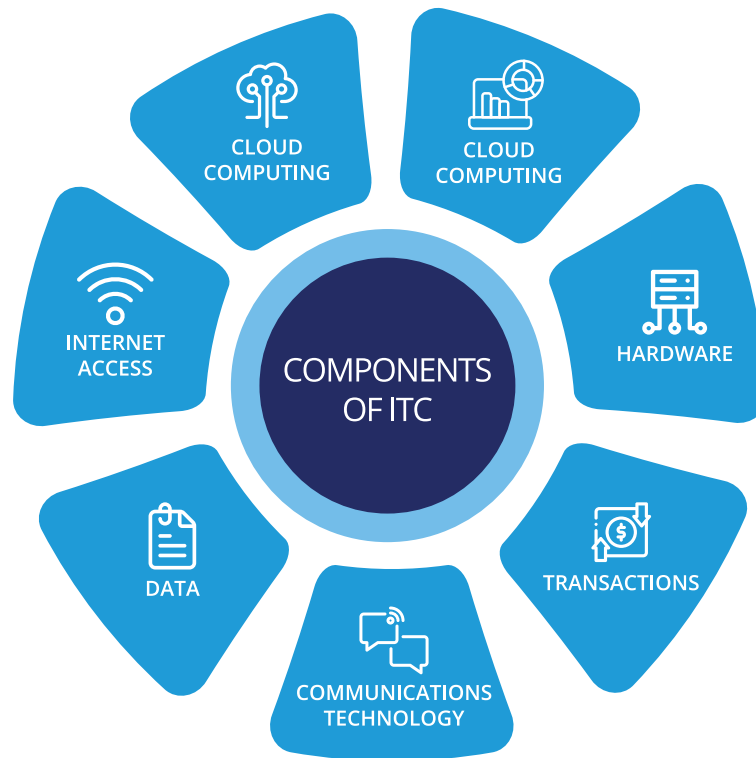
# Abbreviations

<b>ACTP</b>	Accreditation Commission for Training Program Modules
<b>AFQ</b>	Albanian Qualification Framework
<b>AI</b>	Artificial Intelligence
<b>AKAP</b>	National Agency for Pre-University Education
<b>B&amp;I</b>	Businesses and Institutions
<b>EU</b>	European Union
<b>FTE</b>	Full-Time Employees
<b>G4</b>	Fourth-Generation regulatory regime
<b>HEI</b>	High Education Institutions
<b>HR</b>	Human Resource
<b>ICT</b>	Information and Communication Technology
<b>ILO</b>	International Labor Office
<b>INSTAT</b>	Institute of Statistics
<b>IPA</b>	Instrument for Pre Accession
<b>IT</b>	Information Technology
<b>LMS</b>	Learning Management Systems
<b>MoES</b>	Ministry of Education and Sports
<b>NACE</b>	European Statistical Classification of Economic Activities
<b>NAES</b>	National Agency for Employment and Skills
<b>NAVETQ</b>	National Agency for VET and Qualifications
<b>OECD</b>	The Organization for Economic Cooperation and Development
<b>PKZHM</b>	National Teacher Development Program
<b>QAAHE</b>	Quality Assurance Agency for High Education
<b>QAAPE</b>	Quality Assurance Agency for Pre-university Education
<b>SMIP</b>	Management System of Pre University Information
<b>SNA</b>	Skills Needs Analysis
<b>SSC</b>	Sectorial Skills Committee
<b>STEM</b>	Science, Technology, Engineering, and Mathematics
<b>VET</b>	Vocational Education and Training
<b>WBIF</b>	Western Balkans Investment Framework

# 1. INTRODUCTION

Over the years, various definitions of ICT have emerged. While ICT is often used interchangeably with information technology (IT), the two terms have distinct meanings. IT primarily concerns computer hardware, software, and networking technologies, whereas ICT encompasses a broader range of communication technologies, including the telegraph, telephone, radio, and television, along with the services they support. The main components of ICT are illustrated in the following chart, though this list continues to expand each year.

Figure 1: ICT Components



Source: Tech Target (2024)

This study provides insights in the Information and Communication Technology (ICT) labor market including demand, supply, equilibrium and projections for the future ICT labor market. It is based on the OECD 2007 definition<sup>1</sup>, which states: “The ICT industries are those whose products (goods and services) are intended to fulfill or enable the processing and communication of information by electronic means, including its transmission and visual presentation.” In line with this definition, the study also considers the significance of ICT goods and services beyond the ICT sector itself, including their relevance in private businesses and government institutions.

1 [https://www.ine.es/en/daco/daco42/inditic/metoinditic\\_en.pdf](https://www.ine.es/en/daco/daco42/inditic/metoinditic_en.pdf)

# EU and Albanian ICT strategic development

Since 2010, the **European Union** (EU) has established a digital agenda spanning two main periods: 2010–2020 and 2020–2030, with the aim of empowering people and supporting business prosperity. The 2010–2020 digital agenda achieved several milestones: it reduced electronic communication prices, enhanced internet connectivity, and strengthened consumer protection in telecommunications; it opened also the gates to digital skills development, industry digitalization, Artificial Intelligence (AI) advancement, and modernization of public services. Regulatory frameworks were introduced to protect consumers, safeguard data, and facilitate a data-driven economy.

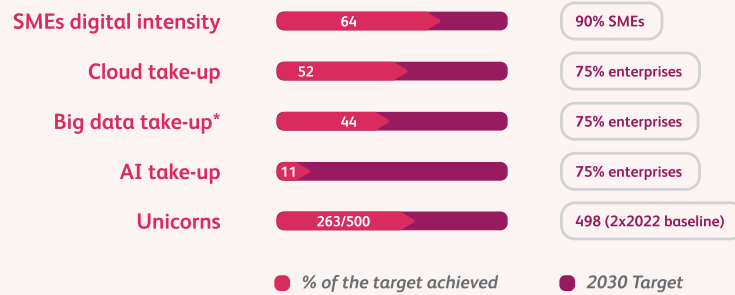
The ongoing 2020–2030 digital agenda focuses on skills development of the population and digital professionals training; secure and sustainable digital infrastructures; digital transformation of businesses; and advancing the digitalization of public services.

In 2021, the EU introduced the Digital Compass, setting out the 2030 targets across four priority areas, with annual monitoring through the Digital Decade Framework. The Digital Decade Report 2024 emphasized the need for increased efforts in digital skills development, high-quality connectivity, AI, and business adoption of data analytics. It recommended prioritizing investment in digital education and skills, supporting early exposure of young people — especially girls — to Science, Technology, Engineering, and Mathematics (STEM), and promoting lifelong learning in the field of ICT to further progress in digital competencies.

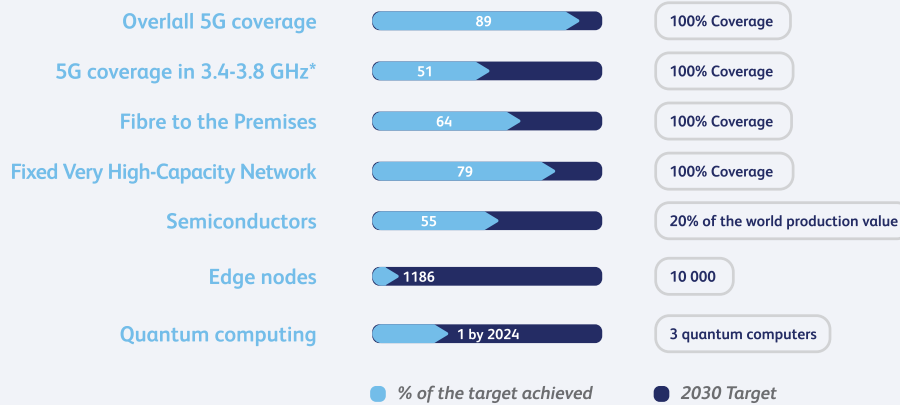
Figure 2: Digital Compass 2030 targets according to priority areas



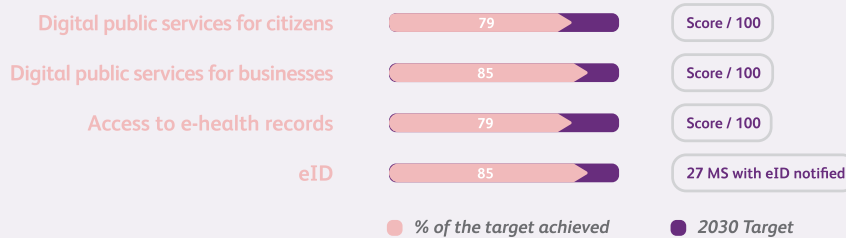
### Digital Transformation of Business



### Digital Infrastructure



### Digital Public Services



The digital transformation of Europe is supported by four major financing programs and funds namely the Recovery and Resilience Fund (€150 billion), the Digital Europe Program (€8.1 billion), the Connecting Europe Facility (€1.7 billion), and the Cohesion Funds (€31 billion).

Despite this notable focus and progress, the EU faces challenges in keeping pace with the innovation levels of the United States and China and remain globally competitive by focusing on advanced technologies such as

artificial intelligence (AI), addressing structural rigidities, and significantly enhancing investment in emerging technology sectors. To this end, Europe plans a €200 billion investment in AI to better compete with the United States and China; and ICT spending growth, reaching a value of €1 trillion in 2024, with projections to surpass €1.2 trillion by 2027 and €1.9 billion in state aid to support Intel's chip assembly, as part of efforts to increase Europe's share of the global semiconductor market.

**Albania** is currently implementing the Digital Agenda 2022-2026<sup>2</sup>, a strategic framework centered on Digital Governance; Digital Businesses; Digital Citizens; and Digital Education and Skills. The strategy promotes investments in critical areas such as advanced computing, data processing, AI, cybersecurity, and advanced digital skills. In addition to the Digital Agenda, several other important strategic documents are under implementation such as “*National Plan for Sustainable Development of Digital Infrastructure, Broadband 2020-2025*”<sup>3</sup>; The “*Strategic Plan on the Fifth Generation (5G) Technology for Albania*”<sup>4</sup>; the “*National Strategy for Scientific Research, Technology and Innovation 2023-2030*”<sup>5</sup>; “*National CyberSecurity Strategy 2020-2025*”<sup>6</sup>; the “*National Education Strategy 2021-2026*”; the “*National Strategy for Employment and Skills 2024-2030*”<sup>7</sup>; the “*Business and Investment Development Strategy 2021-2027*”<sup>8</sup> and “*Smart Specialization Strategy 2030*”<sup>9</sup>.

The digital transformation of Albania is supported by various funding programs. The most important are: (i) the Instrument for Pre Accession (IPA) Annual Action Program 2024 and IPA Multiannual Operational Programs 2024-2027, which focus on digital economy, society, energy, and youth employment, amounting to €197.35 million; (ii) the Reform and Growth Facility (RGF), which covers key reforms in five policy areas: business environment and private sector development; green energy; digitalization; human capital development; and rule of law (with a total allocation of €922.1 million, contingent upon compliance with preconditions and the successful delivery of reforms outlined in the Reform Agenda - RA); and (iii) the Western Balkans Investment Framework (WBIF), which provides IPA III grants for flagship projects in clean energy, the environment, climate, digital advancement, and sustainable transport, totaling €333.4 million. Additional IPA support instruments have also been deployed to strengthen the resilience of Western Balkans partners in facing hybrid threats, including cyber-attacks and foreign information manipulation.

The 2024 EU Progress Report for Albania<sup>10</sup> provides a comprehensive assessment of the country's ICT sector, recognizing significant progress, particularly in the development of digital infrastructure and the sector's contribution to the economy. In the area of digital transformation, notable progress was made with the introduction of legislation on cybersecurity and electronic communications. Significant progress is made in digital infrastructure and governance. Currently, 95% of applications for 1,237 public services are available online. Equal access to these online services for all citizens as well as strengthening cybersecurity capacities and ensuring effective implementation of the new legislation remain key challenges for the future. Advances have been also made in enhancing digital skills through curriculum development and training for teachers and school principals. Further efforts are needed to enhance the capacity to develop digital skills.

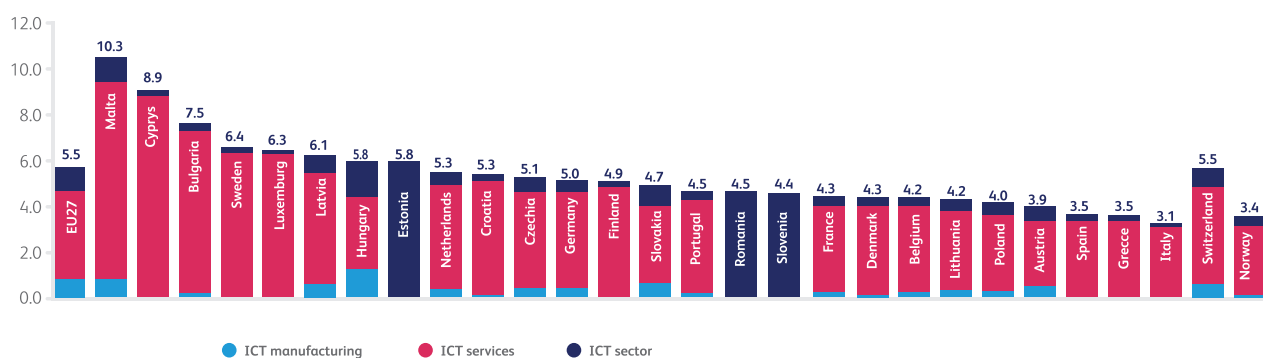
2 <https://akshi.gov.al/wp-content/uploads/2022/06/vendim-2022-06-01-370-Agjenda-Digjitale-e-Shqiperise-22-26-dhe-plani-i-veprimit.pdf>  
3 <https://www.infrastruktura.gov.al/wp-content/uploads/2020/07/National-Plan-BBAnd-EN.pdf>  
4 <https://akep.al/wp-content/uploads/2022/04/5G-strategic-plan-final-march-2022.pdf>  
5 <https://qbz.gov.al/eli/vendim/2023/09/20/542/96f316d6-b135-42fb-a64a-abbfa9484c8>  
6 <https://aksk.gov.al/wp-content/uploads/2024/01/Monitoring-of-the-National-Cyber-Security-Strategy-2022.pdf>  
7 [https://arkiva.financa.gov.al/wp-content/uploads/2023/10/National-Employment-and-Skills-Strategy-2030\\_EN.pdf](https://arkiva.financa.gov.al/wp-content/uploads/2023/10/National-Employment-and-Skills-Strategy-2030_EN.pdf)  
8 <https://qeverisjovendore.gov.al/wp-content/uploads/2024/08/VE0DDD1.pdf>  
9 <https://westernbalkans-infohub.eu/documents/draft-of-the-smart-specialization-strategy-s3-in-albania/>  
10 [https://enlargement.ec.europa.eu/albania-report-2024\\_en](https://enlargement.ec.europa.eu/albania-report-2024_en)

# ICT Sector in figures for EU and Albania

The ICT sector is one of the fastest-growing sectors in the EU economy and has become a key driver for growth in other sectors. Between 2013 and 2023, the ICT sector experienced an average annual growth rate of 6.3% across the 27 OECD countries, outperforming the overall economy by nearly threefold. Notably, in 2023, the sector's growth accelerated to 7.6%, with countries such as the United Kingdom, Belgium, Germany, Austria, and the Netherlands reporting growth rates exceeding 10%<sup>11</sup>.

Over the past decade, the growth in value-added was significantly higher for ICT services (71.1%) compared to ICT manufacturing (28.4%). There is considerable variation among EU countries in terms of the ICT sector's value-added contribution and its components. For example, Malta (10.3%) and Cyprus (8.9%) experienced the largest growth rates, while Italy (3.1%), Greece (3.5%), and Spain (3.5%) had the lowest<sup>12</sup>.

**Figure 3:** Value added for the ICT sector, EU 2022 (in %, relative to gross value added)

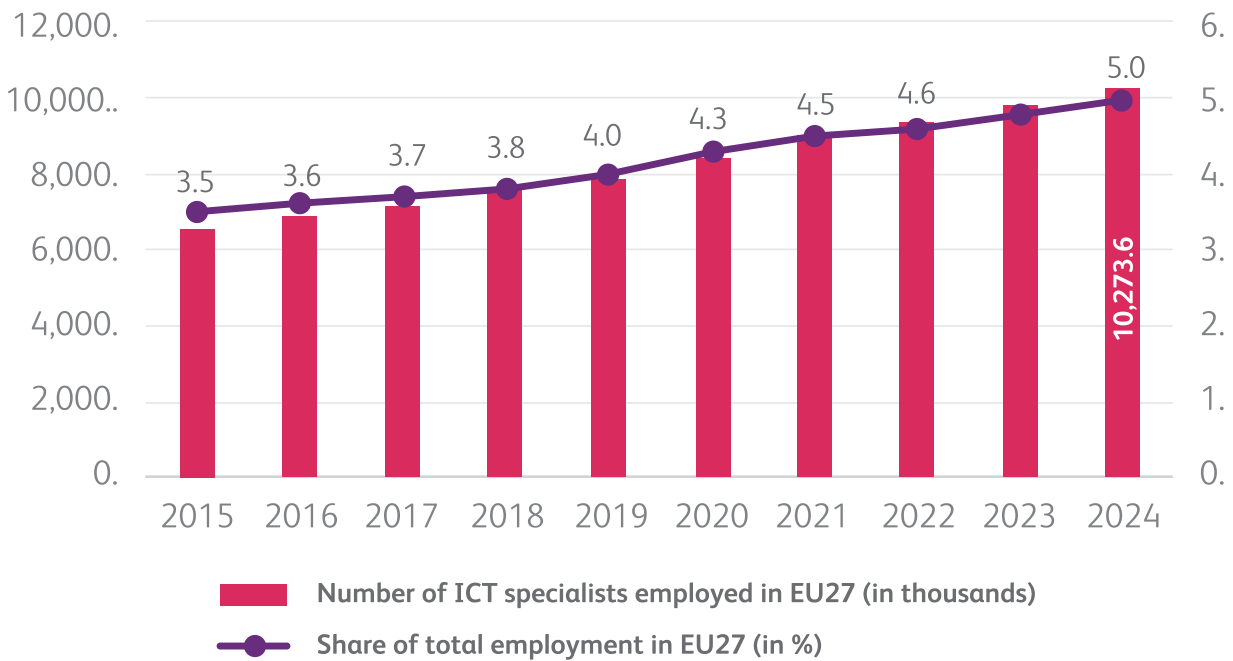


Source: Eurostat (2025)

In 2024, more than 10 million ICT specialists were employed across EU countries, representing 5% of the total workforce. These professionals are key drivers of digital and digital-enabled innovations and are essential to the competitiveness of modern economies. From 2014 to 2024, the number of ICT specialists in the EU increased by 62.2%, significantly outpacing the overall employment growth during the same period - slightly less than six times as high as the corresponding increase (10.6%) for total employment<sup>13</sup>, underscoring the broader digital transformation of the economy.

<sup>11</sup> [https://www.oecd.org/en/about/news/press-releases/2024/05/growth-of-digital-economy-outperforms-overall-growth-across-oecd.html?utm\\_source=chatgpt.com](https://www.oecd.org/en/about/news/press-releases/2024/05/growth-of-digital-economy-outperforms-overall-growth-across-oecd.html?utm_source=chatgpt.com)  
<sup>12</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT\\_sector\\_-\\_value\\_added,\\_employment\\_and\\_R%26D](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_sector_-_value_added,_employment_and_R%26D)  
<sup>13</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT\\_specialists\\_in\\_employment#Relative\\_share\\_of\\_ICT\\_specialists\\_in\\_total\\_employment](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_in_employment#Relative_share_of_ICT_specialists_in_total_employment)

**Figure 4:** Number of ICT specialists and share in total employment in EU27



Source: Eurostat (2025)

In 2024, Germany led the EU with 2.3 million ICT specialists, accounting for more than one-fifth (22.1 %) of the EU’s total ICT employment. France followed with 1.4 million specialists (13.6 %), while Italy and Spain each employed around 1 million ICT professionals, representing 10% and 9.2%, respectively).

In 2024, 80.5% of ICT specialists in the EU are men against 19.5% of women, thus remaining a male-dominated sector. A closer analysis of this gender gap reveals that there were 24 EU countries where the share of female ICT specialists rose during the period 2014 - 2024.

In the EU, more than 9 out of 10 individuals with ICT education are employed, and women accounted for 17.9% of the total number of employed people in the EU with an ICT education<sup>14</sup>. More than 7 out of 10 (73.7%) employed people in the EU with an ICT education had a tertiary level<sup>15</sup> of educational attainment. Data from 2024 shows that over two-thirds (67.4%) of ICT specialists in the EU who reported their educational level had completed tertiary education. Over the past decade (2014-2024), the share of ICT specialists with a tertiary level of education increased by 28.8 percentage points<sup>16</sup>.

60.6% of employed persons in Information and communication (Section J, NACE Rev.2) were ICT specialists – the highest share of all NACE Rev.2 sections. In 2024, less than two-thirds (62.8%) of all ICT specialists employed in the EU were aged 35 years and over, at the same level as it was in 2014 (62.9%).

<sup>14</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT\\_education\\_-\\_a\\_statistical\\_overview](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_education_-_a_statistical_overview)

<sup>15</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:International\\_standard\\_classification\\_of\\_education\\_\(ISCED\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:International_standard_classification_of_education_(ISCED))

<sup>16</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT\\_specialists\\_in\\_employment#Relative\\_share\\_of\\_ICT\\_specialists\\_in\\_total\\_employment](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_in_employment#Relative_share_of_ICT_specialists_in_total_employment)

Larger enterprises are more likely to have in-house ICT specialists, while smaller businesses tend to rely on external providers for ICT services. In 2023, approximately **71.9% of EU enterprises outsourced their ICT functions, either fully or partially**. 83.3% of large enterprises (250 or more employees), 79.7% of medium-sized enterprises (50 to 249 employees), and 70.2% of small enterprises (10 to 49 employees) in which ICT functions are performed by external suppliers. On the other hand, the disparities between the enterprises of different size classes were much higher when comparing the share of enterprises where own employees performed the ICT functions. While in 87.2% of large enterprises the ICT functions were performed by own employees, this was the case only in 34.4% of small enterprises<sup>17</sup>.

Besides companies in information and communication activities, the highest percentages of enterprises employing ICT specialists were found in the sectors of 'professional, scientific and technical activities' (30.9%), 'electricity, gas, steam, air conditioning and water supply' (28.8%), and 'real estate' (21.9%). The 'accommodation and food services' sector had the lowest proportion of enterprises employing ICT specialists in 2024 in the EU (7.7%).

In 2024, 9.6% of EU enterprises reported that, during 2023, they recruited or tried to recruit ICT specialists and 57.5% of these enterprises had difficulties in filling those vacancies. The share of enterprises recruiting or trying to recruit ICT specialists was much higher in information and communication activities (56%) than in the rest of the economy. In 2024, 51.9% of large enterprises sought to recruit ICT specialists, compared to just 6.2% of small enterprises.

The lack of applications was the difficulty for filling ICT specialists' positions most often faced by enterprises in 2023 (43.2%). Lack of relevant qualifications, high salary expectations and lack of experience were almost equally significant barriers faced by enterprises when filling ICT specialists' vacancies and reported by only a slightly lower share of enterprises. Enterprises that recruited or tried to recruit ICT specialists, faced the same difficulties regardless of their enterprise size.

In 2023, 11.4% of EU enterprises provided professional training to their ICT specialists, while 22.3% offered ICT training to other staff members. The ratio reached 72.6% among large enterprises, which was more than four times higher than for small enterprises (17.2%). Among large enterprises, the share of enterprises that provided ICT training to ICT specialists reached 61.4%, while 7.1% of small enterprises provided ICT related training to their ICT specialists<sup>18</sup>. The EU leaders in providing ICT training to employees were Finland (40%), Sweden (34%), Denmark, and Belgium (both 33%)<sup>19</sup>. As dependence on digital technologies grows, it is vital for the workforce to adapt to changing skill requirements in order to maintain competitive leadership. By 2024, in every EU country but with large variances, labor productivity in the ICT sector is higher than in the rest of the business economy<sup>20</sup>.

<sup>17</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT\\_specialists\\_-\\_statistics\\_on\\_hard-to-fill\\_vacancies\\_in\\_enterprises#ICT\\_functions\\_performed\\_in\\_enterprises](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_specialists_-_statistics_on_hard-to-fill_vacancies_in_enterprises#ICT_functions_performed_in_enterprises)

<sup>18</sup> Ibid

<sup>19</sup> <https://ec.europa.eu/eurostat/web/interactive-publications/digitalisation-2024#about-this-publication>.

<sup>20</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT\\_sector\\_-\\_value\\_added,\\_employment\\_and\\_R%26D#Apparent\\_labour\\_productivity](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=ICT_sector_-_value_added,_employment_and_R%26D#Apparent_labour_productivity)

### Policy initiatives to promote women in digital

The 2022 “Digital Compass & Digital Decade Policy Program 2030”<sup>21</sup> set an ambitious target to increase the number of female ICT professionals meaning increasing the number of girls and women studying ICT, both at school and at university, the Declaration on “Women in Digital Commitment”<sup>22</sup> was signed in 2019 by 26 EU countries to increase the number of girls and women in the ICT work sector, the Digital Economy and Society Index (DESI) is now integrated into the State of the Digital Decade report and an integral part of it is ‘Women in Digital Scoreboard’ in order to monitor the gap between men and women in the ICT field. Also, the Council Recommendation on Improving Digital Skills in Education (November 2023)<sup>23</sup> encourages more women in digital careers and address barriers for girls in ICT studies and careers. Funding is also conceived to support women and girls. Thus, **Digital Europe Program**, put emphasis on ways to attract more female students to become ICT specialists, allocate 6 million EUR to boost digital skills of young people, particularly girls covering activities such as the EU Code Week, summer schools and career days specifically targeting girls’ interest in taking up an ICT related study or career, 2 million EUR in 2024 for the project “Girls and Women in Digital” to build an community and support to help more females in ICT. The “**Horizon Europe Program**” embeds gender equality as part of research and innovation funding and funds projects like the Women Tech EU call, which supports up to 130 deep-tech start-ups led by women with a budget of €10 million. Under the third program “**Creative Europe MEDIA Program**” the EU Commission supports campaigns to fight gender stereotypes in the creative industries. Funding also provides mentorship and training for women in film-making.

**In Albania**, ICT is a priority sector for economic growth<sup>24</sup>. Since 2020, Albania has been classified under the Fourth-Generation regulatory regime (G4), driven by economic and social policy objectives. The country’s ICT regulatory framework has made notable progress, achieving a high score of 88 on the ICT Regulatory Tracker of ITU, surpassing both the global average of 72.7 and the European average of 85.8 in 2022<sup>25</sup> and an overall score of 91 from ITU 2024, as a result of the regulatory authority score (19), regulatory mandate score (20), regulatory regime score (26), and the competition framework score (26)<sup>26</sup>. However, the development of digital infrastructure and telecommunications networks remains a challenge, particularly in supporting the full digital transformation of the economy and fostering innovation in key sectors such as energy, transport, industry, and education, as well as improving the quality of public services.

Albania lags behind regional averages in several key ICT indicators, such as fiber internet subscriptions, mobile data affordability (with a device affordability score of 52.06, compared to the regional average of 71.26), and digital skills (rated at 49.90, compared to the regional score of 61.16). While ICT infrastructure is well-developed in urban areas, rural connectivity remains a significant challenge, hindering overall growth despite affordable internet access<sup>27</sup>.

According to the OECD convergence scoreboard<sup>28</sup>, digital infrastructure remains inadequate, as reflected in the economy’s low broadband speeds. Digital Transformation is a relatively weak area for Albania, with overall performance ranking second-to-last in the region. While internet usage is widespread and businesses’ adoption of digital technologies is relatively high, the overall digital proficiency of Albania’s population remains limited, and there is low engagement with digital public services. Additionally, the ICT sector is comparatively underdeveloped.

21 [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en)

22 [https://ec.europa.eu/newsroom/dae/document.cfm?doc\\_id=58562](https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=58562)

23 <https://data.consilium.europa.eu/doc/document/ST-15740-2023-INIT/en/pdf>

24 <https://www.investment.com.al/wp-content/uploads/2023/01/Dokument-Pune-15-%E2%80%93-Mbi-Potencialin-e-Investimeve-dhe-Sektoret-Prioritare.pdf>

25 <https://app.gen5.digital/tracker/charts> accessed in June 2024

26 <https://app.gen5.digital/tracker/country-cards/Albania>

27 [https://albania.un.org/sites/default/files/2022-05/Digital%20Development%20Country%20Profile\\_Albania\\_fina\\_02.22.pdf](https://albania.un.org/sites/default/files/2022-05/Digital%20Development%20Country%20Profile_Albania_fina_02.22.pdf)

28 [https://www.oecd.org/en/publications/economic-convergence-scoreboard-for-the-western-balkans-2025\\_bc0babf3-en/full-report/economy-profiles\\_de4fe470.html#annex-d1e12206-a261219c89](https://www.oecd.org/en/publications/economic-convergence-scoreboard-for-the-western-balkans-2025_bc0babf3-en/full-report/economy-profiles_de4fe470.html#annex-d1e12206-a261219c89)

According to the European Innovation Scoreboard<sup>29</sup>, as an Emerging Innovator with performance at 41.8% of the EU average in 2024, Albania is identified with the following strengths and weaknesses: enterprises providing ICT training (relative strength); employed ICT specialists and exports of medium and high technology products (relative weaknesses); as well as individuals with above basic overall digital skills (string increase since 2023).

According to RCC WB Digital Economy Society Index (DESI)<sup>30</sup>, in total score 2022, Albania is a digital top performer, with DESI score above the WB average. Considering index dimensions, Albania achieved strong performance in Integration of digital technology, Connectivity and Digital public services, with scores above the WB averages. Further improvements are necessary in the Human capital dimension.

In 2024, Albania's share of ICT employees in the workforce was on par with other Western Balkan countries, reflecting regional trends in ICT employment<sup>31</sup>. The ICT sector employs approximately 150,000 people in the Western Balkans, representing 2.9% of the total registered workforce<sup>32</sup>.

The average gross monthly salary for ICT specialists in 2023 was ALL 108, 987 and in 2024 it increased to 117,357<sup>33</sup>. The gender pay gap for ICT specialists significantly decreased, from 13.9% in 2016 to 5.4%<sup>34</sup> by 2024.

## National vs. International dynamics and trends

Significant technological advancements and transformations have led to the emergence of new professions that were previously unimaginable in today's labor market. As technology continues to evolve, new roles are being created to meet the growing demand for specialized skills and expertise, resulting in job opportunities that did not exist before. These roles often involve cutting-edge technologies such as artificial intelligence, blockchain, and cybersecurity, reflecting the dynamic and ever-changing nature of the modern workforce.

The majority of the fastest-growing roles are technology-related. AI and Machine Learning Specialists top the list of fast-growing jobs, followed by Sustainability Specialists, Business Intelligence Analysts, and Information Security Analysts<sup>35</sup>. According to Techopedia (2024)<sup>36</sup>, the most in-demand jobs in 2024 include cybersecurity experts, AI and machine learning specialists, data analysts and scientists, as well as cloud and blockchain engineers. The ICT labor market in Albania seems to perfectly reflect the EU ICT labor market dynamics.

29 [https://ec.europa.eu/assets/rt/d/eis/2024/ec\\_rtd\\_eis-country-profile-al.pdf](https://ec.europa.eu/assets/rt/d/eis/2024/ec_rtd_eis-country-profile-al.pdf)  
30 <https://www.rcc.int/pubs/159/western-balkans-digital-economy-society-index-wb-desi-2022-report>  
31 <https://www.statista.com/statistics/1496217/western-balkans-share-of-ict-employees-by-country/>  
32 <https://wbip.rcc.int/incentives>  
33 [https://www.instat.gov.al/media/ebwma5bq/tregu\\_i\\_punes\\_2024\\_final.pdf](https://www.instat.gov.al/media/ebwma5bq/tregu_i_punes_2024_final.pdf)  
34 [https://databaza.instat.gov.al:8083/pxweb/sq/DST/START\\_\\_PKP\\_\\_PTV/NewPKP0004/table/tableViewLayout1/](https://databaza.instat.gov.al:8083/pxweb/sq/DST/START__PKP__PTV/NewPKP0004/table/tableViewLayout1/)

**Table 1: Top 10 In-Demand ICT Jobs and Skills in 2024**

EU	Albania
1 <b>AI and Machine Learning Engineers:</b> As AI technologies continue to transform industries, there's a growing demand for engineers who can develop intelligent algorithms and models.	<b>Software Developers/Engineers:</b> As businesses continue to digitize, there's a growing need for professionals proficient in software development to create and maintain applications.
2 <b>Data Analysts and Scientists:</b> The exponential growth of data has heightened the need for professionals skilled in analyzing large datasets to inform business decisions.	<b>IT Specialists:</b> Experts in managing troubleshooting IT systems are essential, especially with the rise in remote work and cloud computing.
3 <b>Cybersecurity Analysts:</b> With increasing cyber threats, organizations require experts to protect their networks and data, making cybersecurity a critical area.	<b>Web Developers:</b> The expansion of online businesses has led to increased demand for skilled web developers capable of building and optimizing websites.
4 <b>Cloud Engineers:</b> The shift towards cloud computing has led to a surge in demand for professionals who can design, implement, and manage cloud infrastructures.	<b>Data Analysts:</b> Organizations are leveraging data-driven decision-making, creating opportunities for professionals adept at interpreting complex datasets.
5 <b>DevOps Engineers:</b> The integration of development and operations to streamline workflows has made DevOps expertise highly sought after.	<b>Cybersecurity Analysts:</b> With rising cyber threats, there's a critical need for specialists who can protect networks and data from breaches.
6 <b>Software Developers:</b> Core programming skills remain fundamental, with software development roles constituting a significant portion of job postings in countries like Italy, Germany, France, and the UK.	<b>Artificial Intelligence (AI) and Machine Learning Specialists:</b> The integration of AI into various sectors has heightened the demand for experts who can develop and manage AI-driven applications.
7 <b>Big Data Specialists:</b> Professionals adept at managing and analyzing vast amounts of data are crucial for businesses aiming to leverage data-driven insights.	<b>Network Administrators:</b> As companies expand their digital infrastructure, professionals who can maintain and secure networks are increasingly valuable.
8 <b>Internet of Things (IoT) Specialists:</b> As IoT devices proliferate, there's a need for experts who can develop and manage interconnected systems.	<b>UI/UX Designers:</b> The focus on user-centered design has led to a surge in demand for designers who can enhance user experiences across digital platforms.

Source: Techopedia (2024)

Outdated skills are often associated with older technologies that are being phased out, while emerging skills are driven by technological advancements and evolving industry needs. Staying up to date with these trends is essential for professionals aiming to remain relevant in the ICT field.

35 [https://www3.weforum.org/docs/WEF\\_Future\\_of\\_Jobs\\_2023.pdf](https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf)  
 36 <https://www.techopedia.com/top-in-demand-tech-jobs>

**Table 2: Potentially Outdated ICT Jobs and Skills**

EU	Albania
1 <b>Legacy System Administrators:</b> With the adoption of modern technologies, roles focused on maintaining outdated systems are diminishing.	<b>Legacy System Administrators:</b> Professionals specializing in outdated systems, such as mainframes or obsolete programming languages, may find fewer opportunities as companies modernize their IT infrastructure.
2 <b>Data Analysts and Scientists:</b> The exponential growth of data has heightened the need for professionals skilled in analyzing large datasets to inform business decisions.	<b>Hardware Technicians for Standalone Devices:</b> With the shift towards cloud computing and integrated systems, the need for technicians focused solely on standalone hardware maintenance is diminishing.
3 <b>Manual Quality Assurance Testers:</b> The rise of automated testing tools is decreasing reliance on manual software testing positions.	<b>Traditional Network Engineers:</b> The advent of software-defined networking (SDN) and automated network management tools reduces the demand for conventional network engineering roles.
4 <b>Data Entry Clerks:</b> Automation and advanced data processing software are phasing out roles centered on manual data entry tasks.	<b>Manual Quality Assurance Testers:</b> The rise of automated testing tools is decreasing the reliance on manual testers for software quality assurance.
5 <b>Telecommunications Equipment Installers:</b> Advancements in wireless and cloud communication technologies are reducing the demand for traditional telecom equipment installation roles.	<b>Data Entry Clerks:</b> Automation and advanced data processing software are phasing out roles centered on manual data entry tasks.
6 <b>Desktop Support Specialists:</b> The increase in mobile device usage and remote work solutions is lessening the need for desktop-specific support roles.	<b>Telecommunications Equipment Installers:</b> As wireless and cloud-based communication technologies advance, the need for traditional telecom equipment installation is declining.
7 <b>Print Media Specialists:</b> The digitalization of media consumption is leading to a decline in roles focused on traditional print media technologies.	<b>Desktop Support Specialists:</b> The increase in mobile device usage and remote work solutions is reducing the demand for desktop-specific support roles.

While certain roles may be becoming outdated, ICT professionals can adapt by upskilling or reskilling to meet current market demands. Continuous learning and staying informed about technological advancements are essential for maintaining relevance in the evolving ICT landscape.

CEDEFOP (2023)<sup>37</sup> analysis highlights that professionals in technology and IT development sectors need to continuously develop their skills and knowledge to stay competitive in the labor market. IT developers, for example, frequently need to learn new programming languages. A worldwide developer survey revealed that two-thirds of developers must learn a new programming language at least once per year. ICT professionals need to design and oversee the implementation of customized solutions for businesses across various sectors, from agricultural farms using precision agriculture and sensors to manufacturing firms managing energy consumption and small retailers developing their personal apps.

However, AI adoption in Europe remains relatively limited. For AI to make a significant impact, more companies will need to integrate it. According to Eurostat, 8% of EU companies – most of them in the ICT sector (30.4% of large EU companies) – were using AI technologies in 2023. Significant variations exist among countries:

<sup>37</sup> [https://www.cedefop.europa.eu/files/9188\\_en.pdf](https://www.cedefop.europa.eu/files/9188_en.pdf)

<sup>38</sup> [https://reports.weforum.org/docs/WEF\\_Future\\_of\\_Jobs\\_Report\\_2025.pdf](https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf)

Denmark, Portugal, and Finland lead the way, with over 15% of companies reporting the use of at least one AI technology. Therefore, to enhance AI utilization, knowledge of programming languages, along with libraries and frameworks such as TensorFlow, NumPy, SciPy, Scikit-learn, PyTorch, and Apache Spark, is crucial.

The WEF Future of Jobs Report 2025<sup>38</sup> ranks technological change, particularly the broadening of digital access, as the most important trend driving business transformation, according to 60% of surveyed employers. Within technological change, “AI and information processing technologies” are expected to have the greatest impact, with 86% of respondents citing them, followed by “robots and autonomous systems” (58%), and “energy generation, storage, and distribution” (41%). Since the release of ChatGPT in November 2022, investments in AI have surged nearly eightfold. The report emphasizes that technological development should focus on enhancing human capabilities rather than replacing them. However, without proper decision-making frameworks, economic incentive structures, and possibly government regulations, there is a risk that technological advancements could focus on replacing human work, leading to increased inequality and unemployment. A significant increase in Generative AI training has been observed among both individual learners and enterprises. While the drivers for training vary by country, the report concludes that individuals tend to focus on foundational knowledge-building, while organizations prioritize training that delivers immediate productivity gains in the workplace.

## ICT and education

**European developments.** EU countries are addressing the ICT supply and its match to ICT labor market needs focusing mainly on education and training initiatives (specialized ICT programs, revisiting education curricula to emphasize STEM from an early age, and short-term coding boot camps to up skill workers quickly); Upskilling and reskilling workforce (Lifelong Learning Programs, Public-Private Partnerships by working with tech companies to provide training and certification programs); Industry Collaboration and Innovation Hubs (Tech Hubs and Clusters to support startups and innovation);

EU has a roadmap for ICT learning in the education system aligned with the Digital Education Action Plan (2021-2027<sup>39</sup>), designed to equip students with digital skills from an early age and prepare them for the evolving job market. The general framework includes:

<sup>39</sup> <https://education.ec.europa.eu/focus-topics/digital-education/plan>

**Table 3: General Framework of the ICT learning roadmap**

Early Education (Primary School - Ages 6-12)	Introduction to Digital Literacy; Computational Thinking & Basic Coding; STEM Awareness;
Secondary Education (Ages 12-18) General and Vocational	<b>General: Expanding Digital &amp; ICT Skills; Advanced Coding &amp; Programming; Participation in coding challenges and competitions; STEM and Robotics Integration.</b> <b>Vocational ICT Pathways.</b>
Higher Education & Professional Training (Ages 18+)	<b>University ICT Programs; Lifelong Learning &amp; Reskilling; Collaboration with Industry.</b>

Each EU country tailors ICT learning based on local policies, but many follow the DigComp Framework, which defines key digital competencies in Information and data literacy, Communication and collaboration, Digital content creation, Safety and cybersecurity and Problem-solving with technology.

**ICT learning hours and education approach.** The number of hours per year dedicated to ICT learning in the pre-university system (primary and secondary education) varies across EU countries. Based on best practices and recommendations from the EU Digital Education Action Plan (2021-2027) and national curricula, the following might be an optimal allocation of ICT learning hours:

**Table 4: The optimal number of ICT learning hours in EU Pre university education**

Education Level	Age Group	ICT Hours/Week	Total Hours/Year
Primary Education (Basic ICT & Digital Literacy)	6-12 years	1-2	40-80
Lower Secondary Education (Basic Coding & STEM ICT Integration)	12-15 years	2-3	80-120
Upper Secondary Education (Advanced Coding, AI, Cybersecurity, ICT Career Tracks)	15-18 years	3-4	120-160
Vocational ICT Education (Technical Training & Specialization)	15-18 years (optional)	5+	200-300

There are two main EU education approaches regarding ICT education: **Integrated ICT approach**, which encourages digital literacy, more time for practice, real-world application, and flexibility and cost effective because there is no need for specialized teachers and separate ICT infrastructure. Meantime it is associated with inconsistent learning, lack of depth, teacher dependency and assessment challenges; and **Standalone ICT courses**, which are structured learning, deeper skill development, easier assessment, specialized teachers and preparation for ICT careers, but the costs are higher, the practical application limited, and less time to practice.

In primary education, ICT is often integrated as a tool for learning across different subjects rather than being taught as a separate subject. Implementation of standalone ICT subjects is more prevalent at the secondary

level. Leading countries in ICT education are Estonia, Finland, and UK. Estonia known for international students studying there, 70% of international ICT students employed during studies and remain after graduation. The education system cultivates an innovation and entrepreneurial mindset which has positioned Estonia as a “startup” nation with a high-tech, high-skill economy that attracts both local and international investments.

**IT infrastructure standards for IT learning.** EU countries have defined the IT infrastructure standards in their education systems, which include:

- **Hardware & Devices:** 1 device-to-student ratio by providing laptops, tablets, or hybrid devices that support learning management systems (LMS), multimedia, and online collaboration tools;
- **Network & Connectivity:** Every school should have minimum 1 Gbps broadband and campus-wide Wi-Fi 6/6E coverage;
- **Digital Learning Platforms & Software:** E-Learning & LMS (Learning Management Systems) - Platforms like Moodle, OpenEdu, and national digital portals and AI-Based Adaptive Learning - AI-powered platforms to personalize education;
- **Cybersecurity & Data Privacy Standards:** General Data Protection Regulation (GDPR)-compliant digital security infrastructure;
- **Smart Classrooms & Emerging Technologies:** AR/VR Learning Labs, IoT Integration, Blockchain-Based.

In addition, two new standards are recommended lately to support both in-person and remote education which are 100% cloud adoption for education platforms & administrative operations (cloud platforms or data storage, access to learning resources, and digital assessments, integration of virtual learning environments) and Cost-efficient, green & scalable ICT infrastructure (Future-proof IT infrastructure, Scalable cloud services and **virtualization** support the expansion of digital resources without requiring heavy physical infrastructure).

**Bridging ICT Education & Labor Market Needs.** The following conclusions are derived in EU countries: Basic ICT literacy should be universal for all job roles; Intermediate skills (coding, cloud, cybersecurity awareness) should be taught in secondary education & vocational training; Advanced ICT specializations (AI, software engineering, data science) should be targeted for high-tech job markets; Lifelong Learning & Up skilling: Employees need continuous ICT training through online courses (Coursera, Udacity, and LinkedIn Learning).

The education curricula currently fall short in Meeting Labor Market Needs because Slow Adaptation to Emerging Tech (Curricula do not keep up with AI, cloud, and cybersecurity trends); Limited Practical Learning (Most ICT programs focus on theory over hands-on coding, problem-solving, and real-world projects); Lack of Industry Collaboration – Universities and schools do not integrate enough employer-led training, internships, or industry certifications (e.g., AWS, Cisco, Google); Unequal Access to ICT Resources – Some schools (especially in rural areas) lack funding for advanced computing infrastructure, AI labs, or cloud-based learning platforms. It is concluded that at the current stage the curricula are sufficient for basic digital skills, but are partially sufficient for Programming & STEM skills and insufficient for AI, cybersecurity, and cloud.

**Developments in Albania.** The subject of Informatics was included in the pre-university education system in the year 2000 and afterward reforms have changed significantly the integration of informatics in school curriculum. Details related to the Informatics curriculum during the periods 2000–2004, 2004–2013, 2013–2021, and 2021–2024 are provided in the table below.

**Table 5:** The developments in IT curriculum in Pre university education in Albania

2000-2004 (130 hours, Grade 11 and 12); Ready for the labor market in 2012 and 2016
2004–2013 (249 hours, Grade 7-12); Ready for the labor market in 2016 and 2020
2014–2021 (426 hours, Grade 4 to 12); Ready for the labor market in 2024 and 2028
2021–2024 (ICT in schools equipped with Smart Labs, Grade 1-3); Ready for the labor market in 2033 and 2037

## EU-Albania Comparison

**Table 6:** The ICT knowledge received in different levels of EU and Albanian education system

European Union		Albania	
Early Education (Primary School – Ages 6-12)	Introduction to Digital Literacy (Basic use of computers, tablets, and the internet, understanding online safety, digital ethics, and responsible online behavior); Computational Thinking & Basic Coding (Introduction to problem-solving using logic and patterns, Beginner-friendly programming tools (e.g., Scratch, Blockly); STEM Awareness (Hands-on activities and games to spark interest in technology);	Early Education (Primary School – Ages 6-12)	Ages 6 to 8 (only in schools equipped with SMART LABS): World of Computers; Introduction to Multimedia; Computational Thinking and Coding; Safe Use of Computers  Ages 9 and 10: World of Computers; Digital Data Processing; Creativity and Programming; Web/Internet Searching; Internet Safety and Safe Computer Use  Ages 11 and 12: World of Computers; Digital Text Processing and Data Analysis; Web/Internet Searching and Email; Digital Publishing and Internet Safety; Digital Presentation
Secondary Education (Ages 12-18)	Expanding Digital & ICT Skills (Deeper knowledge of software applications, digital collaboration tools, Introduction to data privacy, cybersecurity, and media literacy); Advanced Coding & Programming (More complex coding languages (Python, Java, C++); Participation in coding challenges and competitions (e.g., EU Code Week); STEM and Robotics Integration (Robotics and IoT (Internet of Things) projects, AI and Machine Learning basics).	Secondary Education (Ages 12-18)	Ages 13 to 15: World of Computers; Digital Text Processing and Data Analysis; Web/Internet Searching and Email; Digital Publishing and Internet Safety; Digital Presentation;  Ages 16 and 17 - World of Computers; Digital Data Processing; Web Programming; JAVA Programming; Programming and Algorithmic;  Age 18: World of Computers; Algorithmic and Programming; Basics of Databases and Their Management; Data Transmission, Networks, and the Internet; Application, Software, and Systems Development;
Secondary Education (Ages 12-18) Vocational	Vocational ICT Pathways (Specialized vocational programs offering certifications in IT, networking, cybersecurity; Collaboration with tech companies for internships).	VET Level of qualification AQF II, IV	ICT, Data networks, Programming, ICT users' support, Website development, Multimedia, Software Informatics Engineering
Higher Education & Professional Training (Ages 18+)	University ICT Programs (Bachelor's and Master's degrees in Computer Science, AI, Data Science, Cybersecurity; Research-driven ICT innovation programs); Lifelong Learning & Reskilling (Adult training programs for digital transformation, MOOCs (Massive Open Online Courses) and e-learning platforms (Coursera, Udacity, EIT Digital); Collaboration with Industry (Internships, apprenticeships, and real-world ICT project integration, Erasmus+ programs for international digital education exchange).	HE–Bachelor and Master degree	Informatics engineer, Telecommunication engineer, Geoinformatics engineer, Software engineer, Information technology, AI and optimization, Mathematic engineer in system analysis, Economics Informatics, Informatics, Data science and AI, Business informatics, Information systems in economy, Information security, Computer engineering, Applied informatics, Cybersecurity in defense, Computer science, Robotics engineering and mechatronic, Applied computer science, Mathematics and Informatics, Modern systems of telecommunication, Advanced software development
		VET centers	Digital skills, Digital photography, Graphic design, Digital marketing, Web design
		Training institutions	Software testing, Java, Python, Javascript, Data science, DevOps, Cybersecurity, Database SQL, Fullstack development, AI, Advanced programming, IOS & Android Development, Computer science, Machine Learning, Back end and Front end Development, PHP, etc.

Teacher training on the use of ICT is essential to improve their professional skills and to ensure they are prepared to use modern technologies in the classroom. For this purpose, the Accreditation Commission for Training Program Modules (ACTP) has accredited a significant number of modules in the ICT field over the years as follows:

- 2012-2016: accredited about 75 modules in the ICT field.
- 2017-2021: accredited about 35 modules in the ICT field.
- 2022-2026: accredited about 71 modules in the ICT field.

Providers of teacher training in ICT are primarily public and private higher education institutions (HEIs), private entities whose statute includes the development of the continuous professional development of educational staff, foundations, non-profit organizations, NGOs, the Quality Assurance Agency of Pre-University Education (QAAPE), the Educational Services Center, the National Agency for Pre-University Education (NAPE), and professional networks.

The number of beneficiaries in ICT training has significantly increased from 2020 onward (see Table 8), with 29,559 beneficiaries in 2024, compared to 1,013 beneficiaries in 2018. The COVID-19 pandemic reshaped the use of ICT in teaching and learning. It increased the demand for trained teachers to use online platforms and digital tools to manage teaching and support the teaching process in new conditions. In this context, the platform “akademi.al” was created. Between 2021 and 2023, the number of beneficiaries from ICT training was around 38,086 beneficiaries across all of Albania. This increase in teacher training in ICT came due to interventions in infrastructure and the creation of the Management System of Pre University Information (SMIP) platform. During 2022-2023, when SMIP and technological applications such as video projectors, smart boards, computers, software, the internet, mobile tablets, etc., were introduced into the education system, ICT became essential for the teacher’s work.

In 2024, one of the key priorities of the Ministry of Education and Sports was the digitalization of education. For this reason, the Ministry of Education and Sports (MoES), with the support of the Quality Assurance of Pre-University Education (QAAPE), Faculties of Education, and all education partners, developed the National Teacher Development Program (PKZHM).

# 2. ICT LABOR MARKET DEMAND AND SUPPLY

## 2.1 ICT LM demand - main Findings

### 2.1.1 General findings on ICT sector

The demand for ICT employees in this study encompasses the following categories: (i) private companies offering ICT services, (ii) private sector companies employing at least one ICT professional, (iii) public administration institutions/organizations, and (iv) the self-employed individuals working in ICT roles (as outlined in the full methodology provided as Annex). The framework and the survey's sample of these entities, is divided into two main groups: Group A: includes ICT employers from both, public and private sectors, surveyed through face-to-face interviews based on questionnaire. Group B: consists of self-employed ICT professionals, surveyed via an online platform using a short version of the same questionnaire (see Table 9).

**Table 7:** Original FRAME and SAMPLE composition by economic activity

FRAME		
Group A: ICT employers		Group B: Self-employed ICT
Subgroups of population based on economic activity	Number	ICT businesses with 0 or 1 employee
ICT providers (NACE code 61,62,63)	506	4,016
Enterprises/ organizations with at least one ICT profile employee (including public enterprises), excluding major public administration.	3,506	
Major public administration domains with at least one ICT profile employee	133	
<b>Total</b>	<b>4,145</b>	<b>4,016</b>
SAMPLE		
Group A: ICT employers		Group B: Self-employed ICT
Subgroups of population based on economic activity	Number	ICT businesses with 0 or 1 employee
ICT providers (NACE code 61,62,63)	290	4,016
Enterprises/ organizations with at least one ICT profile employee, excluding major public administration	410	
Major public administration domains with at least one ICT profile employee	133	
<b>Total</b>	<b>833</b>	<b>4,016</b>

During the survey fieldwork, 97 Businesses and Institutions (B&I) out of 833 under Group A, or 11.6%, refused to answer or declined to participate. This refusal was more prominent in Tirana compared to the regions. Additionally, 30 B&I (3.6%) were found to have closed or suspended operations; and 109 active B&I (13.1%) that were originally included in the survey frame, under the criteria “with at least one employed ICT professional”, reported to have no ICT job positions at the time of the field work, potentially due to outsourcing their ICT services to external providers). The number of businesses utilizing outsourced ICT services accounted for 36.5% of the frame (1,513 B&I).

Furthermore, a cluster of 18 businesses in the sample (2.2%), representing 207 businesses in the Frame, transitioned from being ICT service consumers to ICT service providers after raising ICT services to their primary economic activity. These businesses were still included in the sample, although under different category.

Summarizing, 597 B&I in total (71.7% of the initial sample) successfully completed the survey, corresponding to a frame of 2,512 B&I (being active and either responding or refusing, excluding closed or passive ones, and B&I without internal ICT employees/outsourcing ICT services).

To address refusals, statistical weights were adjusted further based on the strata of *employee numbers, geographical location, and economic sector*. These adjustments ensured that the sample results be accurately extrapolated to represent the entire population.

**Table 8:** Information on adjusted SAMPLE and FRAME for Group A – the ICT employers

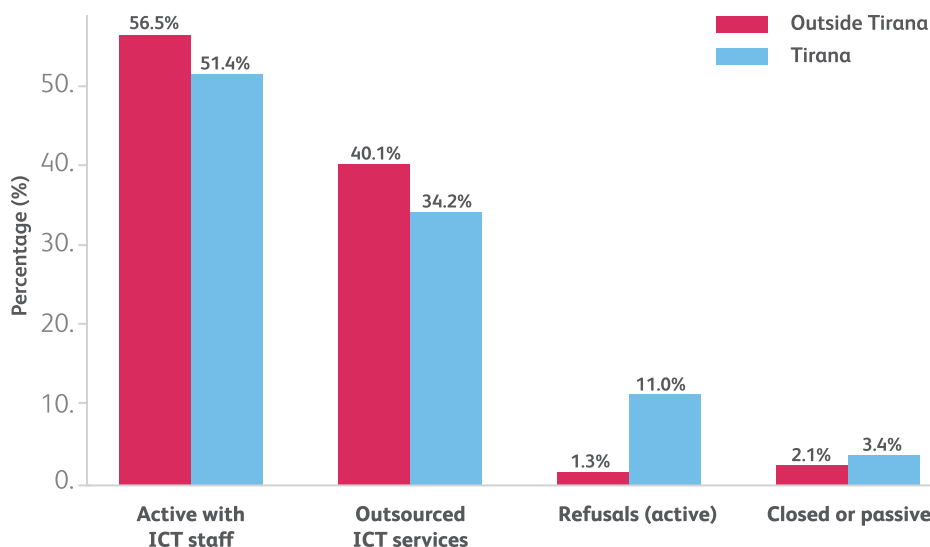
Status of questionnaire	Sample			Total		Frame
	ICT providers	ICT consumers	Major public administration	number	share	
Sampled	290	410	133	<b>833</b>	100.0%	<b>4,145</b>
Changed the main activity	+18	-18				
Refusing to answer (active)	54	43		97	11.6%	298
Outsourced ICT (no internal ICT staff)		109		109	13.1%	1,513
Closed or passive	20	10		30	3.6%	120
Active with ICT staff	234	230	133	<b>597</b>	<b>71.7%</b>	2,214
<b>Adjusted Frame (active + refusal)</b>						<b>2,512</b>

*Note: Refusals are included in the adjusted frame as ICT active businesses with staff. The analysis concluded that the adjusted frame is representative for the overall ICT labor demand.*

As provided above, there are 1,513 B&I utilizing outsourced ICT services, while the remaining B&I rely on ad-hoc solutions managed by non-IT staff. As a result, a share of the ICT workforce has transitioned from businesses in traditional industries to ICT service providers. According to the survey’s experts’ team, several factors have contributed to this shift, including: Expansion of Cloud Services (the expertise and time dedication to manage IT systems have increasingly moved from local staff to cloud-based solutions); Rising Salaries in the IT Market

(higher salaries for IT professionals have made it less cost-effective for businesses with modest IT needs, to maintain in-house IT experts); Employee Preferences (ICT professionals are increasingly oriented towards companies with established IT departments). No significant differences were found between Tirana and the regions regarding the distribution of businesses with ICT staff or those utilizing outsourced ICT services.

**Table 9:** Distribution of the status of interviews extrapolated in the original Frame



All registered self-employed ICT professionals (4,016) under Group B were initially contacted using the contact details in the Business Register through a shortened version of the questionnaire sent electronically, but the response rate was very low. As a result, it was decided to contact every 20th business entry by phone to verify the status of the activity. In total, 225 phone calls were made.

Out of those contacted, 38.6% of self-employed ICT professionals were engaged in ICT services, either as small businesses or freelancers. The largest share of respondents (40.4%) confirmed they were recently employed by ICT companies. Consequently 1,624 ICT professionals from the initial frame are registered as small businesses, while also working as employees under employment or service contracts. To avoid duplication, this subgroup was excluded from the adjusted frame, as data on external and part-time employees is already covered under the ICT Employers' Survey (Group A). The adjusted frame for freelancers thus resulted in 1,553. A shortened version of the questionnaire was then sent to these self-employed ICT professionals via the online platform, with 87 completed questionnaires returned.

**Table 10:** Distribution of the status of interviews in Sample, Group B – the ICT self-employed

Changed the economic activity	25	446	11,1%	
Closed the activity	22	393	9,8%	
Employee in an ICT company	91	1,624	40,4%	
Small business	28	500	12,4%	500
Freelancer	59	1,053	26,2%	1,053
<b>Total</b>	<b>225</b>	<b>4,016</b>	<b>100%</b>	<b>1,553</b>

In total there are 684 answers (597+28+59) from sampled B&I that were used to extrapolate the results in the Frame. The adjusted frames for Group A and Group B ensure to cover almost the entire population of B&I, as well as the self-employed professionals. It results that **a total of 22,972 ICT employees are engaged in the ICT labor market in 2024.**

The employees working for the B&I and as self-employed ICT professionals in the sample represent 39.6% of the total number of employees in the Frame, which is a high representation ratio for a national survey.

**Table 11:** Distribution of adjusted Frame (Group A+ Group B) by size of the ICT team

Size of ICT team in the B&I	Sample		Adjusted Frame		Sample representation ratio ICT employees in Sample ICT employees in Frame
	B&I	Employees	B&I	Employees	
Freelancer (1)	59	59	1,053	1,053	5.6%
1 to 9	426	1,360	2,537	6,617	20.6%
10 to 49	164	3,391	409	8,389	40.4%
50+ ICT	35	4,293	66	6,913	62.1%
<b>Total</b>	<b>684</b>	<b>9,103</b>	<b>4,065</b>	<b>22,972</b>	<b>39.6%</b>

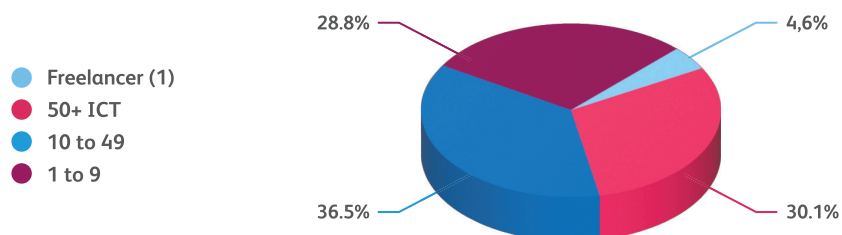
## ICT employment is predominantly concentrated in medium and large- sized B&I (66.6%)

B&I<sup>40</sup> with 1–9 ICT-profile employees represent the majority (62.4%) of the total within the frame, followed by freelancers, who make up 25.9%. A key distinction between freelancers and single-employee businesses is their operational structure. Unlike freelancers, single-employee businesses typically operate from a fixed location, engage in consistent types of activities, and maintain a steady client base. This stability gives these businesses a greater growth potential, both in terms of activity and employment.

<sup>40</sup> [https://www.akafp.gov.al/wp-content/uploads/2023/08/SKILLS-NEEDS-ANALYSIS-IN-THE-ICT-SECTOR-IN-ALBANIA-%E2%80%94-2022\\_compressed.pdf](https://www.akafp.gov.al/wp-content/uploads/2023/08/SKILLS-NEEDS-ANALYSIS-IN-THE-ICT-SECTOR-IN-ALBANIA-%E2%80%94-2022_compressed.pdf)

B&I with 10–49 ICT employees represent the largest share of the ICT workforce, accounting for 36.5% of the total. The actual number of freelancers in the sector is estimated to be 1,053 individuals, comprising 4.6% of the total ICT workforce in Albania.

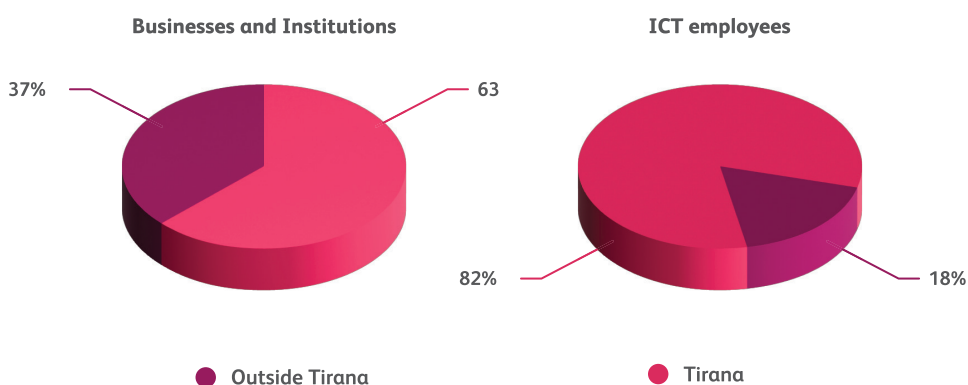
Figure 5: Distribution of the B&I according to the number of ICT staff



## Tirana overwhelmingly dominates ICT employment

82% of ICT employment is concentrated in Tirana in 63% of B&Is, while only 18% is found to be located in the rest of the country. This concentration presents significant challenges for the sector. The limited presence of ICT professionals outside of Tirana forces many businesses in other regions to rely on services from specialists based in the capital city – a business approach that is both costly and inefficient. Simultaneously, young ICT talents from across the country are increasingly oriented towards Tirana, seeking better professional opportunities and a more dynamic ICT environment.

Figure 6: The distribution of ICT B&I and ICT employment based on location



Nearly every B&I within the frame located outside Tirana operates with a small ICT staff (96% of them). Only 4% of B&Is outside Tirana employ ten or more ICT professionals.

**Table 12:** Distribution of the B&I and number of ICT employees by location and size of ICT team

Size of ICT team in the B&I	B&I		Employees	
	Outside Tirana	Tirana	Outside Tirana	Tirana
Freelancer (1)	26.0%	25.9%	9.7%	3.5%
1 to 9	70.0%	57.9%	58.8%	22.4%
10 to 49	3.9%	13.7%	27.4%	38.5%
50+ ICT	0.1%	2.5%	4.1%	35.6%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

ICT employment is 90.3% in the private sector and 9.7% in the public sector

There are in total 294 state-owned enterprises (161) and public institutions (133) with at least one ICT employee, representing 7.2% of the B&Is in the frame and 9.7% of the ICT workforce.

**Table 13:** Distribution of the B&I and number of ICT employees by ownership status

Ownership	B&I		Employees	
	number	share	number	share
Private	3,771	92.8%	20,750	90.3%
Public	294	7.2%	2,222	9.7%
<b>Total</b>	<b>4,065</b>	<b>100.0%</b>	<b>22,972</b>	<b>100.0%</b>

## Finance and Media with the highest concentration of ICT professionals

There are 12,501 ICT employees working in businesses providing ICT services under the “Information Technology and Telecommunication” sector (ICT providers), or 54.5% of the total ICT workforce, which is the largest segment of the labor market. The second-largest sector, “Professional Services,” employs 2,399 ICT professionals, accounting for 10.4% of the total ICT workforce, with a concentration in call centers and security companies. The third-largest sector is the “Public Sector, Health, Education, Arts, and Social Activities,” employing 10.2% of the total ICT workforce.

The highest concentration of ICT professionals is in the “Financial and Insurance Activities” sector, with an average of 16.3 ICT employees per business or institution, followed by the “Media, Broadcasting, and Publishing” sector, with an average of 8.4 ICT employees per business or institution.

**Table 14:** Distribution of the B&I and number of ICT employees by location and size of ICT team

Economic sector of main activity	B&I		Employees		Employees in one B&I	
	number	share	number	share	average	maximum
Industry and Construction	279	6.9%	1,068	4.6%	3.8	88
Trading, Transport, Repairing, Food and Accommodation	409	10.1%	1,758	7.7%	4.3	101
Media, Broadcasting and Publishing	171	4.2%	1,438	6.3%	8.4	347
<b>Information Technology and Telecommunication (ICT providers)</b>	<b>2,219</b>	<b>54.5%</b>	<b>12,501</b>	<b>54.4%</b>	<b>5.6</b>	<b>532</b>
Financial and Insurance activities	91	2.2%	1,476	6.4%	16.3	157
Professional services	388	9.6%	2,399	10.4%	6.2	134
Public sector, Health, Education, Arts and Social activities	507	12.5%	2,332	10.2%	4.6	196
<b>Total</b>	<b>4,065</b>	<b>100.0%</b>	<b>22,972</b>	<b>100.0%</b>	<b>5.7</b>	<b>532</b>

Note: Based on NACE classification, ICT, Media, Broadcasting and Publishing are classified as one economic sector under "J – Information and Communications".

## Young subsector of ICT providers

The large majority of ICT providers (84.7%) are established last 10 years, employing 67% of the total ICT workforce engaged in the ICT service provision sector. ICT providers that have been in business for more than 10 years employ one-third (33%) of the ICT workforce in this sector.

**Table 15:** Distribution of the ICT providers by the time of establishment

Age	ICT providers		Employees	
	number	share	number	share
Startup (0- 3 years old)	743	33.5%	1,718	13.7%
4-5 years	662	29.8%	2,442	19.5%
6-10 years	475	21.4%	4,215	33.7%
Over 10 years	339	15.3%	4,126	33.0%
<b>Total</b>	<b>2,219</b>	<b>100.0%</b>	<b>12,501</b>	<b>100.0%</b>

## Matured sector of ICT service provision

Following the rapid expansion of the ICT sector from 2010 to 2020, the period between 2021 and 2024, in terms of employment growth, has marked a maturation phase. While the sector continues to grow, the focus has shifted towards internal transformation and improving operational efficiency. This conclusion derives from the comparison of data from INSTAT, this survey and the data published under SNA in ICT sector 2021<sup>41</sup> at sectorial basis.

41 [https://www.akafp.gov.al/wp-content/uploads/2023/08/SKILLS-NEEDS-ANALYSIS-IN-THE-ICT-SECTOR-IN-ALBANIA-%E2%80%94-2022\\_compressed.pdf](https://www.akafp.gov.al/wp-content/uploads/2023/08/SKILLS-NEEDS-ANALYSIS-IN-THE-ICT-SECTOR-IN-ALBANIA-%E2%80%94-2022_compressed.pdf)

Between 2021 and 2024, the total number of ICT professionals in Albania increased modestly by only 5% (an addition of 1,127 employees). The slight growth of 5% suggests that the continuous claimed vacancies are very optimistic compared to the recruitment reality in the sector. Such growth rate might be partly constrained by the emigration of young specialists.

However, significant internal transformation in the sector has occurred in two main directions:

1. ICT providers are transitioning from other sectors of the economy: More than 200 businesses once specialized in trading or professional services are now shifting their focus to ICT services as their primary economic activity. Consequently, these companies have transitioned from being ICT consumers into ICT providers.
2. “Migration” of Professionals: ICT professionals are moving from other industries to ICT service providers. This shift is driven by the growing trend of businesses outsourcing their ICT needs –either partially or fully – to specialized ICT firms. Additionally, the rise of cloud-based services such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) has further contributed to this migration.

The main drivers of the IT service providers’ sector (NACE sector J62-63 only) have experienced a remarkable increase in the number of ICT professionals they employ, growing from 4,679 to 10,872 employees (an increase by 132%) over the period 2021-2024. Their share of ICT employment at the national level of total ICT employees has risen significantly, from 21.4% to 47.3%.

On a broader scale, the entire information and communications sector (NACE sector J58-63) has doubled its share of the ICT job market, growing from approximately 30% to around 60%. This concentrated growth has enhanced the efficiency and competitiveness of Albania’s IT service providers, enabling them to boost exports of their services and solidify their position in the international market.

**Table 16:** Comparison of number of ICT employees 2024 versus 2021

Data source	Total ICT employees	Information and Communication sector (NACE 58-63)		Providers of IT services (NACE 62 and 63 only)	
		number	share	number	share
SNA IT providers 2021	21,845	6,515	29.8%	4,679	21.4%
INSTAT 2024	22,116	11,244	50.8%	7,095	32.1%
AADF 2024	22,972	13,939	<b>60.7%</b>	10,872	<b>47.3%</b>

## Favorable women involvement in ICT employment

In Albania, women represent 32.1% of the ICT workforce (a total of 7,378 of female employees), which is a notable achievement compared to broader trends observed in the EU (approximately 20% in 2024). While the global ICT sector remains predominantly male-driven due to the historical gender imbalance in technical and engineering roles, Albania stands out for its relatively higher involvement of women in this field reflecting some positive steps made toward gender inclusivity. Efforts to continue promoting gender diversity, particularly in senior roles and technical areas, will be crucial in advancing equality within the Albanian ICT labor market.

Public institutions lead in terms of the number of female ICT staff, with 60.1% of them employing female ICT employees, compared to 36.1% of the businesses in the private sector. However, when looking at the overall employment figures, the share of female ICT employees in both the private and public sectors remains consistent at 32%, highlighting that gender representation in ICT remains balanced across both sectors.

## One fifth of the ICT employees are junior-level professionals

The B&I assessment shows that the majority of ICT employees in Albania are at the intermediate skills level (44.6%), followed by those at an advanced or senior level (35.5%), and junior-level professionals (almost one fifth). Interestingly, the public sector tends to employ fewer junior-level ICT employees, with a higher proportion of senior level professionals compared to the private sector. This could reflect the public sector's preference for experienced professionals, possibly due to the complexity of its ICT needs and better wage hierarchy. The ICT employers have declared that unlike in the other sectors, the young ICT professionals advance very fast in their skills following the fast technological advancement in the ICT sector.

## Top hiring B&I with more than 500 employees

The top employer in the Albanian ICT labor market is a private software development company, which employs 532 ICT professionals. This company is also a leader in hiring female ICT employees, contributing to the sector's growing gender balance. On the public side, the Albanian Radio-Television is the largest employer of ICT professionals, with 347 employees, mainly in technical roles.

Table 17: Employment statistics by gender, level of expertise and ownership

Employment Statistics	Private	Public	Total
<b>Count of businesses (or 100%)</b>	<b>3,771</b>	<b>294</b>	<b>4,065</b>
Businesses employing Females (%)	36.1%	60.1%	37.8%
Businesses employing Males (%)	87.9%	80.0%	87.4%
Businesses employing Juniors (%)	83.7%	48.9%	81.2%
Businesses employing Middle Level (%)	53.0%	75.1%	54.6%
Businesses employing Seniors (%)	68.7%	52.9%	67.5%
<b>Aggregate number of employees (or 100%)</b>	<b>20,750</b>	<b>2,222</b>	<b>22,972</b>
Number of Female employees	6,668	710	7,378
Number of Male employees	14,082	1,512	15,594
Number of Junior ICT employees	4,291	279	4,570
Number of Middle ICT employees	9,217	1,033	10,250
Number of Senior ICT employees	7,242	910	8,152
Number of Female employees (%)	32.1%	32.0%	32.1%
Number of Male employees (%)	67.9%	68.0%	67.9%
Number of Junior ICT employees (%)	20.7%	12.5%	19.9%
Number of Middle ICT employees (%)	44.4%	46.5%	44.6%
Number of Senior ICT employees (%)	34.9%	41.0%	35.5%

**Table 17:** Employment statistics by gender, level of expertise and ownership

Employment Statistics	Private	Public	Total
Highest number of employees in one business	532	347	532
Highest number of Females	240	85	240
Highest number of Males	292	306	306
Highest number of Junior ICT employees	284	35	284
Highest number of Middle ICT employees	160	261	261
Highest number of Senior ICT employees	88	147	147

## “Software development” the largest ICT occupation, dominated by women and young employees

“Software developer” is the largest occupation within Albania’s ICT workforce, comprising 43.7% of the total ICT professionals, with an estimated 10,049 individuals in this role. Notably, female professionals exhibit a stronger preference for the software industry, with 59.8% of women working in software development, compared to 36.1% of men. This indicates a higher representation of women in the subsector of software development, which could reflect both increased interest and opportunities for women in this field.

The second largest group in the ICT workforce is “ICT technicians”, with an estimated 5,030 professionals, representing 21.9% of the total ICT employees. However, this occupation remains overwhelmingly male-dominated, with 4,303 males compared to only 727 females. The gender imbalance in this subsector is a significant reflection of the broader trend in technical and engineering roles within the ICT sector.

“ICT sales professionals” make up a smaller share of the ICT workforce, accounting for only 4.6% of the total. This role, although important, has a relatively limited presence compared to the other ICT subsectors / occupations in Albania.

These statistics highlight the continuing gender disparities in specific ICT occupations, with women more concentrated in software development while facing challenges in other technical roles such as ICT technicians. The higher percentage of women in software development is an affirmative sign for improved gender inclusion in the growing tech industry.

**Table 18:** Number of ICT employees by main groups of ICT job profile / occupations and by gender

ICT profile main groups	Employees		Female employees		Male employees	
	number	share	number	share	number	share
Software or database developer/ analyst/ administrator	10,049	43.7%	4,414	59.8%	5,635	36.1%
System or network engineer / administrator	4,070	17.7%	1,141	15.5%	2,929	18.8%
Electronic / mechatronic / telecommunication engineer	2,757	12.0%	621	8.4%	2,136	13.7%
ICT technicians	5,030	21.9%	727	9.9%	4,303	27.6%
ICT sales professionals	1,067	4.6%	492	6.7%	575	3.7%
<b>Total</b>	<b>22,972</b>	<b>100.0%</b>	<b>7,378</b>	<b>100.0%</b>	<b>15,594</b>	<b>100.0%</b>

In the Albanian ICT workforce, “System or network engineers / administrators” represent the highest share of senior-level employees, with 46.4% of their workforce classified as such. This indicates the fact that these roles tend to require more advanced expertise and experience, likely due to the complexity of managing and maintaining IT infrastructure and networks.

On the other hand, “Software or database developers/analysts/administrators” have the largest relative share of junior-level employees, making up 23.8% of their workforce. This suggests that software development may be an entry point for many ICT professionals, as it often offers opportunities for individuals to gain experience and grow over time into more senior technical roles. The trend also reflects the growing demand for software development professionals, which may attract younger talent looking to build their skills in a rapidly evolving field.

**Table 19:** Number of ICT employees by main groups of ICT job profile and by level of expertise

ICT profile main groups	Junior		Middle		Senior		Total	
	number	share	number	share	number	share	number	share
Software or database developer/ analyst/ administrator	2,392	23.8%	4,162	41.4%	3,495	34.8%	10,049	43.7%
System or network engineer / administrator	505	12.4%	1,677	41.2%	1,888	46.4%	4,070	17.7%
Electronic / mechatronic / telecommunication engineer	319	11.6%	1,389	50.4%	1,048	38.0%	2,757	12%
ICT technicians	1,014	20.2%	2,742	54.5%	1,274	25.3%	5,030	21.9%
ICT sales professionals	186	17.5%	551	51.7%	329	30.8%	1,067	4.7%
<b>Total</b>	<b>4,570</b>	<b>19.9%</b>	<b>10,250</b>	<b>44.6%</b>	<b>8,152</b>	<b>35.5%</b>	<b>22,972</b>	<b>100.0%</b>

## “Higher salaries” is the biggest current employers’ concern in the ICT sector

The B&I in the Frame (3,012 after excluding freelancers) identified “higher salaries” as the most pressing concern regarding their ICT staff, with 39.9% of the B&I highlighting this issue surpassing other traditional concerns, such as the “lack of labor supply,” “insufficient qualifications for middle and senior-level candidates”, and “ICT staff mobility” . As companies face heightened competition for skilled workers, offering competitive salaries has become essential to both attracting and retaining talents, particularly in high-demand subfields. Other key challenges reported by the ICT employers are:

1. Lack of Labor Supply (34.3%): Despite the steady growth in the ICT sector and the increasing number of ICT graduates, many businesses still struggle to find enough qualified professionals to meet their needs. This challenge is particularly severe in specialized fields such as cybersecurity, AI, and machine learning.
2. Insufficient Qualifications for Middle and Senior-Level Candidates (29.2%): Employers report difficulty in finding candidates with the necessary experience for more advanced ICT roles. This challenge may stem from a lack of targeted training programs, as well as the gap between the rapidly evolving demands of the ICT market and the available skills sets.
3. ICT Staff Mobility after being trained (20.7%): While this issue is still a concern, it appears to be less significant than in previous years, possibly due to a more mature ICT labor market and increased efforts by businesses to retain their employees through career development and workplace benefits.

These findings suggest that the ICT labor market in Albania is evolving, with salary competitiveness becoming a key factor in attracting and retaining skilled professionals. As the market matures, companies are focusing more on balancing compensation with other factors such as employee development, job satisfaction, and professional growth opportunities aiming at remaining competitive.

The first three challenges are even more pronounced for public sector institutions. 56.6% of them report concerns over “rising salary demands from ICT staff”. This issue also exacerbates other challenges, as salary disparities drive more candidates toward the private sector, reducing both the quality and quantity of available talents in the public sector.

**Table 20:** The major concerns of employment in the Frame (sorted)

Concerns of employment	Total		Private only		Public only	
	B&I	%	B&I	%	B&I	%
1. Demands for higher salaries than budgeted ones	1,201	39.9%	1,034	38.1%	166	56.6%
2. Lack of labor supply	1,033	34.3%	894	32.9%	139	47.2%
3. Insufficient qualification for middle and senior level candidates	879	29.2%	767	28.2%	113	38.3%
4. People leave after getting trained	623	20.7%	562	20.7%	61	20.8%
5. The Education System doesn't meet the needs for skills on ICT sector	558	18.5%	509	18.7%	50	17.0%
6. Attitude of jobseekers / work culture	508	16.9%	443	16.3%	65	22.0%
7. High fiscal burden regarding employment	247	8.2%	223	8.2%	24	8.2%
<b>Total</b>	<b>3,012</b>	<b>100.0%</b>	<b>2,718</b>	<b>100.0%</b>	<b>294</b>	<b>100.0%</b>

Note: Freelancers excluded from these statistics

In 2024, nearly half of the B&Is excluding freelancers (47.9%) reported to have increased their remuneration funds for ICT personnel. This shift seems to be primarily driven by the growing demand for higher salaries and the need to support the expansion of operations.

#### Regarding ICT staff:

- 23.5% of B&Is reported an increase in the size of their ICT staff over the past 12 months, suggesting for some growth in the demand for ICT professionals.
- 7.2% experienced a decrease in their ICT staff, which is important to consider when interpreting overall labor market trends.

It is essential to interpret these findings with caution, as the reported growth in ICT staff within businesses does not necessarily reflect a net increase in Albania’s aggregate ICT workforce. Some of the growth in the 23.5% of businesses stems from ICT professionals who previously left these entities and now work for businesses that have outsourced their ICT services (as mentioned, businesses that fully outsource ICT services are not included in this survey’s Frame).

**Table 21:** The employment trends of the B&I in the Frame in last 12 months

Concerns of employment	Increasing	Unchanged	Decreasing
Total number of employees	28.2%	63.8%	7.9%
Number of ICT employees	23.5%	69.3%	7.2%
Annual remuneration fund (only for the ICT employees)	47.9%	50.4%	1.7%

Note: Freelancers excluded from these statistics

## An optimistic ICT sector for the near future

38.1% of ICT providers reported an increase in the demand for their services over the past 12 months, while only 7% experienced a decline. The outlook for the next 12 months appears more optimistic, with 51% of businesses in the ICT services providers sector expecting further growth.

Despite this optimistic outlook for the near future, comparisons with responses from 2021 suggest a slightly less favorable trend. In 2021, 54.3% of ICT businesses expressed optimism regarding the growth of demand for their products and services, although in 2024, that figure dropped to 38.1%. Interestingly, businesses' expectations for the sector growth in 2021 were notably high, with 70.2% anticipating a strong growth, still a forecast that did not materialize as expected. This suggests that while businesses are still optimistic for the future, the sector's growth may not meet the same high expectations of previous years.

**Table 22:** Trends of demand for products/services of ICT providers

Trend of demands...	ICT providers questioned in 2024			Questioned in 2021
	Increasing	Unchanged	Decreasing	Increasing
...in the last 12 months	38.1%	54.9%	7.0%	54.3%
...in the next 12 months	51.0%	43.7%	5.3%	70.2%

## An exporting ICT sector

The growing export activity within Albania's ICT providers represents a quite significant achievement, positioning the ICT exports as one of the country's most valuable exports. The fact that 51.1% of ICT providers are involved in exporting their services or products, with 38.8% of their workforce dedicated to export-related activities highlights the sector's potential for growth. This export-driven dynamic offers numerous benefits for Albania, including:

*Economic Growth:* ICT exports have a direct positive impact on the economy by generating foreign exchange, which contributes to the sector itself but also to the Albania's overall economic stability and growth.

*High-Quality Employment:* As the ICT sector offers some of the highest-paying jobs in the country, the export activity plays a crucial role in employing highly skilled professionals. These professionals, in turn, help to

develop more competitive local industries through knowledge transfer and skills enhancement.

*Retention of Talents:* By engaging in export activities, particularly in high-demand international markets such as the U.S. and the EU, Albania retains talented young professionals who might otherwise seek opportunities abroad. The ability to work remotely for international clients allows them to earn competitive salaries while staying in Albania, thus providing benefits for both the individuals and the country.

On the other side, this positive trend faces several challenges:

*Increased Global Competition:* Emerging markets like Latin America and Africa are becoming significant players in the ICT exporting and outsourcing industry. Countries such as Brazil, Mexico, Argentina, Colombia, Nigeria, and Kenya are rapidly developing their tech ecosystems, creating a large-scale competitive threat. These countries often offer lower labor costs, which further intensifies competition pressures for the Albanian ICT providers.

*Rising Domestic Costs:* As wages in the Albanian ICT sector increase, the sector's competitiveness in the global market could be compromised. This issue needs to be carefully managed, especially when competing against countries where labor costs are lower.

Despite these challenges, ICT exports remain a key pillar of Albania's economic strategy, offering significant growth potential. In this context, businesses and institutions must invest in up skilling their workforce and enhancing their offerings to sustain their competitive edge. If Albania's ICT sector loses its comparative advantages, it could jeopardize its position in the international market. Therefore, continuous innovation, skills development, and market adaptation will be essential in particular for sustaining Albania's role as a competitive ICT exporter in the future.

A small but notable share (1.0%) of businesses in other sectors of the Albanian economy (ICT consumers) are also engaged in limited ICT export activities. Although this is a modest share, it signals an increasing awareness and integration of ICT solutions across various industries, further enhancing the sector's contribution to the national economy.

The total human resources dedicated to ICT export services and products in Albania are estimated to be the equivalent of 5,072 Full-Time Employees (FTE), representing 22.1% of the total ICT workforce. This illustrates the importance of ICT exports in the broader context of Albania's economy, and how the sector is emerging as a key driver of growth and development.

It is crucial for policymakers and industry leaders to carefully analyze and monitor the current state of the ICT export subsector, and to promote strategic interventions. Maintaining Albania's comparative advantage in the international market will be key to the sustainability of its ICT exports. As competition increases from emerging markets, the threat of losing that advantage becomes more pressing. To safeguard the future of these businesses, there is a clear need that Albania's ICT providers continue to innovate, maintain their edge, and compete effectively on a global scale.

**Table 23:** Number of B&I that export ICT services/ products and HR engaged in exporting activities

Subgroups	B&I that export ICT services		HR engaged in export services equivalent in full-time ICT employees	
	number	valid %	number	% in subgroup
ICT providers	1,133	51.1%	4,855	38.8%
ICT consumers	19	1.0%	217	2.1%
<b>Total</b>	<b>1,152</b>	<b>28.3%</b>	<b>5,072</b>	<b>22.1%</b>

## 2.1.2 Abilities and skills of existing staff

### “Insufficient knowledge at the recruitment stage” the biggest concern for B&I with lack of skills

Approximately 59% of B&I, excluding freelancers, report that their employees possess the adequate skills. 41% of B&I face a shortage of adequately skilled ICT employees, particularly pronounced among ICT providers, with almost half of them (49.2%) acknowledging this challenge.

The skills gap is consistent across various subgroups, including different geographical regions and ownership types, indicating that this is a national-level concern. This gap poses a significant barrier to the growth and efficiency of ICT providers. As a result, it is crucial for the B&Is, in particular those with 10 or more employees to invest in their employees’ development and adopt targeted recruitment strategies to address this shortfall.

**Table 24:** Distribution of B&I that are facing lack of adequate skills of ICT employees

...is there a lack of skills?	B&I		ICT providers only	Location		Ownership		Size of ICT team	
	number	share		outside Tirana	Tirana	private	public	1 to 9 employees	10 or more employees
Yes, there is a lack of adequate skills	1,235	41.0%	49.2%	1,034	38.1%	166	56.6%	166	56.6%
No, everyone has the right skills	1,777	59.0%	50.8%	894	32.9%	139	47.2%	139	47.2%

Note: Freelancers excluded from these statistics

B&I have clearly identified “the insufficient knowledge at the time of recruitment” as the primary cause for the lack of adequate skills within their ICT teams. This issue is highlighted by 30.8% of B&I in the Frame (still excluding freelancers). The challenge is more pronounced in organizations with ICT teams of 10 or more employees, where 44.5% of B&I report recruitment-related knowledge gaps as a significant problem. A contributing factor to this issue is the trend among ICT providers over the past decade of hiring junior professionals – either recent graduates or those being not yet graduated – particularly in businesses operating within the software industry.

**Table 25:** The employment trends of the B&I in the Frame in last 12 months

Main causes that the staff is not enough skilled	Size of ICT team. Percentage in the group		
	all sizes	1 to 9 employees	10 or more employees
Insufficient knowledge already at the time of recruitment	30.8%	27.6%	44.5%
Lack / insufficient on the job training	1.9%	1.8%	2.4%
Frequent change of jobs / emigration	6.9%	5.2%	14.2%
Insufficient capacity to learn	6.2%	6.8%	3.9%
Lack of motivation to increase qualification	7.7%	6.3%	13.9%
Rapidly advancing technologies (from “Other” option)	1.4%	1.2%	2.1%
<b>Total number of B&amp;I facing lack of adequate skills</b>	<b>41.0%</b>	<b>36.7%</b>	<b>59.6%</b>

Note: The sum of values in each column exceeds the number in the last row because some B&I have selected more than one cause. The Freelancers are excluded from these statistics.

B&I have reported an estimated 2,942 ICT professionals facing skill shortages, which accounts for 12.8% of the ICT workforce in Albania. Regarding lack of professional skills, the ICT roles most impacted by skill shortages are those related to cybersecurity and data analysis / science, with shortages of 25.3% and 24.9%, respectively. Other areas of concern include network security and database design and administration, with shortages of 22.6% and 22.1%. On the other hand, “electronic/mechatronic/automation/telecommunication engineers” and “telecommunication & broadcasting technicians” report the lowest levels of skill shortages, at levels of 4.5% and 4.8%, respectively.

When it comes to soft skills, here referring particularly to the “teamwork” and the “ability to learn on the job”, only 2.7% of ICT employees nationwide are reported to be lacking of. Roles in networking and security face higher challenges with regards to the soft skills, with “network and network security engineers” (7.5%), “cybersecurity specialists” (6.6%), and “ICT technicians” (7.0%) being the most affected by these skills shortage.

**Table 26:** Number of ICT employees for each profile and frequency of those with skills shortage

ICT profile of the main duty	All employees		Employees lacking professional skills		Employees lacking soft skills	
	number	share	number	% to all	number	% to all
ICT services managers and ICT trainers	1,873	8.2%	254	13.6%	59	3.1%
Professional ICT Sales	1,067	4.6%	85	7.9%	41	3.8%
Software developers: mostly Front-End	2,169	9.4%	269	12.4%	26	1.2%
Software developers: mostly Back-End	2,335	10.2%	265	11.3%	15	0.7%
Software engineers / architects	1,495	6.5%	65	4.3%	6	0.4%
Business analysts/ QA/ Testers/ Scrum masters	793	3.5%	90	11.4%	7	0.8%
Devops	833	3.6%	141	17.0%	16	1.9%
Database designers and administrators	871	3.8%	193	22.1%	47	5.4%
Data analyst/ scientist	428	1.9%	107	24.9%	-	-
System engineers / administrators	1,753	7.6%	288	16.4%	39	2.2%
Cybersecurity specialist	430	1.9%	109	25.3%	28	6.6%
Network and network security engineers	931	4.1%	210	22.6%	70	7.5%
Electronic/mechatronic/ automation/ /telecommunication engineer	2,757	12.0%	123	4.5%	61	2.2%
IT operations/ support technicians	2,714	11.8%	593	21.8%	190	7.0%
Telecommunication & broadcasting technicians	2,064	9.0%	100	4.8%	9	0.4%
ICT assemblers and hardware repairers	252	1.1%	34	13.4%	-	-
AI developers and consultants	207	0.9%	17	8.2%	-	-
<b>Total</b>	<b>22,972</b>	<b>100.0%</b>	<b>2,942</b>	<b>12.8%</b>	<b>614</b>	<b>2.7%</b>

## Training and ICT certificates with increased importance in ICT sector

“Staff replacement” is the least favored action to address skills shortages in the ICT sector, with only 10.8% of respondents choosing it. Instead, B&I report to typically adopt a combination of strategies to address skill gaps among their ICT staff. The most common measures include “increased training” (40.5%) and “requesting / encouraging the acquisition of professional ICT certifications” (28.8%). These percentages are relatively higher for the public institutions, where they reach 47.9% and 33.4%, likely due to greater access to financial and technical support for providing training initiatives.

When compared to the SNA in ICT survey conducted in 2021, the current findings highlight a greater focus on “trainings” and the “requirement for professional ICT certifications” over the past three years. Conversely, “staff replacement” and “improvements of recruitment procedures” have seen a considerable decline in their importance (almost halved) as actions undertaken by the B&Is.

**Table 27:** Actions undertaken by B&I to address the skills shortage of existing ICT staff

Actions undertaken to address the skills shortage	Valid % of B&I	Ownership		Questioned in 2021
		private	public	
Increased trainings	40.5%	39.4%	47.9%	31%
Require professional ICT certifications	28.8%	28.2%	33.4%	11%
Find a solution within the enterprise (reorganization)	25.1%	25.5%	22.1%	23%
Outsource services to specialized experts/companies	23.4%	22.4%	30.3%	6%
Improvement of recruitment procedures	15.8%	16.0%	14.4%	30%
Staff replacement	10.8%	9.8%	17.5%	25%

*Note: Valid percentages are calculated over the number of B&I that have declared to have skills shortage. The Private/ Public columns are over the number of Private/Public B&I with skills shortage.*

### 2.1.3 Needs for more Human Resource capacities

The number of ICT providers in Albania, based on NACE codes 61, 62, and 63, is estimated to be 2,219. Additionally, around 326 B&I in other economic sectors also offer ICT services as a secondary activity. In total, there are 2,545 B&I across the country (62.6% of the Frame B&I) providing ICT services and products, either for the local market or for exports.

**Table 28:** Number of B&I offering ICT services in the market

Sector of economic activity	B&I	share
ICT providers	2,219	54.6%
B&I with main activity in other sectors of the economy	326	8.0%
<b>Total</b>	<b>2,545</b>	<b>62.6%</b>

## Albanian ICT providers offering similar services with those in developed countries

The “software industry” dominates among Albanian B&I that provide ICT services and products. A significant share of ICT providers (74.1%) have specialized in offering “software application development”, 50.2% in offering “web design services”, and 37.3% focused on “ERP and CRM design and deployment”, along with other software sector services. Support and Helpdesk services (37.6%) lead the category of other ICT services.

It is important to note that these percentages may be influenced by the substantial presence of the freelancers, many of whom report to be “software developers”. To provide a more accurate assessment, further analysis excluding freelancers is presented later in this report.

The distribution below confirms that ICT service providers in Albania offer the same range of services as those found in developed economies. It is also noteworthy that there is a relatively high number of ISPs and cable TV providers per capita, suggesting lower efficiency in this service.

**Table 29:** Distribution of the B&I offering ICT services in the market, by the group of services

IT services offered to local and export markets	Number of B&I offering the service(s)	
	number	share
1. Software and application development	1,887	74.1%
2. Web designing services	1,278	50.2%
3. Support and Helpdesk for IT services	957	37.6%
4. ERP and CRM design and deployment	950	37.3%
5. Cloud related services	937	36.8%
6. Network engineering and security	712	28.0%
7. Data storage and management. Data backup services	704	27.7%
8. E-Business / E-Commerce	678	26.6%
9. Artificial Intelligence	656	25.8%
10. ICT consulting & audit	654	25.7%
11. Fintech solutions	600	23.6%
12. Operating systems and Virtualization	586	23.0%
13. Digital marketing	554	21.8%
14. Cyber security	549	21.6%
15. Document management services	486	19.1%
16. ICT infrastructure (datacenters, LAN and WAN networks)	481	18.9%
17. ICT education and training	441	17.3%
18. Safety and security system (CCTV, AC, alarm & safety)	434	17.0%
19. Services for hardware products including repairing	429	16.9%
20. Blockchains	271	10.7%
21. ISP and cable TV	219	8.6%
<b>B&amp;I offering at least one ICT service (Total)</b>	<b>2,545</b>	<b>100%</b>

To analyze the frequency of B&I lacking professional skills or capacities for each ICT service offered in the market, it is necessary to exclude freelancers from the previous analysis. Although freelancers are technically classified as B&I, they do not have ICT staff, and none of the surveyed freelancers reported a lack of skills for their business activities.

Excluding freelancers, 42.0% of B&I offering ICT services reported the need for additional staff capacities or skills for at least one of the services they provide. The majority of these B&I offer multiple services, and when considering each service from each individual B&I as a distinct case, the lack of capacity is observed in 20.2% of cases.

Among the ICT services, “software development” has the highest frequency of B&I (20.2%) reporting a lack of related HR capacities, a trend that remains valid even when freelancers get excluded.

**Table 30:** Distribution of the B&I offering ICT services in the market excluding Freelancers

IT services offered to local and export markets	Number of B&I excluding Freelancers that offer the service		B&I that do not and have enough capacities/ skills at the moment to fulfill objectives for such service		
	number [a]	% over total	number [b] sorted	% over total	% on valid group [a]/[b]
1. Software and application development	976	65.4%	301	20.2%	30.8%
2. Web designing services	832	55.8%	205	13.7%	24.6%
3. Support and Helpdesk for IT services	779	52.2%	165	11.0%	21.1%
4. ERP and CRM design and deployment	664	44.5%	151	10.1%	22.7%
5. Cloud related services	670	44.9%	140	9.4%	21.0%
6. Artificial Intelligence	495	33.2%	114	7.6%	23.0%
7. Cyber security	442	29.6%	108	7.3%	24.5%
8. Network engineering and security	605	40.6%	99	6.6%	16.4%
9. Digital marketing	447	30.0%	97	6.5%	21.8%
10. Data storage and management. Data backup services	579	38.8%	84	5.6%	14.4%
11. E-Business / E-Commerce	428	28.7%	80	5.4%	18.7%
12. Fintech solutions	421	28.2%	79	5.3%	18.8%
13. Document management services	450	30.2%	79	5.3%	17.5%
14. Safety and security system (CCTV, AC, alarm & safety)	380	25.5%	74	5.0%	19.5%
15. Blockchains	254	17.0%	70	4.7%	27.7%
16. ICT education and training	298	20.0%	70	4.7%	23.3%
17. ICT infrastructure (datacenters and WAN networks)	392	26.3%	69	4.6%	17.7%
18. Operating systems and Virtualization	497	33.3%	59	3.9%	11.8%
19. Services for hardware products including repairing	429	28.7%	51	3.4%	11.9%
20. ICT consulting & audit	422	28.3%	48	3.2%	11.5%
21. ISP and cable TV	219	14.7%	12	0.8%	5.5%
<b>B&amp;I offering at least one ICT service (Total)</b>	<b>1,492</b>	<b>100%</b>			
<b>B&amp;I that do not have enough capacity for at least one ICT service</b>			<b>626</b>	<b>42.0%</b>	
<b>Average for all services together (weighted)</b>					<b>20.2%</b>

Nearly half of the B&I in the Frame (49.5%, including the freelancers) use “programming technologies” (languages, frameworks, libraries, and tools). Java is the most commonly used programming technology among B&I in the Frame, with 40.4% of B&Is reporting to use it, closely followed by JavaScript (37.4%).

**Table 32:** Number of B&I that operates with programming technologies

Operating with programming language	Number of B&I	Share
Yes, we operate with programming technologies	2,013	49.5%
No, we don't	2,052	50.5%

A total of 340 businesses and institutions, representing 8.4% of the B&I in the Frame, reported the need for additional HR capacities or skills related to programming technologies. The majority of these B&I use multiple programming technologies. When each technology used by individual B&I is treated as a separate case, a lack of capacity is observed in 13.1% of cases. When referring to specific programming technologies, only a small percentage of B&Is (4.6% or less) report a need to enhance their human capacities and skills for any particular programming technology.

**Table 31:** Distribution of the B&I operating with different programming technologies

Programming technologies	Number of B&I operating with programming technologies		B&I that need to increase capacities/ skills in programming technologies to fulfill their objective		
	number [a] sorted	% over total	number [b]	% over total	% on valid group [a]/[b]
1. Java	1,641	40.4%	154	3.8%	9.4%
2. JavaScript	1,521	37.4%	186	4.6%	12.2%
3. PHP	889	21.9%	114	2.8%	12.8%
4. NodeJS	872	21.5%	68	1.7%	7.8%
5. PYTHON	822	20.2%	125	3.1%	15.2%
6. ReactJs	815	20.0%	72	1.8%	8.9%
7. C#	629	15.5%	88	2.2%	14.1%
8. AngularJS	589	14.5%	86	2.1%	14.6%
9. React Native	525	12.9%	57	1.4%	10.8%
10. VueJS	506	12.4%	52	1.3%	10.2%
11. Script Languages – others	503	12.4%	74	1.8%	14.8%
12. C++	478	11.8%	91	2.2%	19.1%
13. Visual Basic	363	8.9%	85	2.1%	23.3%
14. SWIFT	278	6.8%	48	1.2%	17.1%
15. Flutter	263	6.5%	34	0.8%	12.8%
16. Ruby on Rails	231	5.7%	27	0.7%	11.5%
17. SingalR	219	5.4%	41	1.0%	18.9%
18. Objective C	214	5.3%	42	1.0%	19.6%
19. Visual Objects	212	5.2%	43	1.1%	20.5%
20. Delphi	134	3.3%	45	1.1%	33.6%
21. Perl	104	2.6%	16	0.4%	14.9%
TOTAL number of B&I in the Frame	4,065	100%			
B&I that need to increase capacity for at least one programming technology			340	8.4%	
Average for all programming technologies (weighted)					13.1%

A total of 2,002 B&I, nearly half of those in the Frame (49.3%), engage in some level of “database management operations”. While this figure does not indicate the importance of database management as a primary operation, it serves as a reliable indicator of its significant role in daily business operations. MySQL is the most frequently used database technology, with 37.2% of B&I in the Frame reporting to use it. It is followed by PostgreSQL, used by 24.7% of B&I, and Microsoft SQL, reported by 24.1% of them.

**Table 33:** Number of B&I that have operations in database management

Operating with database management...	Number of B&I	Share
Yes, we operate in DB management	2,002	49.3%
No, we don't	2,062	50.7%

Only 4.5% of B&I in the Frame indicated a need for additional HR capacities or skills related to database management for at least one database. Since many businesses use multiple database technologies, when each database platform or tool used by individual B&I is treated as a separate case, the lack of capacity is observed on average in 8.9% of cases. When analyzing specific database technologies, only a small fraction of B&I (2.4% or less) report a need to enhance their capacities for any particular database management technology.

**Table 34:** Distribution of the B&I operating with database management by the used technologies

Database related technologies		Number of B&I operating with database management		B&I that need to increase capacities/ skills in database management to fulfill their objective		
		number [a] sorted	% over total	number [b]	% over total	% on valid group [a]/[b]
1.	MYSQL	1,511	37.2%	98	2.4%	6.5%
2.	Postgresql	1,002	24.7%	48	1.2%	4.8%
3.	Microsoft SQL	981	24.1%	98	2.4%	10.0%
4.	MongoDB	876	21.6%	42	1.0%	4.8%
5.	Oracle	706	17.4%	88	2.2%	12.5%
6.	Firebase	546	13.4%	39	1.0%	7.1%
7.	Graph DB	372	9.1%	56	1.4%	15.2%
8.	JDBC	361	8.9%	26	0.6%	7.1%
9.	ACCESS	304	7.5%	22	0.5%	7.2%
10.	AuroraDB	260	6.4%	38	0.9%	14.6%
11.	Apache Derby	233	5.7%	41	1.0%	17.8%
12.	SAS	233	5.7%	38	0.9%	16.5%
13.	Object Store	229	5.6%	41	1.0%	17.7%
<b>TOTAL number of B&amp;I in the Frame</b>		<b>4,065</b>	<b>100%</b>			
<b>B&amp;I that need to increase capacity for at least one database</b>				<b>182</b>	<b>4.5%</b>	
<b>Average for all database technologies (weighted)</b>						<b>8.9%</b>

## 2.1.4 Recruitment for new vacancies

Among the surveyed B&Is, 26.5% reported to have had at least one vacancy for an ICT position in the past 12 months. Vacancies are more common among B&Is in Tirana (31.6%) compared to those outside of Tirana (18.1%), and among ICT providers (37.8%) compared to ICT consumers (22.5%).

Out of the B&Is reporting past vacancies, 364 (54.7%) encountered difficulties in filling these positions. The average time reported to fill vacancies is 3.1 months. “ICT providers”, “private businesses”, and “B&I with 10-49 ICT staff” were the quickest to fill vacancies, with an average time of 2.2 months. Public B&I took the longest, averaging 5.0 months to fill their vacancies, more than twice the time required by private B&Is.

Table 35: Frequency of B&I vacancies in the last 12 months

Subgroups	B&I that had vacancies		B&I that had difficulties filling the vacancies		Average time to fill the vacancy (in months)
	number	valid %	number	% over B&I that had vacancies	
ICT providers	252	37.8%	144	57.1%	2.2
ICT consumers	414	22.5%	220	53.2%	3.7
Outside Tirana	171	18.1%	94	54.9%	3.4
Tirana	495	31.6%	270	54.6%	3.0
Private	568	25.6%	312	54.9%	2.2
Public	98	33.3%	52	53.4%	5.0
1 to 9 ICT people	377	18.5%	203	53.8%	4.0
10 to 49 "	239	58.5%	129	54.0%	2.2
50+ ICT "	50	75.1%	32	64.4%	2.3
<b>Total</b>	<b>666</b>	<b>26.5%</b>	<b>364</b>	<b>54.7%</b>	<b>3.1</b>

For over two-thirds of B&Is, filling a vacancy took two months or less, which is relatively a short period for a full recruitment process. In contrast, the process took significantly longer for Public institutions. Notably, 31.4% of Public B&I reported that it took more than six months to fill a vacancy.

Table 36: Average time to fill the vacancy by Ownership

Time	B&I share	Ownership	
		private	public
Less than one month	36.2%	38.4%	25.8%
1-2 months	32.8%	34.7%	23.6%
3-4 months	14.9%	15.6%	11.3%
5-6 months	4.5%	3.8%	7.8%
More than 6 months	11.6%	7.5%	31.4%

## A more matured ICT labor market, still with challenges of professionalism and efficiency

Comparing with the 2021 HDPC survey on ICT providers, it is noticed that the share of IT service providers reporting vacancies in the past 12 months has dropped from 63% to 38.9%. Similarly, the share of B&Is with vacancies that faced difficulties in filling them decreased from 82% to 55.4%.

As a result, the combined effect of these figures shows a notable increase in the share of B&Is that either did not have vacancies or did not face challenges in filling them, rising from 49% to 78.4%. This compelling statistic underscores another dimension of the maturation of the ICT labor market in Albania. In terms of the future, the primary challenge for the sector might shift from retaining staff or filling vacancies to enhancing professional skills and improving organizations' efficiency.

**Table 37:** Comparison 2024-2021 of IT service providers having vacancies in previous 12 months

IT services providers (NACE 62 and 63 only)...	2024		2021	
	number	%	number	%
...that had vacancies in past 12 months	218	38.9%	349	63%
...that faced difficulties to fill the vacancies (percentage over those who had vacancies)	121	55.4%	285	82%
...that did not had vacancies or did not have difficulties to fill them		78.4%		49%

*\*part of the ICT providers (NACE 61-63)*

## Social media as the main communication channel for staff recruitment

B&Is, to fill up their ICT vacancies, primarily rely on announcements on the “social media or their organization’s website” with 45.1% using this approach. In contrast, cooperation with educational and training institutions for employment purposes is rarely used, by only 3.8% of the B&Is adopting this method as their primary approach.

**Table 38:** Main method to fill the vacancy by Location and Ownership

Methods to fill the vacancies	B&I share	Location		Ownership	
		Outside Tirana	Tirana	Private	Public
Announcements in job portals	27.3%	33.0%	24.9%	24.5%	41.5%
Announcements on social media or organization's website	45.1%	31.2%	51.0%	43.5%	53.3%
From education/training institutions organization's website	3.8%	5.3%	3.1%	4.5%	0.0%
Acquaintances, relatives and friends	23.8%	30.5%	21.0%	27.5%	5.1%

“The aspiration to migrate in the future” is the most significant challenge private businesses face in filling up their vacancies, with 37.7% of private B&Is identifying it as a major obstacle. Whenever possible, businesses tend to avoid hiring candidates who have plans to migrate in the future.

Whereas “Wages not high enough to attract qualified candidates” is the most significant challenge public institutions face in filling up their vacancies, with 41.7% of public B&Is identifying it as a major obstacle.

**Table 39:** Degree of obstacles to fill the vacancies for Private and Public sector

Database related technologies	PRIVATE sector				PUBLIC sector			
	Does not exist	A small obstacle	Average obstacle	Big obstacle	Does not exist	A small obstacle	Average obstacle	Big obstacle
Insufficient supply of candidates who poses adequate professional skills	32.0%	18.8%	34.4%	14.8%	31.0%	24.6%	30.0%	14.4%
Not enough work experience for the position	22.2%	23.4%	32.2%	22.2%	14.0%	32.1%	41.7%	12.2%
Non adequate formal education	33.2%	22.4%	29.1%	15.4%	44.1%	16.9%	20.4%	18.6%
Wages not high enough to attract qualified candidates	28.6%	22.4%	35.3%	13.8%	11.2%	19.2%	28.0%	<b>41.7%</b>
Candidates do not favor staying a long time in an organization	25.0%	21.6%	28.4%	25.0%	27.8%	25.7%	40.3%	6.2%
Candidates aspire to migrate in the future	19.8%	15.0%	27.5%	<b>37.7%</b>	22.2%	21.4%	29.5%	26.9%
Internal bureaucracy	61.2%	25.1%	9.4%	4.2%	55.7%	20.3%	9.6%	14.5%

## High Staff Retention rate in the ICT sector

Over the past 12 months, approximately 2,822 ICT professionals have left B&Is in the Frame, out of these, 1,271 individuals (45.0%) for emigration purposes. Nationally, the average staff turnover rate for ICT professionals is 12.3%, while Albania’s ICT workforce experiences an emigration rate of about 5.5%.

## IT operations and support technicians, with the highest turnover rate

Among the ICT job profiles, “IT operations and support technicians” have been the most severely impacted, experiencing the highest staff turnover rate at 23.8%, combined with a concerning annual migration rate of 12.7%. This trend poses a significant threat to the sustainability of the job market, underscoring the urgent need for intervention in terms of the sectors’ occupations. “ICT managers and ICT trainers” represent the subgroup with the second-highest employee turnover rate, at a level of 18.6%.

**Table 40:** ICT employee turnover and emigration rate in the last 12 months by job profile

ICT profile of the main duty	Separated ICT professionals		Separated for emigration reasons		
	number	% in subgroup	number	% in subgroup	% to number of separated
ICT services managers and ICT trainers	348	18.6%	130	6.9%	37.3%
Professional ICT Sales	193	18.1%	113	10.6%	58.6%
Software developers: mostly Front-End	225	10.4%	122	5.6%	54.1%
Software developers: mostly Back-End	240	10.3%	103	4.4%	42.6%
Software engineers / architects	141	9.4%	85	5.7%	60.6%
Business analysts/ QA/ Testers or Scrum Masters	77	9.7%	20	2.5%	26.0%
Devops	61	7.3%	31	3.7%	50.5%
Database designers and administrators	69	7.9%	20	2.3%	29.1%
Data analyst/ scientist	44	10.4%	24	5.6%	54.1%
System engineers / administrators	189	10.8%	67	3.8%	35.2%
Cyber security specialist	68	15.7%	4	1.0%	6.4%
Network and network security engineers	77	8.2%	25	2.7%	33.1%
Electronic/ mechatronic/ telecomm. engineers	159	5.8%	52	1.9%	33.0%
IT operations/ support technicians	646	23.8%	344	12.7%	53.2%
Telecommunication and broadcasting technicians	240	11.6%	116	5.6%	48.2%
ICT assemblers and hardware repairers	42	16.6%	14	5.4%	32.5%
AI consultants and developers	2	1.1%	1	0.6%	54.0%
<b>Average for all database technologies (weighted)</b>	<b>2,822</b>	<b>12.3%</b>	<b>1,271</b>	<b>5.5%</b>	<b>45.0%</b>

Approximately 705 B&I (28.1% of those surveyed) anticipate making at least one new ICT recruitment in the next 12 months. B&Is with “10 or more employees”, as well as “ICT providers” in general, show higher shares of businesses forecasting vacancies. At the national level, the total number of predicted ICT recruitments for the coming year is estimated to be 2,505 individuals, which represents around 10.9% of the entire ICT workforce in the country.

The ICT recruitment ratio as a percentage of the total number of ICT employees is nearly identical for both ICT providers (10.8%) and the ICT consumers (11.0%). Some similar patterns are observed across different dimensions of location and ownership, suggesting that the distribution of the ICT workforce in Albania is likely to remain stable in the near future.

This reinforces the idea that Albania’s ICT job market is undergoing a dynamic transformation. While initially characterized by expansion in the workforce size, recent trends have shown a reshuffling of ICT professionals across sectors, with a noticeable shift towards the subsector of ICT providers. This development highlights the evolving structure of the ICT industry in Albania.

This does not, by any means, suggest that the sector’s growth and evolution have come to an end. Rather, it signals once again that the ICT is transitioning from an emerging sector in the Albanian economy to a matured and well-established one.

**Table 41:** Number of recruitments foreseen in the coming 12 months by Sector, Location, Ownership and Size

Subgroups	B&I that predict at least one vacancy		ICT recruitments predicted	
	number	valid %	number	% in subgroup
ICT providers	343	51.6%	1,354	10.8%
ICT consumers	362	19.6%	1,151	11.0%
Outside Tirana	169	17.9%	481	11.9%
Tirana	536	34.2%	2,024	10.7%
Private	619	27.9%	2,283	11.0%
Public	86	29.2%	222	10.0%
1 to 9 ICT people	426	20.9%	907	13.7%
10 to 49 -"	236	57.8%	1,110	13.2%
50+ ICT -"	43	64.9%	488	7.1%
<b>Total</b>	<b>705</b>	<b>28.1%</b>	<b>2,505</b>	<b>10.9%</b>

Note:: Valid percentages of B&I are calculated over the number of B&I (2512 in total) of Group A that was asked this question, thus Freelancers and similar businesses to them (Group B) are excluded as irrelevant and/or missing data

## IT operations/ support technicians, the most needed occupation in the ICT job market

The “IT operations/ support technicians” is expected to experience the highest number of vacancies over the next 12 months (510 new projected recruitments). This represents 18.8% of the current IT technician workforce and is equivalent to the accumulated vacancies for “front-end and back-end developers”, the core workforce of the sector.

“Cyber security specialists”, are expected to experience the fastest growth in employment from new recruitments, with vacancies accounting for 21.5% of their current workforce, followed by “IT technicians” (18.8%), and “network and network security engineers”(15.2%).

In aggregate, it is proved that businesses tend to hire fewer new employees than the number of vacancies they plan for in anticipation. This discrepancy arises partly because not every vacancy can be filled with the right candidate, and partly because recruitment forecasts are often based on more optimistic scenarios.

**Table 42:** ICT vacancies predicted in the next 12 months by job profile and average time to fill them

ICT profile of the main duty	Foreseen vacancies		Expected time to complete the recruitment (in months)
	number	% in subgroup	
ICT services managers and ICT trainers	132	7.1%	2.0
Professional ICT Sales	147	13.8%	2.1
Software developers: mostly Front-End	275	12.7%	2.8
Software developers: mostly Back-End	247	10.6%	2.2
Software engineers / architects	150	10.0%	2.9
Business analysts/ QA/ Testers/ Scrum masters	113	14.2%	2.5
Devops	101	12.1%	2.8
Database designers and administrators	70	8.1%	2.2
Data analyst/ scientist	32	7.5%	3.6
System engineers / administrators	154	8.8%	2.9
Cyber security specialist	93	21.5%	4.1
Network and network security engineers	141	15.2%	4.0
Electronic/mechatronic/ automation/ /telecommunication engineer	142	5.2%	4.7
IT operations/ support technicians	510	18.8%	3.6
Telecommunication & broadcasting technicians	150	7.3%	2.8
ICT assemblers and hardware repairers	35	13.7%	1.9
AI developers and consultants	13	6.3%	1.7
<b>Average for all database technologies (weighted)</b>	<b>2,505</b>	<b>10.9%</b>	<b>3.1</b>

The comparison of these findings with those of 2021 indicates significant declines in key indicators, such as employee turnover and the vacancy ratio. Employee turnover decreased from 19% in 2021 to 10.1% in 2024, while the projected vacancy ratio for the coming year dropped even further, from 32% to 10.8%.

Given that B&Is tend to actualize fewer recruitments annually than initially anticipated, and considering that emigration remains a persistent disruptor, the following table provides compelling evidence that the ICT job market appears to be stagnating in terms of aggregate numbers. Historically, the vacancy ratio in the sector has consistently exceeded employee turnover, however, this is no longer the case by the end of 2024, which serves as yet another concerning indicator.

**Table 43:** Comparison 2024-2021 of employment turnover and vacancy ratio

IT services providers (NACE 62 and 63 only)	2024	2021
ICT employee turnover	10.1%	19%
ICT vacancy ratio: $\frac{\text{foreseen ICT vacancies}}{\text{current number of ICT employees}}$	10.8%	32%

## 2.1.5 Training

### “On the job training”, the most used training across the sector

Among the B&Is in the Frame, 42.2% have established a formal training policy or strategy, 33.7% maintain a specific training structure, but only 28.0% allocate a separate budget specifically for staff training.

**Table 44:** Frequencies of B&Is having in place a policy, structure and budget dedicated to trainings

	YES	NO
Does your organization have a formal training policy or strategy?	42.2%	57.8%
Is there a training structure within your organization?	33.7%	66.3%
Do you have a separate item (fund) in your budget regarding training?	28.0%	72.0%

“On-the-job training” provided by experienced staff within the company is the most common form of training provision, utilized by 56.0% of the B&Is in the Frame (excluding freelancers). This is followed by training provided by technology suppliers, which accounts for 23.5%.

### “International certification programs” the most used training in B&Is with over 10 employees

Certification programs based on international standards and brands, such as Cisco, Microsoft, Oracle, HPE, Dell, ITIL, CompTIA, and Scrum, serve as benchmarks in the sector and are highly valued by large B&Is. Notably, 32.1% of B&Is with ICT staff of 10 or more employees engage in international certification programs as a key form of training.

**Table 45:** Frequencies of main types of training used by B&I in the Frame

Main types of training (selected more than one)	Share of B&I using it
On the job training from experienced staff of the organization	56.0%
Training from the supplier of technology including webinars	23.5%
Training provided by the company in outsourcing contract	14.0%
Training from private training Experts/Institutions in Albania	13.9%
ASPA, AKSHI (for public institutions only)	1.9%
International brands Certification programs (all B&I)	14.5%
<b>International brands Certification – ICT team with 10 or more people</b>	<b>32.1%</b>

Note: Freelancers are excluded. Some B&Is have declared more than one as “main” type of training.

“Frequent labor force mobility” is the main barrier to continuous training, cited by 25.4% of B&Is (excluding freelancers), followed by the “lack of training funds”, which was reported by 22.7% of B&Is. As a positive note, 35.0% of B&Is indicate that they face no barriers related to staff training.

**Table 46:** Frequencies of barriers that hinder the continuous training of ICT staff

Barriers that hinder training	Share of B&I
Frequent mobility of labor force	25.4%
Lack of training funds	22.7%
Lack of courses and difficulties in finding trainers with necessary capacities	16.9%
Lack of time for training	13.6%
Lack of staff motivation regarding training	7.6%
No barriers	35.0%

Note: Freelancers are excluded.

## A good satisfaction level with the quality of education institutions

Approximately 44.0% of employees with an ICT profile in Albania hold a Master degree (comprising 38.3% graduated in Albania and 5.7% graduated abroad). Meanwhile, 38.9% of the ICT employees in the Frame have a Bachelor degree (comprising 34.6% graduated in Albania and 4.3% graduated abroad), and the remaining 17.1% have an undergraduate education level (graduated only by the secondary schools).

**Table 47:** Number of ICT employees by level of education

Subgroups	number	valid %	number	% in subgroup
Secondary schools	3,430	14.9%	17.1%	17.1%
Universities in Albania - Bachelor degree	6,928	30.2%	34.6%	51.7%
Universities in Albania - Master degree	7,683	33.4%	38.3%	90.0%
Universities abroad - Bachelor degree	862	3.8%	4.3%	94.3%
Universities abroad - Master degree	1,136	4.9%	5.7%	100.0%
Employees of the B&I that did not answer	2,933	12.8%		
<b>Total</b>	<b>22,972</b>	<b>100.0%</b>	<b>100.0%</b>	

Across all levels of formal ICT education, both in Albania and abroad, the majority of managers in business and industry express either satisfaction or high satisfaction with the quality of education. Satisfaction is lowest for secondary schools in Albania, while the highest level of satisfaction is reported for Master degrees obtained from universities abroad.

**Table 48:** B&I managers' satisfaction rate from formal education

Education levels	Very dissatisfied	Dissatisfied	Neither satisfied, nor dissatisfied	Satisfied	Very satisfied
Secondary schools	13.3%	18.5%	24.5%	41.7%	12.0%
Universities in Albania - Bachelor degree	5.9%	4.9%	22.5%	53.8%	12.9%
Universities in Albania - Master degree	4.0%	3.8%	13.4%	60.6%	18.2%
Universities abroad - Bachelor degree	1.0%	0.1%	8.0%	69.1%	21.7%
Universities abroad - Master degree	0.9%	0.2%	4.9%	61.8%	32.3%

Managers of the B&Is were surveyed about their awareness on ICT training centers attended by their staff and their satisfaction with the skills acquired. Some businesses and institutions, which employ at least 15% of Albania's ICT workforce, did not respond to this question.

In total, as reported, 1,259 ICT professionals have participated in various ICT training courses offered by major training centers in Albania. SDA Albania by Protik is the most frequented center, attracting approximately 27.9% of the trainees. The Albanian ICT Academy received the highest satisfaction ratings under the lenses of the B&Is managers.

It is reasonable to assume that managers of B&Is may not be fully informed about all the professional training courses undertaken by their employees. As a result, the actual number of participants in ICT training programs is likely higher than the 1,259 recorded in the survey responses.

On average, managers of businesses and institutions expressed lower satisfaction with the quality of education provided by these professional training centers compared to the skills formation done by the universities (as described above).

**Table 49:** Number of ICT employees trained by ICT training centers

ICT training centers	Trained employees		Level of satisfaction with skills acquired				
	Number	Share	Very dissatisfied	Dissatisfied	Neither satisfied, nor dissatisfied	Satisfied	Very satisfied
SDA Albania by Protik	351	27.9%	3.3%	6.0%	40.2%	31.0%	19.5%
Albanian ICT Academy	268	21.3%	0.0%	3.1%	25.8%	27.4%	43.7%
Tirana Center of Technology	239	18.9%	1.0%	0.6%	36.8%	44.8%	16.9%
Ikub info	178	14.1%	6.8%	13.2%	26.6%	39.4%	14.0%
Communication Progress	91	7.2%	4.1%	0.8%	65.0%	13.5%	16.7%
BetaPlan Coding Bootcamps	64	5.1%	7.6%	18.4%	35.7%	14.8%	23.4%
Holberton Albania	57	4.6%	1.4%	10.1%	45.3%	40.5%	2.7%
Brainster	12	0.9%	6.4%	0.0%	68.0%	25.6%	0.0%
<b>Total</b>	<b>1,259</b>	<b>100.0%</b>					

## Important ICT developments in the HEIs and VET systems

Managers at the B&Is were asked to evaluate the significance of ongoing and planned developments in vocational and higher education institutions aimed at enhancing the skills and competencies of future graduates. A strong majority of them declare that all ongoing or planned developments in ICT vocational and higher education institutions are important or very important. The most important development is reported to be the “periodic and enhanced training of ICT teachers at all levels of the education system”, which is considered very important by approximately 45.3% of ICT employers and important by another 43.3% of them.

**Table 50:** Importance level of ongoing VET and Higher Education developments

Ongoing/ planned developments in the ICT education system	Very unimportant	Unimportant	Very dissatisfied	Neither important, nor unimportant	Important	Very important
Review and adapt curricula in order to align them with technological change and with labor market needs	4.8%	4.0%	6.7%	6.0%	46.3%	38.3%
Openness to new methodologies of teaching	2.4%	2.2%	14.0%	3.1%	47.6%	33.8%
Periodical/ augmented training of ICT teachers at all levels of education system	2.8%	0.6%	8.0%	0.6%	43.3%	45.3%
Augmenting teaching of “coding” at all levels of education	1.8%	5.6%	21.3%	13.2%	42.1%	29.3%
Focus on practical training, organization of practice, internships at companies	1.9%	2.6%	12.0%	0.8%	46.5%	37.0%
Joint projects between organization and education institutions	4.3%	6.8%	13.6%	18.4%	44.0%	31.3%
Provide career guidance services to future graduates	2.2%	5.8%	20.1%	10.1%	46.8%	25.1%
Synchronize the training programs with international standards in order to improve the supply of ICT and other professionals	2.4%	4.3%	11.9%	0.0%	46.1%	35.3%

Managers from various B&Is were asked to identify occupations they believe require enhanced or improved education to meet future market demands effectively in terms of formation and skills. Each occupation cited by a B&I was treated as a separate case, with specific recommendations for areas needing improvement.

In total, 2,286 cases were reported by B&Is managers. Out of these, job profiles within the “software industry” were the most frequently mentioned, accounting for 838 cases (36.7%), followed closely by “system and network administrators”, with 821 cases, representing 35.9% of the total.

The most commonly proposed strategy for strengthening the sector, cited in approximately 1,572 cases, was “updating the curricula in vocational schools and at the universities”. “Increasing the number of students” was suggested in 1,060 cases, while “creating new branches in vocational schools and universities” was recommended in 746 cases.

**Table 51:** Occupations for which B&I would like education to be improved/strengthened

ICT profile main groups	Cases when strengthening is suggested		Cases of specific strengthening suggested		
	Number	%	New branches	New curricula	Increase number of students
Software or database developer/ analyst/ administrator	838	36.7%	279	602	406
System or network engineer / administrator	821	35.9%	245	555	440
ICT technicians	493	21.6%	165	340	142
ICT project management	51	2.2%	25	34	40
Electronic / mechatronic / telecommunication engineer	47	2.1%	11	30	19
ICT sales professional	36	1.6%	21	8	12
<b>Total</b>	<b>666</b>	<b>26.5%</b>	<b>364</b>	<b>54.7%</b>	<b>3.1</b>

Note: : Freelancers are excluded.

The “IT services technician” is the most frequently cited occupation requiring improvement in the education system. Suggestions for enhancing the education system related to ICT technicians were made in 349 cases, accounting for 15.3% of the total cases. Out of these, 249 cases highlighted the introduction of “new curricula” as the best direction for improvement.

**Table 52:** Occupations for which B&Is would like education to be improved/strengthened

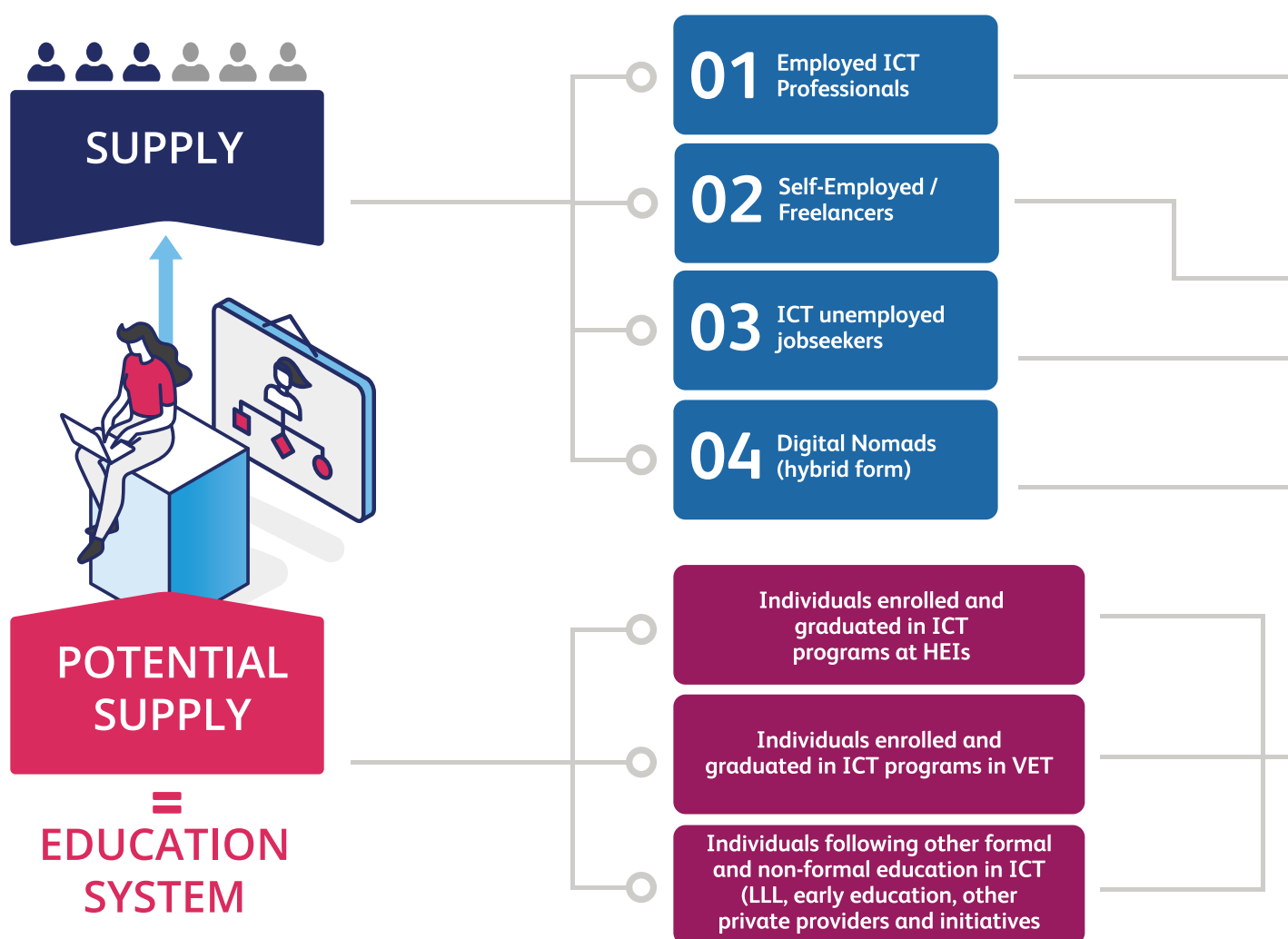
ICT profile of the main duty	Cases of strengthening suggested		Cases of specific strengthening suggested		
	Number	%	New branches	New curricula	Increase number of students
IT services technician	349	15.3%	104	249	103
Software developer	285	12.5%	51	192	95
Computer engineering	208	9.1%	77	152	102
Network and network security engineer	189	8.3%	30	134	80
Data Analyst/ Scientist	160	7.0%	57	126	106
Cybersecurity engineer	146	6.4%	98	110	94
Electronic/ Mechatronic engineer	123	5.4%	9	58	77
ICT assembler and hardware repairer	98	4.3%	35	68	32
SysAdmin	93	4.1%	19	67	54
AI/ML engineer	88	3.8%	62	76	47
Software engineer/ architect	67	2.9%	35	59	19
ICT Project Management	47	2.1%	23	30	38
Database administrator	46	2.0%	7	26	20
Telecommunication & broadcasting technicians	46	2.0%	26	23	6
IT support and helpdesk	45	2.0%	4	17	30
Business analyst	44	1.9%	32	33	30
Telecommunication engineer	41	1.8%	8	28	18
Back-end developer	29	1.3%	3	10	25
Devops	25	1.1%	12	22	8
Digital Marketing	22	1.0%	13		9
Front-end developer	19	0.8%		13	13
Data engineer/ developer/ analyst	19	0.8%	8	8	16
Web designer	18	0.8%	2	15	4
Cloud solution engineer	15	0.7%	8	15	4
Other 16 job profiles	65	2.8%	24	38	30
<b>Total</b>	<b>2,286</b>	<b>100.0%</b>	<b>746</b>	<b>1,571</b>	<b>1060</b>

Note: : Freelancers are excluded.

## 2.2 ICT LM supply – Main findings

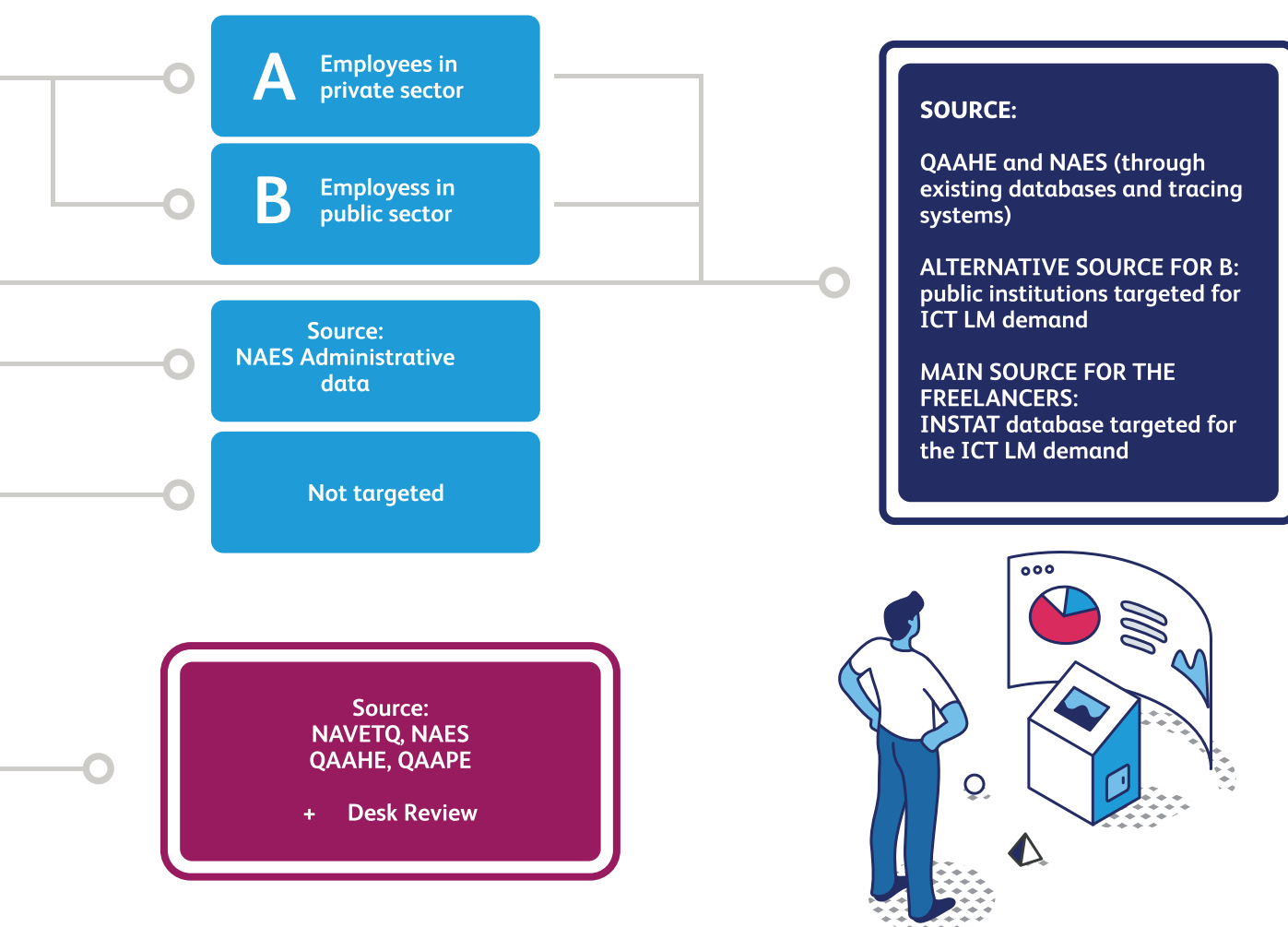
The aggregate supply in the ICT job market consists in: (1) Individuals enrolled in formal and non-formal ICT education in VET and HE and (2) Active ICT professionals employed (in private/public sector), self-employed / freelancers, unemployed (jobseekers) and digital nomads (hybrid form between self-employed and employed, in all cases based on mobility).

Figure 7: The composition of ICT labor market supply



The data regarding education system are collected by using administrative sources, while due to the challenges in directly reaching active ICT professionals involved in the ICT job market, owing to a lack of communication platforms, the following information channels were used to reach the active ICT professionals:

- Databases of graduates (alumni) from universities (HEIs), available at QAAHE (in communication with Career Guidance Offices for accreditation purposes), and databases of graduates from VET schools available at NAES. The target group consisted of graduates with a Bachelor degree from 2020-2023, as nearly all ICT graduates are employed regardless of whether they pursue a Master degree. Graduates from 2024 were excluded due to their limited work experience.
- INSTAT database of self-employed ICT professionals/freelancers
- Database of ICT employees in public institutions.



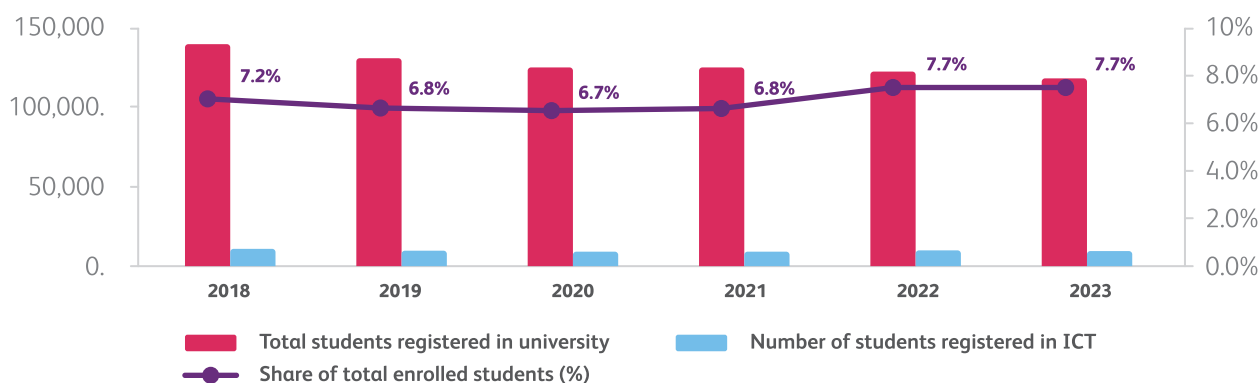
## 2.2.1 ICT LM Supply from Education

### University education

A total of 27 universities in Albania (10 public and 17 private) offer 137 study programs in ICT, comprising 76 bachelor and 61 master's degree programs, both in pure and combined ICT curricula. Nearly all universities offer both ICT bachelor's and master's study programs. However, the variety of these programs is quite similar across institutions, with little differentiation between them.

Higher Education Institutions (HEIs) have made efforts to enhance digital skills and innovation by providing both combined/interdisciplinary and updated/new programs that align with current demands. Despite these efforts, ICT enrollment accounts for an average of 7% of total university enrollments. While the total number of ICT students has increased over the years, it still remains lower compared to the number of students attending other study programs at universities.

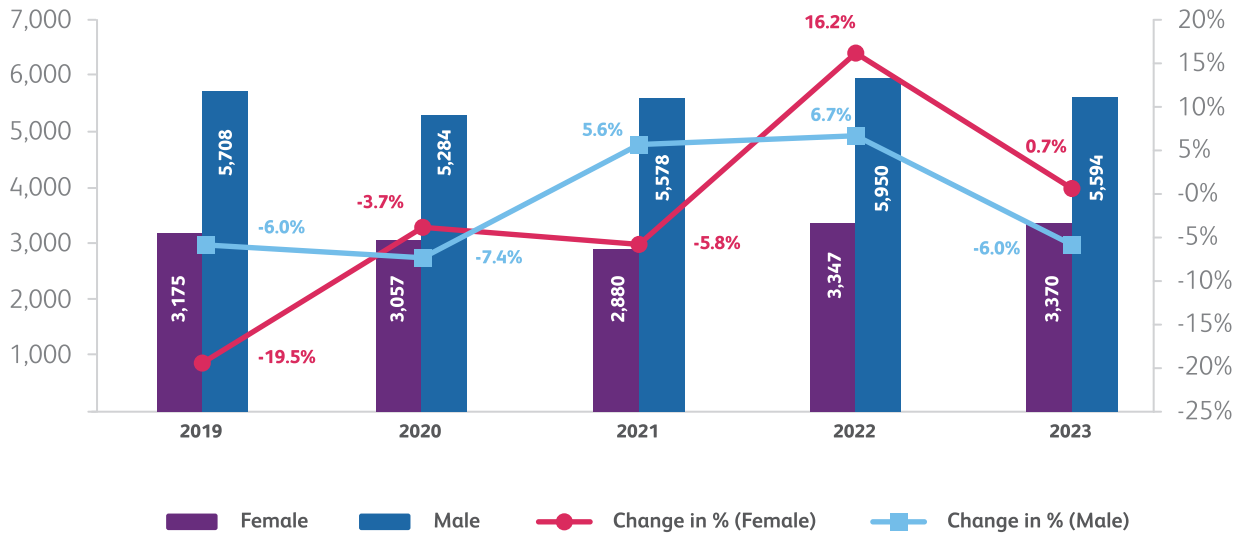
Figure 8: Number of ICT registered students



Source: INSTAT, 2024

Over the years, the majority of registered ICT students have been male, with approximately 62.4% male and 37.6% female students, according to 2023 data. However, the number of female students enrolled in ICT has been steadily increasing, reaching its highest growth in 2022, with a 16.2% rise in female enrollment compared to 2021. This positive trend continued in 2023. Despite the overall higher enrollment of female students in higher education (around 60% of total university enrollments in 2023<sup>42</sup>), the proportion of women pursuing ICT degrees remains relatively low, accounting for only 37.6% of total ICT students enrolled in 2023.

Figure 9: Number of ICT registered students at university according to gender



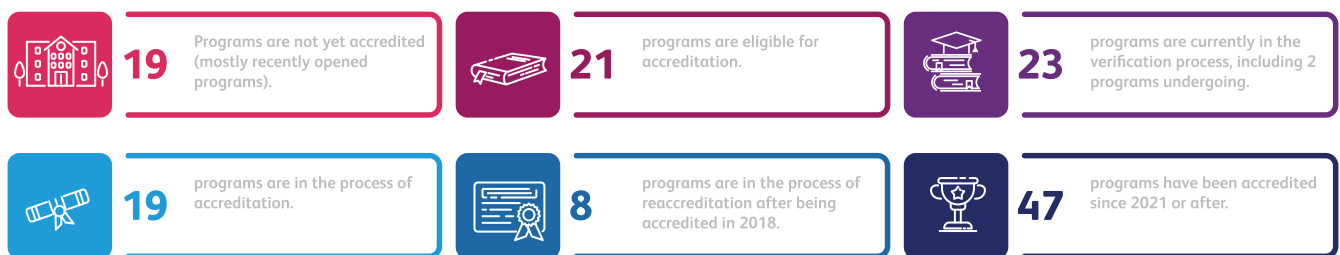
Source: INSTAT, 2024

**Emigration:** Many young people leave for Western countries, interrupting their education in Albania and leading to a decrease in the number of graduates.

**High Demand for ICT Workers:** The strong demand for ICT professionals prompts many companies to hire young people before they complete their studies. These companies provide on-the-job training tailored to specific roles, which often leads students to delay their graduation as they prioritize work experience over completing their degrees.

### Number of accredited institutions

The quality of education institutions is not rated in Albania. However, the quality assurance is assessed through the accreditation process of the education programs. By the end of 2024, the situation regarding the accreditation status of ICT study programs (both bachelor and master degrees) offered at higher education institutions (HEIs) is as follows:



## Tuition fees

Tuition fees for ICT study programs are determined by the HEIs themselves, and they generally vary depending on the degree level, program, and institution. There is a significant difference in tuition fees between public and private HEIs, with private institutions charging up to 10 times more than their public counterparts.

- Bachelor's degree tuition fees in public universities typically range from 200 to 350 EUR per academic year:
  - Tirana University - 350 EUR.
  - Polytechnic University of Tirana - 300 EUR.
  - UAMD - 250 EUR.
  - Other public universities generally - 200 EUR.
- Bachelor's degree tuition fees in private HEIs range from 1,500 to 3,900 euros per academic year:
  - University of New York Tirana apply the highest fee, followed by Epoka University, CIT, Polis, and Western Balkans University.
  - The Albanian University offers the lowest fee at 1,500 EUR.

For Master's degree ICT programs, the tuition fees are higher than for Bachelor's degrees:

- Polytechnic University of Tirana - 2,000 EUR per year.
- Agriculture University of Tirana and Luigj Gurakuqi University of Shkoder - 680 EUR and 600 EUR, respectively.
- Private HEIs: UNYT - 3,250 EUR, followed by POLIS and CIT.

Few universities provide scholarships or preferential tariffs to their students.

## Students' enrollment in ICT education programs in HEIs

A total of 19,884 students have enrolled in Bachelors ICT programs over the past five years. Starting from the 2019-2020 academic year, there has been a consistent increase in enrollment. The highest growth rates occurred during the 2021-2022 and 2022-2023 academic years, with an increase of 11% and 12%, respectively.

In terms of Master's degree programs, 5,224 students have been enrolled in ICT studies since the 2019-2020 academic year. The most significant increase in enrollment for Master's ICT programs was observed in the 2022-2023 academic year, with a growth rate of 23%.

The percentages of bachelor graduated students that follow the master studies differs a lot among the universities. A general pattern is that the top four universities in terms of the number of the ICT bachelor entries have in average smaller share of bachelor graduated that continue master studies.

**Table 53: Students enrollment and graduation in ICT by HEI and study degree**

Number of students 2020-2024 (end of academic year)					
University	Bachelor entry	Bachelor degree	Master entry	Master degree	Master entry to Bachelor degree ratio
Tirana University	3,443	3,182	1,410	1,151	44.3%
University Aleksander Xhuvani, Elbasan	2,584	634	208	61	32.8%
Epoka University	1,771	1,028	148	112	14.4%
Agriculture University of Tirana	1,489	342	44	-	12.9%
Polytechnic University of Tirana	1,330	1,034	736	522	71.2%
University Ismail Qemali, Vlore	1,208	250	230	81	92.0%
University Luarasi	1,113	343	286	177	83.4%
University Aleksander Moisiu, Durres	1,112	783	227	216	29.0%
Mediterranean University of Albania	1,085	566	279	76	49.3%
Canadian Institute of Technology	831	479	318	270	66.4%
European University of Tirana	750	700	645	577	92.1%
Metropolitan University of Tirana	546	266	80	60	30.1%
University New York Tirana	429	195	41	50	21.0%
Albanian University	357	230	115	111	50.0%
Polis University	324	180	36	16	20.0%
University College Beder	307	85	31	14	36.5%
University Fan Noli, Korçe	301	207	112	90	54.1%
University Luigj Gurakuqi, Shkoder	239	164	86	92	52.4%
University Barleti	231	102	28	NA	27.5%
University College of Business	134	57	45	12	78.9%
University Eqrem Çabej, Gjirokaster	88	86	62	38	72.1%
University College Logos	73	68	NA	NA	
Armed Forces Academy	43	NA	57	49	
Tirana Business University College	37	NA	NA	NA	
University College Qirjazi	26	NA	NA	NA	
Western Balkans University	18	NA	NA	NA	
University College Reald	15	0	NA	NA	
<b>Total</b>	<b>19,884</b>	<b>10,981</b>	<b>5,224</b>	<b>3,775</b>	<b>47.6%</b>

Source: QAAHE (2025)

“Computer science and economics” is the bachelor study program with the largest number of entry students (5,811) during the academic years ending in the 5-years period 2020-2024, while “Computer engineering/ Computer science” is the master study program with the largest number of students registered.

**Table 54:** Students enrollment and graduation in ICT by study programs and study degree

Number of students 2020-2024 (end of academic year)				
University	Bachelor entry	Bachelor degree	Master entry	Master degree
Computer science and economics	5,811	2,790	1,192	771
Computer engineering/ Computer science	4,419	2,629	2,064	1,447
Information Technology	4,191	1,838	609	374
Applied computer science	1,952	1,558	369	353
Software Engineering	1,242	456	114	97
Mathematics – Information technology	837	892	215	188
Telecommunication engineering	564	413	363	302
Cybersecurity	482	149	130	124
Geo-informatics engineering	207	159	73	69
Multimedia and TV	101	97		
ICT specialized for defense systems	43	-		
Data Science and/or AI	28	-	45	-
Robotics and mechatronics engineering	7	-		
ICT teacher			50	50
<b>Total</b>	<b>19,884</b>	<b>10,981</b>	<b>5,224</b>	<b>3,775</b>

Source: QAAHE (2025)

The number of graduates in ICT programs is noticeably lower than the number of enrolled students, with a gap ranging from 34% to 42% at the bachelor’s level and 15% to 26% at the master’s level. Overall, only one in four students who begin a bachelor’s degree in an ICT-related field go on to earn both a bachelor’s and a master’s degree.”

**Table 55:** Share of the ICT profile students that graduated from those who started the studies

Academic Years	Share of the ICT profile students that graduated from those who started the studies	
	Bachelor studies	Master studies
2021-2022	58%	80%
2022-2023	64%	85%
2023-2024	66%	74%

Source: QAAHE (2025)

## ICT graduates by year of graduation

Out of the total number of students enrolled in Bachelor’s ICT programs, 10,981 have graduated since 2020, resulting in an overall success rate of 55.2% for completing Bachelor’s studies. By the end of the 2023-2024 academic year, the number of ICT professionals graduating with a Bachelor’s degree has increased by 15%, much higher than the previous years’ average growth rate of 5%.

For Master's degree students, 3,775 students have successfully graduated by the end of the 2023-2024 academic year, reflecting a success rate of 72.2%. The highest peak in success rate was reached in the 2021-2022 academic year, with a 16% increase.

A considerable variation in success rates for completing Bachelor's studies is observed across universities. The highest success rate for the entire period was recorded at Epoka University with 97.7%, followed by Agriculture University of Tirana at 93.3%, and Mediterranean University of Tirana at 92.4%.

Over the past five years, 29% of Bachelor's degree graduates in ICT came from Tirana University, followed by Polytechnic University of Tirana and Epoka University, each contributing 9.4% of the total graduates. Other notable contributors include Aleksander Moisiu University of Durres with 7.12%, and European University of Tirana with 6.4%.

For Master's degree graduates, Tirana University leads, with 30.5% of graduates, followed by European University of Tirana at 15.3%, Polytechnic University of Tirana at 13.8%, and Canadian Institute of Technology at 7.2%.

## ICT graduate employment rate

Based on information from the Alumni databases and their linkages to the labor market, the Higher Education Institutions (HEIs) that provide such data report a high employment rate for their ICT graduates and professionals. The employment rate varies depending on the study program and the field of employment, with the overall employment rate ranging from 60% to 100%. On average, 90% of ICT graduates are employed in their field of study.

Other forms of employment are much less common. Part-time employment, unemployment, and employment in fields unrelated to their studies each have rates of around 10% or lower. Self-employment also represents a small proportion of the overall employment landscape for ICT graduates.

## VET education

VET schools play a significant role in ICT education in Albania. These schools allow individuals to earn level II, III, or IV qualifications within the Albanian Qualification Framework (AFQ), which enables them to advance from skilled workers to secondary technicians in their chosen field.

To further develop the ICT sector, National Agency for VET and Qualifications (NAVETQ) established the Sectorial Skills Committee (SSC) of ICT in 2021, focusing on "Computer Programming & Information Services." This committee holds regular meetings to discuss necessary developments in the ICT sector, curriculum design, and the assessment of market needs<sup>43</sup>.

<sup>43</sup> See more in: <https://www.akafp.gov.al/ks-tik/>

In recent years, there has been an increased interest from students in pursuing vocational education within the ICT field. Several vocational schools offer ICT programs, but only one—Herman Gmeiner in Tirana<sup>44</sup> – is fully specialized in ICT education.

VET schools are playing an important role into the ICT education. Vocational secondary education allows individuals to earn level II, III, or IV qualifications within the Albanian Qualification Framework, advancing from a skilled worker to a secondary technician in their chosen field of study. To develop the ICT sector, the NAVETQ set up for the first time in 2021 the SSC of ICT, focused on “Computer Programming & Information Services. This committee holds regular meetings regarding discussions necessary for the development of the ICT sector, the development of curricula and the assessment of market needs.

In general, the ICT profile offered by the school has a 2+2 structure. Successful completion of the ICT professional qualification, level II of AFQ, equips the student with the certificate of a semi-qualified employee (assistant), with the right to continue education at level IV of AFQ professional qualification (one year), in one of the educational profiles of this direction: 1. Data networks; 2. ICT user support; 3. Website development; and 4. Data networks - GIZ pilot.

In addition to the vocational schools, there are 10 vocational centers across various cities in Albania. Public VET centers in the country offer a range of 100 short-term vocational training courses, including specialized Digital Skills courses. Below is a list of the ICT profiles provided by these vocational training centers:

**Table 56:** List of vocational training centers that provide ICT profile

University	University
Korça	Graphic design, Computers, digital skills, web design
Gjirokastra	Digital skills
Vlora	Web design, Digital Marketing, Digital Skills
Fier	Digital skills
Durres	Graphic design, digital skills
Shkodra	Graphic design, computer network technician, digital skills
Elbasan	Graphic design, Computer service, digital skills.
Mobile center for the Northeast region	Graphic design
Tirana (VTC 1)	Graphic design, web design, computer network technician, computer services, digital skills
Tirana (VTC 4)	Graphic design, computer services, web design, digital skills

Source: NAES (2024)

Approximately 400 pupils graduate each year from the public VET system in Albania, and these graduates report a high satisfaction level regarding their employability. The vocational training received, particularly in ICT-related profiles, effectively prepares them for the workforce, contributing to a strong connection between the education system and labor market demands. This outcome underscores the growing relevance of vocational education in meeting the needs of the ICT sector in Albania.

<sup>44</sup> <https://aftesi.puna.gov.al/drejtme/9>

## Graduate employability rate in VET ICT.

For 2022 graduates, tracking results indicate that:

- 43% are already employed,
- 41% are continuing their university studies,
- 13% are unemployed,
- 3% are inactive in the labor market.

For 2023 graduates, the employment situation is notably more positive, as seen in the table below. Particularly, the “Software Informatics Engineering” profile demonstrates a significantly higher employability rate, highlighting the strong demand for specialized skills in this area within the ICT sector.

The trends indicate growing success in the transition from education to employment for vocational and technical graduates, especially those with expertise in high-demand fields like software engineering.

**Table 57:** Data from NAES tracing system on ICT

ICT graduates	Total	Software Informatics Engineering	ICT
Pupils in ICT grade XIII for 2023-2024	446	70	376
<b>Employability rate for graduates 2023</b>			
		Software Informatics Engineering	ICT
Employed		84%	61%
Pursuing further / university studies		16%	27%
NEET		0%	13%

Source: NAES (2024)

## Enrollment in ICT education programs.

According to NAVETQ data, a total of 15 schools across Albania offer ICT-related profiles at qualification levels AQF II and IV. All but the Hermann Gmeiner School in Tirana focus on pure ICT profiles. Other ICT-related profiles provided by these schools include:

- Data Networks
- Programming
- Website Development
- ICT User Support
- Multimedia
- Software Informatics Engineering

Over the past five years, the number of students enrolled in ICT-related profiles across these schools has steadily increased, with an impressive growth rate of almost 30%. The most notable growth occurred in the last two academic years, with an increase from 2,270 ICT pupils in the 2023-2024 academic year to 2,591 ICT pupils in 2024-2025.

The schools in Tirana–Gjergji Canco, Hermann Gmeiner, and Professional Schools Kamez–enroll the largest number of ICT students. In contrast, schools in Kukës and Shkoder register around 50 students per year. Positive efforts have been made in Berat and Gjirokaštër to boost ICT student enrollment, with the number of students rising from 0 and 4 in 2020-2021 to 47 and 45, respectively, in 2024-2025.

Table 58: Academic offer and enrollment in ICT by year and school

Academic offer by year								
No.	School	Title of qualification	2020-2021 No.of pupils	2021-2022 No.of pupils	2022-2023 No.of pupils	2023-2024 No.of pupils	2024-2025 No.of pupils	Total
1	Arben Broci Shkodër	Information and Communication Technology (ICT)	26	26	23	26	26	47
		Data networks	20	17	8	0	0	
		Programming	0	0	11	20	21	
2	Beqir Çela Durrës	Information and Communication Technology (ICT)	26	26	23	26	26	213
		ICT users support	20	17	8	0	0	
		Website Development	0	0	11	20	21	
3	Teknike Korçë	Information and Communication Technology (ICT)	82	62	25	75	85	141
		Programming	0	0	16	13	9	
		ICT users support	62	58	35	22	12	
		Multimedia	0	0	0	0	21	
		Website Development	0	0	0	0	14	
		Data networks	41	40	16	10	0	
4	Gjergji Canco Tiranë	Information and Communication Technology (ICT)	201	250	308	328	334	618
		Multimedia	0	32	64	65	65	
		Multimedia (Dual)	0	0	0	0	18	
		Programming	0	35	73	70	69	
		Website Development	60	29	0	0	39	
		ICT users support	25	0	0	23	23	
		Data networks	60	34	32	60	70	
5	Hasan Gina Lushnje	Information and Communication Technology (ICT)	39	33	34	42	35	60
		Data networks	22	32	17	0	0	
		ICT users support	0	0	16	20	25	
6	Hermann Gmeiner Tiranë	Software Informatics Engineering	287	328	319	297	297	297
7	Kolin Gjoka Lezhë	Information and Communication Technology (ICT)	60	67	73	92	96	157
		Data networks	0	12	0	0	0	
		Multimedia	0	0	13	31	61	
		Website Development	75	51	30	10	0	
8	Nazmi Rushiti Peshkopi	Information and Communication Technology (ICT)	27	30	35	27	40	59
		Multimedia	0	0	0	5	15	
		Data networks	0	8	4	0	0	
		Website Development	17	14	0	0	0	
		ICT users support	29	0	0	0	0	
		Programming	0	0	13	4	4	
9	Pavarësia Vlorë	Information and Communication Technology (ICT)	79	84	70	72	81	144
		Website Development	79	72	0	19	18	
		Multimedia	0	0	19	33	45	
		Programming	0	0	40	17	0	
10	Petro Sota Fier	Information and Communication Technology (ICT)	59	68	66	60	90	133
		Website Development	44	49	47	38	43	
11	Profesionale Kamëz	Information and Communication Technology (ICT)	0	0	120	92	184	290
		Information and Communication Technology (ICT) (Pilot GIZ)	138	121	0	66	0	
		Data networks (Pilot GIZ)	126	119	111	102	106	
12	Profesionale Elbasan	Information and Communication Technology (ICT)	70	93	126	150	181	285
		Multimedia	0	0	0	0	13	
		Programming	0	16	15	24	46	
		ICT users support	48	45	43	47	45	
13	Stiliano Bandilli Berat	Information and Communication Technology (ICT)	0	15	27	25	30	47
		ICT users support	0	0	0	7	17	
14	Thoma Papano Gjirokaštër	Information and Communication Technology (ICT)	0	14	24	22	28	45
		ICT users support	4	0	0	7	17	
15	Havzi Nela Kukës	Information and Communication Technology (ICT)	31	29	30	28	29	55
		ICT users support	27	26	20	24	26	
Total of pupils			1,995	2,129	2,122	2,270	2,591	

## 2.3 Active ICT professionals main findings

Employee perceptions were gathered through a short questionnaire containing direct questions on employees' and freelancers' satisfaction levels with current and future ICT market developments, including financial terms. Specific questions were also included to measure satisfaction with the education system and training centers.

The survey sample included 646 active ICT professionals in the labor market. According to the methodology, the minimum target for valid responses was set at 200 respondents from the private sector and 200 respondents from the public sector. Both targets were met.

The gender distribution of the respondents was random, with an average of 33.1% female and 66.9% male. There was a slightly higher proportion of female ICT professionals in the public sector.

**Table 59:** Sample composition by sector and gender

Type of employer	ICT professionals	Female	Male
<b>Private sector</b>	<b>259</b>	<b>32.0%</b>	<b>68.0%</b>
<i>Freelancer</i>	14	28.6%	71.4%
<i>Private businesses</i>	245	32.2%	67.8%
<b>Public sector</b>	<b>387</b>	<b>33.9%</b>	<b>66.1%</b>
<b>Total</b>	<b>646</b>	<b>33.1%</b>	<b>66.9%</b>

The distribution of “years of experience” among ICT employees in the sample is influenced by the younger age of alumni who graduated recently (within the last five years or less). However, it is evident that 30.7% of the respondents have less than three years of experience, while 20.7% have more than ten years of experience.

The share of female employees has consistently grown over time, with the youngest subgroup now accounting for 48.5% of all female employees. This positive trend can largely be attributed to the evolving dynamics of the ICT job market. The software industry, which has the highest concentration of female professionals, has experienced significant growth in recent years, establishing itself as the leading subsector within the ICT field. Among junior ICT professionals, the gender gap is noticeably closing.

**Table 60:** Sample composition by experience and gender

Years of work experience in the sector	ICT professionals		Gender composition	
	number	share	female	male
< 3 years	198	30.7%	48.5%	51.5%
3-5 years	161	24.9%	31.7%	68.3%
6-10 years	153	23.7%	25.5%	74.5%
> 10 years	134	20.7%	20.9%	79.1%
<b>Total</b>	<b>646</b>	<b>100.0%</b>	<b>33.1%</b>	<b>66.9%</b>

## High level of satisfaction with the education system

An overwhelming majority of ICT employees report being satisfied or very satisfied with all levels of education. The highest satisfaction is associated with the competencies gained through Master’s degrees from universities, whether in Albania or abroad. Notably, one-third (33%) of Master’s graduates from Albanian universities expressed high satisfaction with the skills and competencies acquired, compared to those with Bachelor’s degrees. This level of satisfaction is also mirrored by all Master’s graduates from abroad who participated in the survey.

It’s noteworthy that employee satisfaction regarding formal education exceeds employer satisfaction, highlighting a potential disconnect between the two perspectives.

**Table 61:** Employees’ satisfaction level for competences acquired during formal education

Level and place of education	Answers	Level of satisfaction with competences and skills acquired				
		very dissatisfied	dissatisfied	neither satisfied, nor dissatisfied	satisfied	very satisfied
Secondary school	645	4.3%	7.6%	15.2%	46.0%	26.8%
Universities in Albania - Bachelor degree	605	4.3%	8.4%	18.8%	46.1%	22.3%
Universities in Albania - Master degree	379	2.4%	4.7%	13.5%	46.4%	33.0%
Universities abroad - Bachelor degree	15				26.7%	73.3%
Universities abroad - Master degree	19					100.0%

“Autodidactic online training” and “certification programs” are the most popular among active ICT professionals, with these platforms receiving some of the highest satisfaction ratings. Nearly all employees who utilized such platforms report being either satisfied or very satisfied.

At least 17 ICT training centers are currently used by the employees in the sample. The majority of those who attended these centers expressed satisfaction or high satisfaction with their experiences. SDA Albania by Protik is the most frequently used training center. However, employees trained there report slightly lower satisfaction levels, with 18.1% expressing dissatisfaction or very dissatisfaction, compared to other centers.

On the other hand, the School of Informatics (and Cisco Networking Academy) received the highest satisfaction ratings, with 76.9% of trained employees being very satisfied with the competencies gained. Interestingly, the School of Informatics also emerged as a popular choice in the “Others” category of the employee questionnaire, though it wasn’t listed in the employer survey options. This suggests that the actual frequency of employees using this center should be higher.

**Table 62:** Employees’ satisfaction level for competences acquired from professional training centers

ICT training centres	Answers	Level of satisfaction with competences and skills acquired				
		very dissatisfied	dissatisfied	neither satisfied, nor dissatisfied	satisfied	very satisfied
Online training and certification, Udemy, Coursera, etc.	39			2.6%	35.9%	61.5%
SDA Albania by Protik	22	4.5%	13.6%	18.2%	27.3%	36.4%
Tirana Center of Technology	17				52.9%	47.1%
Albanian ICT Academy	15			6.7%	33.3%	60.0%
School of Informatics, Cisco Networking Academy	13				23.1%	76.9%
Ikub info	12		8.3%	16.7%	33.3%	41.7%
Communication Progress	5			40.0%	20.0%	40.0%
BetaPlan Coding Bootcamps	5				40.0%	60.0%
Others (Holberton, Brainster, Cactus, Dominosoft, Harry Fultz, Hardsoft, EC Council, IER Academy, Investo Digital, Codecademy)	20	5.0%	5.0%	15.0%	10.0%	65.0%

## Job satisfaction scores

Around two-thirds of respondents report being satisfied or very satisfied with their current roles (67.8%) and their working conditions and workload (66.8%). Fewer than 10% express dissatisfaction with these aspects (6.5% and 9.5%, respectively).

However, satisfaction drops when it comes to financial terms and salaries. 27.6% of respondents are dissatisfied or very dissatisfied, 32.0% are neutral, and only 40.4% are satisfied or very satisfied with their current salaries in relation to expectations.

**Table 63:** Employees’ satisfaction level with their job/ working environment

Different aspects of the working environment	Answers	Level of satisfaction with competences and skills acquired				
		very dissatisfied/ concerned	dissatisfied/ concerned	neither satisfied, nor dissatisfied / concerned	satisfied / secure	very satisfied / secure
Satisfaction level with current role in your organization	646	2.3%	4.2%	25.7%	45.5%	22.3%
Satisfaction level with general working conditions including the load of works in the organization	646	2.8%	6.7%	23.8%	45.4%	21.4%
Satisfaction level with current salary compared to expectations and information about the job market	646	7.9%	19.7%	32.0%	31.7%	8.7%
Level of concern with the forecast of the future job market for your job profiles	646	3.9%	8.2%	35.0%	39.3%	13.6%

## Salary growth rates.

The survey results confirm that the ICT sector is experiencing upward pressure on salaries. 74.3% of respondents reported a salary increase in the past 12 months, while only 1.4% reported a decrease. These trends are consistent across gender and sector subgroups.

**Table 64:** Trend of ICT employees' salary in the last 12 months

Salary trend	Employees	Share
Increased	480	74.3%
Unchanged	157	24.3%
Decreased	9	1.4%
<b>Total</b>	<b>646</b>	<b>100.0%</b>

## Optimistic market projection for the next 5 years

ICT professionals were asked about their career projections for the next five years. 17.0% of respondents reported not having a clear outlook on their future in the sector's labor market. Among those with a defined plan, nearly half (49.1%) intend to continue working in Albania in their current role. About one-quarter (25.8%) aspire to shift to entrepreneurial or freelance work, while the remaining 24.1% plan to emigrate and pursue ICT opportunities abroad.

**Table 65:** Projection of ICT employees' careers over the next five years

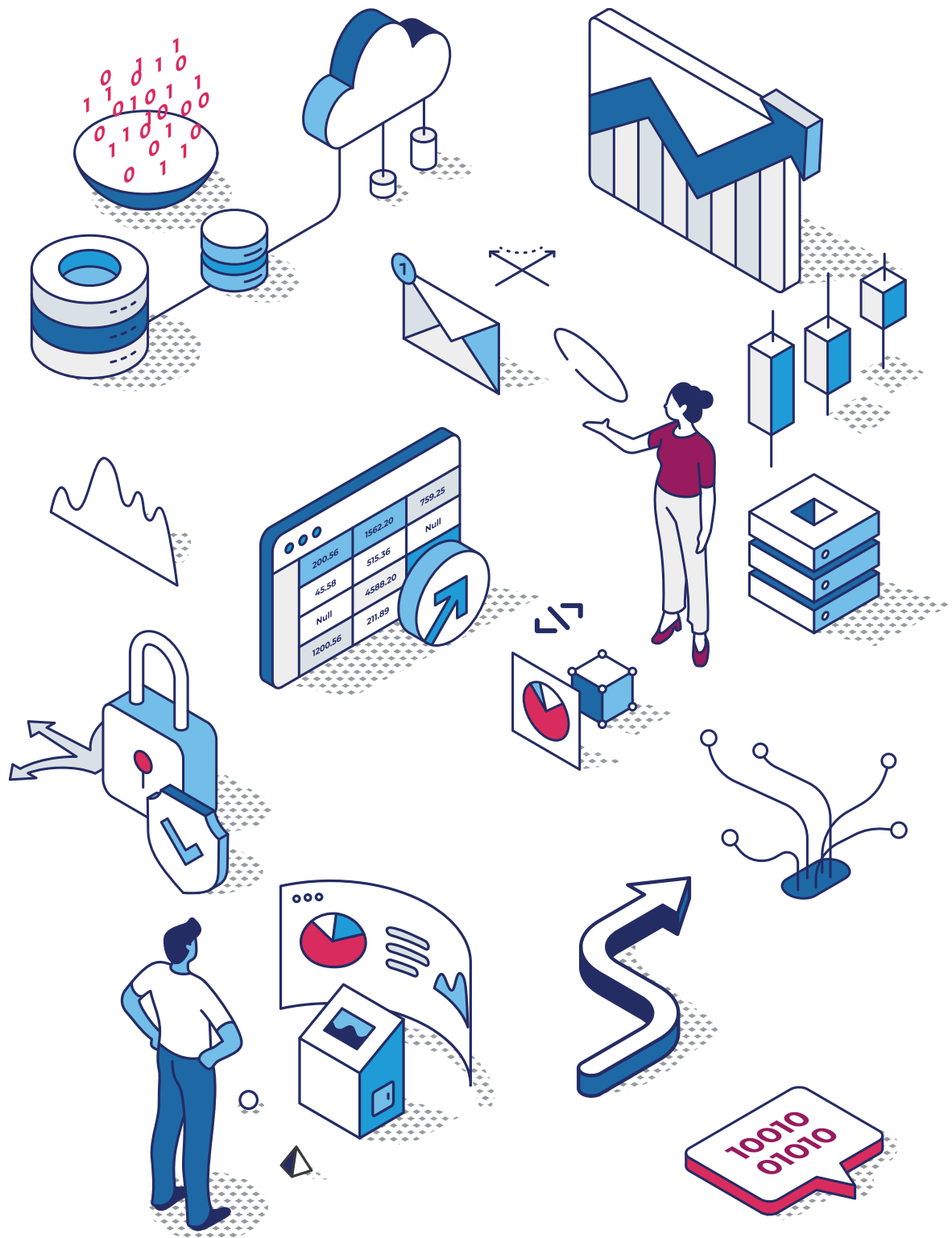
Status projection in next 5 years	Employees	Share	Valid %
Employee in Albania	263	40.7%	49.1%
Working as professional abroad	129	20.0%	24.1%
Entrepreneur in Albania	84	13.0%	15.7%
Freelancer in Albania	54	8.4%	10.1%
Non-ICT professional career	6	0.9%	1.1%
Don't know	110	17.0%	
<b>Grand Total</b>	<b>646</b>	<b>100.0%</b>	

## Registered ICT unemployed jobseekers ICT jobseekers number

ICT professionals were asked about their career projections for the next five years. 17.0% of respondents reported not having a clear outlook on their future in the sector's labor market. Among those with a defined plan, nearly half (49.1%) intend to continue working in Albania in their current role. About one-quarter (25.8%) aspire to shift to entrepreneurial or freelance work, while the remaining 24.1% plan to emigrate and pursue ICT opportunities abroad.

**Table 66:** NAES administrative data

Administrative data	Total	ICT specialists	ICT technicians
ICT unemployed jobseekers	696	319	377
ICT jobseekers	1,328	981	347



# 3. CONCLUSIONS AND RECOMMENDATIONS

## ICT Labor Demand

	According to the ToRs	Results
Facts and Figures:	The most significant actors interested in hiring ICT professionals	<p>90.3% of employees in private sector; 9.7% of employees in public sector.</p> <p>Women in ICT workforce 32.1%.</p> <p>Sectorial distribution: “Information Communication and Technology ICT” - 2,219 businesses (12,501 employees, 54.6% of total employees); “Professional services” – 10.4% of total employees; “Public sector, health, education, art, social activities” – 10.2% of the total ICT workforce.</p> <p>The highest density of ICT professional is in “Financial and Insurance activities” (16.3%). The 2nd highest is in “Media, broadcasting and publishing” (8.4%).</p> <p>51.1% of ICT providers involved in export (38.8% of their workforce).</p>
	Location	<p>82.4% of ICT employment in Tirana; 17.6% of ICT employment outside Tirana.</p>
	Firm size	<p>B&amp;I with 1-9 ICT employees represent 62.4% of the frame and employ 28.8% of the ICT workforce; 10% of B&amp;I are with 10-49 ICT employees and employ 36.5% of ICT workforce; 1.6% of B&amp;I are with 50+ ICT employees and employ 30.1% of ICT workforce; Freelancers are only 4.6% of the total ICT workforce.</p>
	Market share of top hiring entities	<p>The top hiring entity in the private sector: a private software development company (532 ICT professionals);</p> <p>The top hiring entity in the public sector: Albanian Radio Television (347 ICT professionals).</p>
	Employee retention rate	The employee retention rate is 87.7%.
	Perception on skills shortages of existing supply of ICT professionals	<p>12.8% of ICT workforce face skills shortages; The ICT profiles with the highest skill shortage: “Cybersecurity and Network administration”; and “Database administration and Data analysis”.</p>

## ICT Labor Supply

Facts and Figures:	ICT Graduates by Year of Graduation	HEIs: 2,574 in Bachelor and 874 in Master for 2023-2024 VET: 446 for 2023-2024
	Enrollment in ICT Education Programs	HEIs: 4,507 in Bachelor and 1,286 in Master for 2023-2024
	Number of ICT Freelancers/ Contractors	4,016 freelancers (providers with less than 2 employees)
	ICT Job Seeker number	For 2024, there are 2,024 ICT jobseekers registered with the NAES (696 as ICT unemployed jobseekers and 1,328 as ICT jobseekers).

Education		
	According to the ToRs	Results
Facts and Figures:	Aggregate number of institutions providing education and training	HEIs: 27 universities (10 public and 17 private) offering a total of 137 study programs (76 in bachelor and 61 in master degree); VET: 15 VET schools offering a total of 52 ICT related profiles. Training centers: 9 main training centers
	Rank of institutions	No ranking exist neither for the HEIs nor for the VET system combining the criteria mentioned.
	Amount that firms allocate for training	28% of B&I allocate separate budget funds for training of their employees However, the larger share of B&I provides trainings based on defined training policy (42.2%) and dedicated training structures (33.7%).
	Number of Accredited Institutions	All HEIs are accredited institutionally. Out of the 137 programs offered: (a) 82 not yet accredited / eligible for accreditation / in process of verification / in process of accreditation; and (b) 55 are accredited.
	Tuition Fees	Public HEIs annual fees Bachelor: EUR 200-350 Master: EUR 600-2,000  Private HEIs annual fees Bachelor: EUR 1,500 to 3,900 Master: approximately 2-3 times higher
	Graduate employment rate	HEIs: average of 90% getting employed in their field of study VET: For 2022 graduates, tracing results show that 43% of them are already employed and 41% are pursuing university studies. The rest are either unemployed or inactive in the labor market.
ICT market equilibrium		
Facts and Figures:	Seniority level	19.9% junior; 44.6% intermediate and 35.5% senior.
	Area of expertise	“Software or database developer / analyst / administrator”: 43.7% of total ICT workforce; “ICT technicians”: 21.9%; “System administrator and network engineer”: 17.7%.
	Average time to fill positions	The average time to fill vacancies was 3.1 months. (Public B&I with an average of vacancy fulfillment time of 5 months).
	Forecasted job growth rates	2,505 individuals is the total number of predicted ICT recruitment for the upcoming 12 months, or around 10.9% of the entire ICT workforce (equally the same for the ICT providers and consumers).
ICT market projection		
Facts and Figures:	Forecasted job growth rates	2,505 individuals is the total number of predicted ICT recruitment for the upcoming 12 months, or around 10.9% of the entire ICT workforce (equally the same for the ICT providers and consumers).

## Important findings on the ICT Labor Market



The employment growth of the ICT sector over 2021-2024 reflects a modest rate of 5%. The slight growth of 5% suggests that the claimed vacancies are optimistic compared to the recruitment reality in the sector. Such growth rate might be partly constrained by the emigration of young specialists.



Over 80% of the ICT activity and over 60% of its employment are less than 10 years' operating in the market, which indicates that ICT is a fast emerging sector of the last 10 years in Albania.



The main drivers of the sector – IT service providers (NACE 62-63) – have experienced a remarkable increase in the number of ICT professionals they employ, growing from 4,679 to 10,872 employees (132% increase) over the period 2021-2024. This represents an employment structural shift towards the ICT services provision sector (NACE 62-63), which has overcome the emerging phase.



“Information and Communication” sector (NACE 58-63) has doubled its share in the ICT job market (from 30% to around 60%). This concentrated growth has enhanced the efficiency and competitiveness of Albania’s IT service providers, enabling them to boost exports of their services and solidify their position in the international market.



“Software development” represent the largest ICT occupation (43.7%), dominated by women (59.8%) and by young employees. “ICT technicians” is the 2nd largest ICT occupation (21.9%) and male dominated (85.5%).



The biggest employment concern for the ICT sector is “higher salaries”, which has overpassed the traditional concerns of employers such as the “lack of labor supply”, “insufficient qualification”, and “ICT staff mobility”.



In 2024, nearly half of the B&I has increased the remuneration funds for ICT personnel. 38.1% of businesses reported an increase in the demand for their services over the past 12 months, while 51% expect further growth.



Export activity of ICT providers has gained importance as a share of their overall activity (51.1% of ICT providers involved in export). Albanian ICT providers offer similar services to those in developed countries. Maintaining Albania's comparative advantage in the international market is key for the sustainability of exports due to the competitive pressure of emerging markets.



"Staff training" and "ICT certificates" have increased their importance in the ICT sector, overpassing the "staff replacement" and "improvement of recruitment procedures". Public institutions reflect higher figures regarding both measures.



"On the job training" is the most common form of key training (56% of the frame). "Training by technology suppliers" is the 2nd most used training (23.5%). 1,259 ICT professionals have participated in training courses. "SDA Albania by Protik" is the most frequented center and "Albanian ICT Academy" has the highest satisfaction rates.



Overall, B&I confirm a "Good level of satisfaction" with education institutions. Regarding the developments in education institutions, B&I consider the most important the "periodic and enhanced training of ICT teachers". Two occupations for which B&I recommend strengthening of education are "software or database developer / analyst / administrator" and "system or network engineer / administrator".



Approximately 400 pupils graduate every year in ICT programs from the public VET system. Overall, profiles of Programming, Multimedia and Data Networks have been introduced recently in VET starting with pupils' enrollment after 2020.



There is an increased trend of the ICT graduates in HEIs in the last 5 years (from 5% to 15%). In total, number of pupils enrolled in ICT related profiles in all schools has steadily increased (with a growth rate of almost 30% over last 5 years). In the current context, demand has been higher than the graduated students. It results that in the coming years, the number of ICT graduates can accommodate migration impact.



26.5% B&I had at least one ICT vacancy in the past 12 months. 54.7% encountered difficulties in filling vacancies. Compared to 2021, the share of ICT providers reporting vacancies dropped from 63% to 33.9% and those reporting difficulties in filling them dropped from 82% to 55.4%. B&I either without vacancies or without difficulties in filling them increased from 49% to 78.4%.



The ongoing transformation of the ICT job market in Albania is reaching its peak. While the market was initially marked by workforce expansion, the last three years have seen a reshuffling of human resources from various sectors toward ICT providers. Neither of these trends were observed in 2024. This does not, by any means, suggest that the sector's growth and evolution have come to an end. Rather, it signals that ICT is transitioning from an emerging sector in the Albanian economy to a mature and well-established one.



The IT operations/ support technicians is expected to see the highest number of vacancies over the next 12 months, with 510 new projected recruitments. This represents 18.8% of the current IT technician workforce and is equivalent to the accumulated vacancies for front-end and back-end developers, the core workforce of the sector.



Cybersecurity specialists, are expected to experience the fastest growth in employment, with vacancies accounting for 21.5% of their current workforce, followed by IT technicians at 18.8%, and network and network security engineers at 15.2%.



The comparison between 2024 and 2021 indicates significant declines in key indicators, such as employee turnover and the vacancy ratio. Employee turnover decreased from 19% in 2021 to 10% in 2024, while the projected vacancy ratio for the coming year dropped even further, from 32% to 10%.



As industries become increasingly reliant on technology the ICT staff is either reduced or fully substituted. This shift is reshaping labor market demands, with businesses prioritizing candidates who possess strong ICT skills. Proficiency in ICT is no longer an added advantage—it is rapidly becoming a fundamental requirement for many roles. As such, integrating ICT education into the curriculum builds a strong foundation for future success. As technology continues to evolve, digital literacy will only become more critical—making early ICT education essential for preparing students for the future workforce.



The very limited presence of ICT sector outside Tirana presents a compelling case for prioritizing districts during the implementation of a new ICT education strategy across all school levels. Initiatives such as the introduction of smart labs, teacher qualification programs, high-speed internet, and digital learning platforms should ensure equitable access to digital resources and help to bridge the urban-rural divide and foster inclusive educational development across the country.



The fact that the quantity and qualifications of ICT graduates are no longer primary concerns for B&I - as they were a decade ago—indicates that education institutions have successfully aligned with labor market demands. New challenges are emerging, requiring the entire education system to respond swiftly and strategically. The previous focus on “quantity and quality” must now evolve into a more targeted approach that prioritizes higher quality and better alignment of graduate numbers with the most in-demand ICT profiles.



ICT programs in secondary schools and universities should expand their curricula to place greater emphasis on cybersecurity and database management. These two subjects are not only critical to the evolving digital landscape but are also among the five key competency areas identified in the European Commission’s Digital Competence Framework (Dig Comp).



Software and application development is—and will continue to be for the foreseeable future—the primary ICT service offered in Albania. As such, the education system should prioritize the development of coding skills from an early age, integrating programming instruction into primary, secondary, and vocational school curricula. More broadly, the landscape of ICT services in Albania increasingly reflects that of other European countries. Even in emerging fields such as artificial intelligence and blockchain, there are already hundreds of businesses positioned to deliver expertise. To align with the evolving demands of the high-tech job market, advanced ICT specializations—such as AI, blockchain, and data science—should be given strategic priority within university-level programs.



Java, JavaScript, and Python are the primary programming languages in which businesses and industries most urgently need to strengthen their expertise. Universities and training centers can play a critical role in meeting this demand by offering specialized education and targeted skill-building programs focused on these languages.



There is no longer a pressing need to continuously increase the overall number of university graduates in ICT-related fields. Instead, the focus should shift toward specialization—aligning educational pathways with labor market needs while raising the quality of instruction and learning outcomes.

# Annex 1. The methodology

## 1. Labor market demand and supply

### 1.1 The LM Methodology

ICT labor market demand refers generally to (i) Private sector economic units (in the capacity of ICT producers and ICT consumers), (ii) Freelancers (self-employed) and (iii) public institutions and state-owned companies.

#### 1.1.1 LM Demand in Private sector

The Private Labor Market (LM) Demand refers to all private legal units engaged in economic activities that contribute to the Gross Domestic Product (GDP). These legal units can be either legal entities (such as companies or enterprises) or individuals (physical persons).

An enterprise is defined as the smallest combination of legal units, corresponding either to a single legal unit or to a combination of multiple legal units. The economic activities of enterprises are classified according to the Nomenclature of Economic Activities (NACE Rev 2). The NACE classification is the official system used by the European Union (EU) to categorize industries and sectors of the economy. By utilizing the NACE system, comparisons can be made across EU countries and internationally, facilitating analysis of the ICT sector and its associated occupations.

The main database on the economic activities is the Statistical Business Register held by the Institute of Statistics (INSTAT), which is the major source of statistical information nation-wide. It includes enterprises that are private or state-owned, the physical persons, public institutions and other institutions and organizations. The business register is periodically updated. For purpose of this research study, exchange with INSTAT covers statistics on structural business survey such as the number of private legal persons (companies or physical persons) in the ICT core sector activities and ICT in other sectors and the respective employment providing the information to be used for the extraction of the survey sample.

At the time of conducting the study, the total population of registered enterprises/entities in the business registry was 226,830.

## - Sampling Frame

The targeted population (FRAME) was defined further in relation to (i) status of operation; and (ii) the branch of economic activity.

### (i) Status of operation

The status of enterprises in the business registers was classified according to their current state of activity:

- “Active” - enterprises conducting economic activities.
- “Closed”- enterprises which has permanently ceased the economic activity and will not resume it.
- “Dormant” - enterprises with paused economic activity.

Only “Active” enterprises were surveyed under this methodology.

### (ii) Branches/Sub-branches of economic activity

For the purpose of this research the enterprises were classified in three categories:

- Enterprises whose primary activity is production or distribution of ICT services defined as “ICT service providers” (NACE code J61, J62, J63).
- Enterprises that install and use ICT systems including the ones trading ICT hardware, defined as “ICT service consumers”.
- Public administration institutions/organizations are also classified as “ICT service consumers” (NACE Section O, group 84).

The Economic Activity are used as strata for enterprise under the first two categories. Compared to “ICT service consumers”, the ICT service providers’ stratum has much bigger leverage in the ICT market and it employs the highest qualified experts. The following table presents the NACE codes group by sectors or subsectors on each category (stratum).

**“ICT service providers” (excluding Public Administration)**

**J.61 - Telecommunications**

- J.61.10 - Wired telecommunications activities
- J.61.20 - Wireless telecommunications activities
- J.61.30 - Satellite telecommunications activities
- J.61.90 - Other telecommunications activities

**J.62 - Computer programming, consultancy and related activities**

- J.62.01 - Computer programming activities
- J.62.02 - Computer consultancy activities
- J.62.03 - Computer facilities management activities
- J.62.09 - Other information technology and computer service activities

**J.63 - Information service activities**

- J.63.11 - Data processing, hosting and related activities
- J.63.12 - Web portals
- J.63.91 - News agency activities
- J.63.99 - Other information service activities

**“ICT service consumers” (excluding Public Administration)**

- A - Agriculture, forestry and fishing
  - B - Mining and quarrying
  - C - Manufacturing
  - D - Electricity, gas, steam and air conditioning supply
  - E - Water supply; sewerage; waste management and remediation activities
  - F - Construction
  - G - Wholesale and retail trade; repair of motor vehicles and motorcycles
  - H - Transporting and storage
  - I - Accommodation and food service activities
  - J - Information and communication (partially)**
  - J.58 - Publishing activities
  - J.59 - Motion picture, video and television program production, sound recording and music publishing activities
  - J.60 - Programming (TV and Radio) and broadcasting activities
  - K - Financial and insurance activities
  - L - Real estate activities
  - M - Professional, scientific and technical activities
  - N - Administrative and support service activities
  - P - Education
  - Q - Human health and social work activities
  - R - Arts, entertainment and recreation
  - S - Other services activities
  - T - Activities of households as employers; undifferentiated goods - and services
  - U - Activities of extraterritorial organizations and bodies
-

There were **4,522 ICT service providers** registered, 4,016 of which are freelancers (with less than 2 registered ICT employees) and 506 (B&I, ICT providers) with more than 2 registered ICT employees. A total of 2,390 ICT service providers (53% of the total) had officially zero registered employees with ICT profile. This is explained by the fact that the owners of self-employed ICT service providers who are ICT professionals in their background, are registered as a manager, administrator, general consultant, etc. and not as a ICT professionals. As such, for the purpose of this research this subgroup was included in the “ICT providers with less than 2 ICT profile employees”.

There were **3,506 businesses** with at least one ICT profile employee under the “ICT service consumer” category.

The FRAME composition of ICT LM private sector demand is summarized in the following table.

Subgroups of population of employers by economic activity	Number	%
Active enterprises with NACE code 61,62,63 (ICT service providers)	4,522	56.3%
Active enterprises/ organizations with at least one ICT profile employee (ICT service consumers)	3,506	43.7%
<b>FRAME (Private LM Demand)</b>	<b>8,028</b>	

## 1.1.2 ICT LM Demand in Public Sector

The ICT employment in the public sector has increased over last decade. Differently from the near past when the vital processes of government functions were performed manually, currently, most of the services’ provision of public institutions to citizens and businesses as well as internal work processes are performed using information systems.

The ICT LM demand in the public sector followed the same methodology as for the private ICT labor market demand by referring to public institutions/organizations under group O.84 “Public administration and defense; compulsory social security” in the NACE system. It was decided that the group O.84 be included in the ICT service consumer category during the sample selection methodology together with the ICT services’ consumer category under the private ICT LM demand.

**0.84 - Public administration and defense; compulsory social security**

0.84.11 - General public administration activities

0.84.12 - Regulation of the activities of providing health care, education, cultural services and other social services, excluding social security

0.84.13 - Regulation of and contribution to more efficient operation of businesses

0.84.21 - Foreign affairs

0.84.22 - Defense activities

0.84.23 - Justice and judicial activities

0.84.24 - Public order and safety activities

0.84.25 - Fire service activities

0.84.30 - Compulsory social security activities

During the Inception Phase, considering the importance ICT has taken in the public sector, there was argued that an additional specific stratum and sampling methodology is defined for this sector. The arguments provided were:

- The employer’ profile of major public institutions differs from the employer’ profile in the private sector due to different legislation and administrative framework, recruitment process, salaries and compensation schemes, flexibility in the working place (remotely) and working schedules.
- The activity of ICT personnel in public institutions is of major impact in the social and economic development of the country. Only e-Albania portal alone is currently offering around 1,300 e-services, for 3 million users, generating more than 1 million documents every month for citizens, businesses and public institutions.
- Some institutions like NAIS (AKSHI), NASRI (AKKSHI), NCSA (AKSK) or AAN (RASH) simultaneously perform as “ICT service consumer” and “ICT service provider”. NAIS is the largest buyer of ICT services in Albania and the biggest ICT services’ provider in Albania, offering key ICT services for the general public and running the ICT systems for most central government institutions.
- INSTAT data regarding the ICT personnel have higher accuracy for the private and public companies/enterprises than for public administration institution.
- The number of public organizations in the “ICT service consumers” subgroup is relatively small and risks to be underrepresented in the sample.

The following main Public Institutions have been included in the Public ICT Labor Demand component:

**NAIS**, in charge of ICT management in 24 central government institutions. It currently engages 196 ICT employees and it reports to currently have vacancies for around 42% of the total job positions (the organizational chart envisages 337 ICT employees).

**ICT self-managing public institutions**, including central government institutions outside the jurisdiction of NAIS. There are around 100 institutions tracked through the Department of Public Administration with around 200 ICT employees.

**Justice system.** 5 justice institutions under the Albanian Parliament namely High Prosecution Council, High Judicial Council, High Justice Inspectorate, General Prosecutor, Special Structure against Corruption and Organized Crime were targeted.

**Independent Institutions.** There are in total 25 institutions (independent, organized as agencies, inspectorates, commissions, authorities, and institutes) reporting to the Albanian Assembly (Parliament).

**Local Government Units.** There are 61 municipalities with 132 ICT employees targeted by the survey.

### 1.1.3 FRAME enterprises/institutions for private and public ICT LM demand

The final and complete Frame is composed of 8,161 institutions, businesses and freelancers

Table 2: Frame composition for private and public ICT labor market demand	
Subgroups of population of employers by economic activity and ownership	Number
FRAME (Private LM Demand)	8,028
Freelancers (ICT providers with less than 2 ICT employees)	4,016
ICT providers with 2 or more employees	506
Private enterprises with at least one ICT employee (ICT consumers)	3,506
<b>FRAME (Private LM Demand)</b>	<b>133</b>
<b>Total</b>	<b>8,161</b>

## 1.2 Sample design

### 1.2.1 Private and public ICT LM demand derived from Business Register

The sample design methodology applied to the total frame enterprises (8,161) excluding freelancer's category (4,016) and public administration (133) which are surveyed through a census method. The sampling design process, in addition to the business activity, considered two other criteria, such as business location (businesses operating in Tirana and businesses operating outside Tirana) and business' size - small size (1-9 ICT employees), medium size (10-49 ICT employees) and large size (50 or more ICT employees).

The sample stratification was based on 3 criteria: (i) Economic sector (two economic subsectors as strata, sampling to be conducted randomly); (ii) Geographic area (Tirana and outside Tirana, within each stratum, sampling to be conducted randomly; (iii) Number of employees (small, medium and large). Stratification was

implicit. The sample selection was done using the Probability Proportional to Size (PPS) method, where size = number of employees. This method allowed for random selection across each sector's employees and each location's employee and guaranteed that the largest enterprises in the population be almost certainly part of the sample.

With 2 groups of economic activity (private ICT providers and private and public ICT service consumers), 2 geographic zones, and 3 business size groups the effective sample size is:

$$420 = (2 \times 2 \times 3) \times 35$$

where 35 was the average number of observations considered necessary to provide accurate estimations for each reporting cell. Similar surveys' experiences have shown cases of businesses' refusal to respond to the survey, businesses without contact, out-of-scope businesses and businesses turned recently passive. Also, strata with sub-populations where the respective number of enterprises is smaller than 35 is considered. The percentage of businesses from the sample falling under such categories was around 40%. Correcting the sample with the "fail to interview businesses' rate" theoretically makes unnecessary the need for an additional substitute list of enterprises to address this problem. As such, the sample size would be:

$$420 / 60\% = 700 \text{ enterprises}$$

**Table 3:** Frame Sample distribution results for employers' survey excluding public administration and freelancers

Domains	Size	Population [a]	Sample [b]	Domain weight [a]/[b] (weights before adjustment)
ICT providers Tirana	2-4 employees	173	31	5.581
ICT providers Tirana	5-9 employees	99	47	2.106
ICT providers Tirana	10-19 employees	100	100	1.000
ICT providers Tirana	20-49 employees	18	18	1.000
ICT providers Tirana	50+ employees	4	4	1.000
ICT providers outside TR	2-4 employees	63	42	1.500
ICT providers outside TR	5-9 employees	27	27	1.000
ICT providers outside TR	10-19 employees	21	21	1.000
ICT providers outside TR	20-49 employees	-	-	-
ICT providers outside TR	50+ employees	-	-	-
ICT consumers Tirana	1 employee	1319	73	18.068
ICT consumers Tirana	2-4 employees	424	52	8.154
ICT consumers Tirana	5-9 employees	121	41	2.951
ICT consumers Tirana	10-19 employees	119	75	1.587
ICT consumers Tirana	20-49 employees	26	26	1.000
ICT consumers Tirana	50+ employees	3	3	1.000
ICT consumers outside TR	1 employee	1108	56	19.786
ICT consumers outside TR	2-4 employees	290	38	7.632
ICT consumers outside TR	5-9 employees	61	22	2.773
ICT consumers outside TR	10-19 employees	33	21	1.571
ICT consumers outside TR	20-49 employees	3	3	1.000
ICT consumers outside TR	50+ employees	-	-	-
	<b>Total</b>	<b>4,012</b>	<b>700</b>	

## 1.2.2 Freelancers

INSTAT reports that in addition to 4,255 ICT businesses, there are 4,016 self-employed ICT professionals in the business register. Based on the working model, these individuals can fall under the following categories:

- Freelancers/ consultants/ contractors operating in the local market;
- Registered freelancers contracted by foreign employers;
- Newly established businesses without registered employees;
- Full time employees in one entity contracted also by other organizations;
- Full time employees in one organization, who for fiscal advantages use the business registration as freelancers as cover up of the employment;

To quantify and better analyze the real full-time freelancers from employees of different organizations an explicit question was addressed to the freelancers in their questionnaire.

*“Are you currently working as full time/ part-time employee or service contractor for an Albanian entity for at least 20 hours per week?”*

The “Yes” answers were not counted furthermore as freelancers, but as employees to be targeted under the “Employers’ survey”.

Freelancers Frame composition	
Self-employed ICT in Tirana	2,795
Self-employed ICT outside Tirana	1,221

For collecting information on this category of the ICT LM demand, a census was implemented using a simplified online questionnaire. The link to fill the questionnaire was sent to all the freelancers via e-mail. A very low response rate was expected and also experienced, but since the population was large it was decided as adequate a 5% response rate (at least 200 successful responses).

## 1.2.3 Key public institutions

The sample size for the key public institutions that have ICT personnel was decided to be the entire targeted population detailed under section 1.1.2 of this methodology.

**Table 4:** Profiles and respective numbers of key public institutions

High Judicial Institutions	5
Independent institutions under Parliament	17
NAIS and institutions managed by NAIS	25
Government institutions	32
Local government units	54
<b>Total</b>	<b>133</b>

There are many public institutions which do not have any ICT staff and fulfill their ICT needs through outsourcing.

NAIS completed one single questionnaire with integrated information about 25 institutions under its own ICT management. The same questionnaire used for the ICT service providers and ICT service consumers was used.

The table below is a summary of survey frame, sample, instruments, method and indicators:

Summary information on the framing process and the surveying method				
Entire population of business entities and public institutions: <b>226,830 organizations</b>				
<b>Frame</b>				
Companies/Organizations/self-employed with at least one ICT employee: <b>8,161 organizations</b>				
Private ICT service providers & Private ICT service consumers <b>4,012 businesses</b>	Key Public Administration with at least 1 ICT job position <b>133 institutions</b>	Free lancers (businesses with less than 2 ICT employees) <b>4,016 individuals</b>	No ICT employees: 218,669 organizations	
<b>Survey sample</b>				
Representative sample <b>700 businesses</b>	Census	Census		
<b>Survey Instrument</b>				
<b>Questionnaire No. 1</b> (Unique questionnaire for ICT private providers, ICT private consumers & ICT key public institutions. An additional section dedicated to ICT services offered is addressed to the ICT service providers) Information: total number of employees by gender, profession and seniority level; major ICT employment concerns; sector' economic development trends ( employment and salaries) in last 12 months; trends of demand for ICT products/services in last 12 months and next 12 months; skills shortages of existing ICT staff, by profession and type of skills; reasons for skills shortages; main measures to address skills shortages; vacancies for ICT staff in last 12 months; difficulties in fulfilling vacancies; average time to fill positions, by profession; main measure to fill positions; ICT employees that left the company in last 12 months by profession; number of ICT recruitments by profession, for the next 12 months; training structures / strategies / fund; training type provision; barriers of training provision; level of satisfaction with education system' institutions and with the training centers; perception/assessment on ICT key education system' developments; needs for education measures, by ICT profession.		<b>Questionnaire No. 2</b> Information: ICT employment by gender and seniority level; main job profile as ICT professional; provision of IT services; usage of database related technologies; usage of technologies / programing languages / programing tools; level of export and/or outsourcing of products / services; level of satisfaction with education system' institutions and with the training centers.		
<b>Survey method</b>				
Face to face interviews		Simplified Online Questionnaire		
<b>Requested Indicators</b>				
<b>ToRs Indicators:</b> market share of top hiring ICT professionals; employee retention rate; average time to fill positions; forecasted job growth rates; emerging skills requirements.		<b>ToRs Indicators:</b> number of ICT freelancers		

## 1.3 LM Supply

### 1.3.1 LM Supply Components

ICT employees (according to INSTAT, a total of 21,948 employed in public, private institutions targeted and self-employed as part of the ICT job market demand), the freelancers (more than 4,000), digital nomads and the ICT unemployed jobseekers<sup>45</sup> (according to NAES, around 2,000 jobseekers registered for the last year) were all important components of the ICT job market supply, thus individually relevant to be taken into consideration for the purpose of this study.

During the inception phase, it was discussed to conduct a parallel survey to the employees (thus for the first time, this sectorial study would provide a labor market research /skills and jobs needs assessment providing perspectives of both employers and employees). For this purpose, available and active databases of graduates (Alumni) of the universities (HEIs) and of the VET schools were used.

The questionnaire was sent to the pool of employees through the HEIs Career Guidance Offices and through the NAES (for the VET schools). In addition, employees working for the public sector were alternatively involved through the institutions themselves.

The sample size was suggested to be 200 valid interviews for private employees and 200 valid interviews for public employees, to guarantee a statistical error of less than 7%. The completion of the interviews was expected and proved to depend a lot on the quality of the Alumni database in the universities and VET Schools and their willingness to cooperate. For this reason, the sample was based on a conservative scenario. An increase of the sample size beyond 200 would have minor contribution to a reduced statistical error.

The methodology for the employee's questionnaire was the same as the one for the freelancers. If the number of valid answers were less than 200, phone interviews were used to reach 200 valid answers.

### Supply from Education system.

A total of 14 programs are offered by the VET schools. For the year 2023-2024, around 2,218 are enrolled and taught by around 90 teachers (currently, few vacancies are present). In addition, approximately 400 pupils graduate every year from the public VET system, and according to the tracking results for students graduated in 2022 in ICT programs, 43% of them are already employed, 41% are pursuing university studies, 13% are unemployed and only 3% are inactive in the labor market.

<sup>45</sup> The unemployed jobseekers were addressed through the available information in the National Employment and Skills Agency (NAES). The NAES database provides numbers on the "registered jobseekers with preferential occupation ICT specialist". No disaggregated data were available.

Around 26 universities and other HEIs offer a total of 133 programs (bachelor and master), in the form of pure and combined ICT curricula.

There is an increasing number of pupils in the pre university system learning ICT as a compulsory or elective course (around 16,724 in grade 1, around 6,983 in grade 2, around 55,987 in grade 4-5, more than 9,000 choosing ICT course in grade 11 or 12, etc.).

There is a total of 2,209 teachers teaching ICT in all public and private schools (2,005 of them in public). In addition, it results that only 25% of teachers teaching ICT have a background in ICT and on average, only 15 teachers are licensed per year.

During the inception phase, there has been an exchange with QAAPE, QAAHE and NAVETQ, covering respectively pre-university education, higher education (HEIs=universities), and vocational education (VET). Since schools and universities prepare ICT professionals, they represent an important part of the ICT labor market supply (“current” related to “graduates” and “future” related to “enrolled”).

Information requested and collected from the QAAPE and the NAVETQ during the inception phase, relates to the number of pupils in study programs and/or classes with ICT curricula, curricula description (to explore current trends and alignment with the labor market developments), number of teaching positions (current staff and vacancies) by profile and expertise. In addition, pilot and systemic initiatives in the field of ICT has been part of the discussions held with QAAPE and NAVETQ on the pre-university level of education.

Covering all HEIs, the QAAHE has provided relevant data and information on the ICT programs and curricula in universities (both public and private), number of students enrolled and graduated by ICT programs, number of ICT staff and their profile, as well as labor market studies/traces (if available). Based on ongoing communication and exchange with these institutions (through data formats compiled), the analysis was further focused mostly on qualitative information and quality indicators, such as tuition fees and cost of education, quality of education, reputation and rankings, status of accreditation, etc.

## 1.3.2 Survey method and instrument

ICT LM Supply				
1. Active ICT professionals in the labor market				
Employees		Self-employed / freelancers	Registered ICT unemployed jobseekers	Digital nomads
In private sector	In public sector			
Source and Target				
At least 200 per private sector and 200 per public sector QAAHE and NAES (through existing Alumni databases and tracing systems)			NAES Administrative data	Not targeted
	Through the key public institutions targeted for the ICT LM demand	Through the INSTAT database targeted for the ICT LM demand		
Method / Methodology and tools				
Online questionnaire (link in Forms) Voluntary participation			N/A	
Instruments and Information/statistics				
Questionnaire no.3 <i>Information:</i> profile/expertise/years /sector of employment; level of satisfaction with education system' institutions and the training centers; level of satisfaction with current and future aspects of the job; satisfaction with financial terms; perception on future developments in the job market; trend of salaries in past 12 months; expectations on the carrier for the next 5 years.				
ToRs Indicators				
job satisfaction scores salary growth rates			ICT jobseekers number	
2. Education system Supply for the LM				
Enrolled students and graduated in ICT programs at HEIs		Enrolled students and graduated in ICT programs at VET	Individuals following other formal & non formal education in ICT	
Source				
QAAHE		NAVETQ, NAES Administrative data	NAES QAAPE	
Method / Methodology and tools				
Desk review and Data Formats				
Instruments and Information/statistics				
Enrolled students and graduated in ICT programs at HEIs		Instrument 4: Data Formats <i>Information:</i> digital competences in education; digital skills gap; curricula interventions; digital infrastructure of education institutions; number of ICT staff (teachers) and vacancies (background); CPD of ICT staff; pilot initiatives on ICT; future plans and engagement.		
ToRs Indicators				
ICT graduates by year of graduation; enrollment in ICT education programs; number of accredited institutions; tuition fees; graduate employment rate.				

# Annex 2. : On the Questionnaires

## 2.1 Employers' Questionnaire

### 2.1.1 Employers' questionnaire design

During the inception phase it was discussed and concluded that the three categories of employers (ICT providers, ICT consumers, and public administration), be surveyed with the same questionnaire. The special section for the ICT providers placed at the end would be skipped by non-providers.

The reason behind this decision was to have consistency in questions structure. This allowed for much better quality in data summary, broader statistics, comparison between subgroups and addressing the findings more comprehensively.

### Questionnaire content for ICT employers (providers, consumers and public administration)

The questionnaire for the “ICT employers’ survey” was designed to meet the survey’s specific objectives as per the ToRs:

- Businesses’ profile, ownership, perceptions about the business performance over the past 12 months, expectations about the next 12 months;
- ICT employees’ number break-down by gender, seniority level and major technical profiles in the labor market;
- Skills and employee profile shortages in the labor market;
- Labor mobility in the sector and the related factors;
- Occupations for which current employees lack necessary skills or profile;
- Difficult- to-fill vacancies and average expected time to complete recruitment;
- raining methods, barriers to training, training providers and level of satisfaction;
- Importance of ongoing/planned developments in VET and HEIs; compliance of education developments with business needs by occupation;
- For ICT service providers: the technologies they are offering in the market and for which of them more internal capacities are required, etc.

The questionnaire structure and questions content was based on the previous HDPC questionnaire used for the “Skills Needs Analysis in the ICT sector in Albania – 2021”, which resulted a successful research instrument. However, significant changes were done to the questionnaire of 2021 to better address the objectives of this survey and respond as much as possible to the ToRs.

In line with the above objectives, the final questionnaire contained, after field testing (piloting), about 40 core questions organized into 6 main parts. A simplified version of the questionnaire with only 13 main questions is designed for the online survey of ICT providers with less than 2 ICT profile employees (the freelancers).

Sections		Number of questions
A	General information on the enterprise and ICT employees	7
B	Abilities and skills of existing staff with ICT profile	4
C	Recruitment process and for new vacancies	8
D	On training and relations with education institutions	11
E	Needs for HR capacity (only for ICT providers)	7
F	Information about the interviewing process	3

## Survey implementation methodology

### 2.1.2 Data entry and Quality control:

The data entry process was conducted by experienced operators with SNA databases and similar surveys. After data entry, a random check of operator error was performed prior to proceeding to the next step with a minimal error.

Data integrity was checked using combined methods of filtering, logic, pivot tables, and statistical techniques. Data quality enhancement consisted of correcting data entry errors, filling in missing values by contacting the enterprise or using alternative sources. Additionally, abnormal values or responses were verified by contacting the enterprise for a second verification.

Data normalization (coding and standardization) was the longest and most crucial process in the data recording phase. This process transformed the data into a complete database structure ready to produce statistical reports. Part of this process was also to remove from the data processing the businesses that have changed their main economic activity and whose current business falls outside the scope of this survey.

### 2.1.3 Data processing:

Sample weights allowed for the extrapolation of national and regional estimations based on sampling results. Calculating the survey weight procedure involved three key steps:

- i **Projection weights:** This involved extrapolating sample results to the total population of enterprises and compensating for the fact that observations were made in the sample enterprises and not in all units of the population.

- ii **Adjustment for non-response and deviations:** The overall response rate (i.e., the ratio of the number of enterprises that respond to the selected number in the sample model) almost always differs from the anticipated response rate in the sample model. For this reason, projection weights were adjusted according to the reality (results) that emerged after fieldwork. The same process was done for enterprises that have changed status or activity and recently fall outside the designed population.
- iii **Calibration:** The adjusted sample weights were further calibrated to match known results for auxiliary variables. Calibration was performed at two levels, to match the total number of enterprises in the population and to ensure that the estimated average size of enterprises based on the sample be equal to the average size of enterprises in the sampled population.

Data processing and analysis were carried out taking into account all specific survey objectives, leveraging all opportunities offered by the data collection according to the designed questionnaire.

## 2.2 Employees' Questionnaire

### 2.2.1 Employees' Questionnaire Design

ICT employees' satisfaction was one of the agreed objectives of this assignment. Considering the existing difficulties to directly ask the employees due to the lack of communication platforms with them, a short questionnaire was prepared with key questions in order to measure employee and freelancers' satisfaction (or worries) with their current job and future market developments (here including financial terms). Also questions to measure the level of satisfaction with the education system were included in the questionnaire.

In the case of the freelancers (as part of the supply/employees pool, based on the explanation provided above) the "employee satisfaction" questions are added as appendix in the "ICT providers with less than 2 ICT profile employees" questionnaire.

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## About this report

This study analyzes the ICT labor market in Albania, including demand and supply trends, skills gaps, and future workforce needs. The report aims to support policymakers, education institutions, industry stakeholders, and development partners in improving alignment between ICT education and labor market needs.

This research contributes to AADF's broader mission to support sustainable economic development by strengthening priority sectors and advancing human capital development.

## Disclaimer

The findings and conclusions of this report reflect the work of the authors and are intended to support policy dialogue and sector development. They do not necessarily reflect the official views of AADF or all consulted stakeholders.

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