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SKILLS NEEDS ANALYSIS IN THE ICT SECTOR IN ALBANIA — 2022¹

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Abstrakt

Analiza e Nevojave për Aftësi lidhur me “Programimin kompjuterik, aktivitetet e shërbimit të informacionit”, të cilat janë në themel të industrisë së TIK-ut, ofron informacione të vlefshme rreth profilit të sektorit, cilësisë dhe dinamikës së aftësive, shqetësimeve të biznesit lidhur me rekrutimin dhe punësimin, si dhe rreth qasjeve të zbatuara për trajtimin e këtyre çështjeve. Gjetjet që vijnë si rrjedhojë e kësaj analize tregojnë qartë se, nga njëra anë, sektori ndeshet me trysinë për t’u rritur shpejt e për t’iu përgjigjur objektivave ambicioze që evolucioni digjital po iu vë përpara qeverive, ekonomive dhe shoqërisë në përgjithësi dhe, nga ana tjetër, me rritjen e nevojave për aftësi dhe punësim në një treg të hapur, specifik dhe mjaft dinamik. Për këtë arsye, ato mund të ofrojnë informacion për veprimet e aktorëve të përfshirë në TIK, sidomos, ata të institucioneve të arsimit dhe formimit, për t’u përshtatur si duhet.

Fjalë kyçe: ICT sector; Skills Needs Analysis; Labour market

JEL classification code: L86; J24

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1. INTRODUCTION

The National Employment and Skills Strategy (2014-2022) committed itself to the development and implementation of the Albanian Qualification Framework (AQF). The establishment of Sectorial Committees (SC), as a coordination mechanism between industries and education and training actors, has been deemed critical. The decision on which would be the first Sectorial Committee drew on the conclusions of a study conducted on the key economic priority sectors in Albania (RisiAlbania, 2021) that used a multi-criteria approach (GDP data considering the output structure, the intermediate consumption and added value, the import export data distributed by economic areas, and sector-based employment and wage data), an input-output analysis, integrated with the findings of the business sentiment. The study concluded that the most important economic sectors in Albania, considering the current strengths are (i) Agriculture, forestry & fishing; (ii) Accommodation, food service activities & tourism; (iii) Manufacture of textiles, wearing apparel & leather products, whereas important sectors considering emerging strengths include (i) Computer programming, information service activities; (ii) Legal and accounting activities, management consultancy, architectural and engineering; (iii) Administrative and support service activities.

The National Agency for Vocational Education, Training and Qualifications (NAVETQ) decided that the two first Committees be established on the sectors of “Accommodation, food service activities & tourism” and “Computer programming, information service activities sector”². In addition, the agency decided to commission a Skills Needs Analysis (SNA) for each sector, as an input for the activity of the SCs. The SNA on Computer Programming, Information Service Activities offers valuable insight into the skills’ gaps and dynamics in this area.

² The ICT Sectorial Committee was established in March 2021. NAVETQ has developed internal rules of procedures for the Technical Secretariat and the selection of SC members, as well as other supporting documents. Members of the SC and Technical Secretariat have already been nominated.

2. ICT DEVELOPMENT CONTEXT

2.1. ICT development in EU

The European Union (EU) is the third ICT economy after the United States and China. The most dynamic ICT sectors boasting the largest value-added growth are present in China (13.1%), India (12.1%), Korea (8.9%), the United States (8.8%) and the United Kingdom (6.3%), with growth rates by far exceeding the EU27 at only 5.5%. In terms of ICT employment, the largest growth has been noted in Canada (6.5%), India (6.1%), Australia (5.2%) and Switzerland (4.5%), exceeding the EU27 3.1% growth rate. The EU27 have experienced a sluggish increase of R&D expenses (5.9%), ranking after Russia (26.3%), China (17.4%), South Korea (14.9%), Australia (14.5%), Taiwan (12.9%), United Kingdom (7.5%) and the United States (7.2%). China continues to hold its top position in terms of labour productivity growth that is almost 5 times higher than the EU27 average annual growth rate of 2.5%. On the other hand, Taiwan boasts the largest ICT sector value added share over the total economy (16.3%, compared to 4.6% of the EU27) and the highest ICT sector employment share over the total employment (9%, compared to the EU27 rate of 2.9%) (EC, July 2022).

A leading growing sector, ICT has become a fast-development factor for the other economic areas in the EU. The value added by the EU ICT industry in 2019 equalled 3.8% of the GDP. Between 2014 and 2019, the ICT value added in services across the EU increased by 27.5%, and in manufacturing by 41.7%. Employment within the ICT services in the EU over the same period picked up with 22.8% more compared to 2014. By contrast, the number of employed individuals in the ICT manufacturing in 2019 increased by 13.9% compared to 2014. Half of the workforce in the EU ICT sector in 2019 was deployed in the area of ‘Computer programming, consultancy and related activities’. In 2020, around 19% of the enterprises in the EU employed ICT specialists. In 2019, around 55% of the enterprises in the EU recruited or tried to recruit ICT specialists and reported many challenges in filling their vacancies. Overall, 20% of the EU enterprises provided ICT training for their personnel (Eurostat, 2022).

The European region (46 states) has experienced continued growth in ICT infrastructure, access and use. The Europe's mobile cellular coverage is close to 100%, 98% of population is within reach of a 3G signal and 97% within reach of a LTE mobile broadband signal. The rate of individual internet users has increased to 82.5% and households with internet access are 85.1% (ITU, 2021). The COVID 19 pandemic has had an accelerating impact on digital development. In 2020, digital adoption among European consumers jumped from 81% to 95%³. The most assessed industries were banking, entertainment and social media (McKinsey, 2020).

The latest MC Kinsey Global Survey on Digital Strategy (McKinsey, 2021) confirms that in a new digital edge, that requires a rethinking strategy for a post-pandemic era, the future will belong to companies⁴ that place technology at the centre of their policies, capabilities, and leadership outlook. Some companies already leading the pack show that better overall technology capabilities, talent, leadership, and resources (technology endowment) are linked to better economic outcomes. At the same time, the results confirm that many organizations could be missing opportunities to invest in the areas of their business models that are most at risk of digital disruption.

The pandemic has dramatically increased the speed at which digital is fundamentally changing business. The previous survey showed that across key areas of the business model, companies' overall adoption of digital technologies had sped up by three to seven years in a span of months. The newest results show that this acceleration is also happening at the level of core business practices. Many companies will need to establish or create new digital businesses in 2023 aiming at ensuring an economic viability. Spending on digital and technology increased during the pandemic, despite belt-tightening elsewhere in the business.

The OECD report (OECD, 2022) highlights emerging challenges in the labour market and analyses the impact of the Covid-19 pandemic in Europe on digital

technologies and skills in the global economic system. It takes stock of labour market trends and demands for digital professionals such as software developers, engineers, data scientists, and data engineers. One key insight from the report is the noted high demand for ICT skills like machine learning knowledge, data science, and data visualization. Taking into account the constant evolution of digital technologies and the employment digitalization, the report addresses the challenge of employees' digital transition by providing guidance on strengthening one's skills and getting used to work with (and use) cutting-edge technologies.

On March 9, 2021, the EU Commission presented a vision for Europe's digital transformation by 2030 (EC, 2019), which revolves around four cardinal points: Skills, Digital Infrastructure, Digital Transformation of Businesses and Digitalization of Public Services. Under each point, ambitious targets were set to be reached within 2030. A governance framework and cooperation mechanisms including the monitoring system based on the Digital Economy and Society Index (EC, Digital Strategy policies - DESI, 2022) were approved and additionally, annual progress reports on the state of the Digital Decade, related multiannual strategic roadmaps for the member states as well as a support mechanism for multi-country projects were formulated.

³ The survey covered 20,000 European Consumers.

⁴ The 2021 Survey targeted 1,140 C-level executives, senior managers, and business-unit, department, or division heads representing the full range of regions, industries, company sizes, and functional specialties.

Diagram 1: Pillars of 2030 Strategy



Source: (EC, 2022)

Different EU programmes and initiatives are launched to support the advancement of digital skills and jobs agenda such as:

- ▶ The new European Skills Agenda 2020-2025 aimed at ensuring sustainable competitiveness (in line with the European Green Deal), social fairness (in line with the first principle of the European Pillar of Social Rights) and resilience (based on the lessons learned from the Covid-19 pandemic). It builds upon the ten actions of the EC 2016 Skills Agenda and is also linked to the European Digital Strategy, the Industrial and SME Strategy, the Recovery Plan for Europe and the increased support for Youth Employment;
- ▶ Skills for Jobs in a Green and Digital Economy 2020. To support skills development alongside the digital transition, the EC engaged in: (a) updating the Action Plan for Digital Education, to ensure that digital skills are properly addressed at all levels of education and training; (b) implementing the Digital Europe Program, with a focus on high-level digital skills; and (c) supporting the EU ICT-Jump-Start intensive courses to help the current workforce acquire relevant digital skills;
- ▶ Digital education action plan 2021-2027 - a renewed EU policy initiative to support the sustainable and effective adoption of the education and training systems of EU Member States to the digital age.

The European Commission funds several programmes to support digital learning, such as Horizon Europe and the Digital European Programme, the preceding programmes Horizon 2020, the seventh Framework Programme (FP7), and the Competitiveness and Innovation Framework Programme (CIP) (EC, 2022). The instruments put in place at the EU level for the 2021-2027 budget provide major opportunities for Member States to support the sustainable development of digital skills.

2.2. The Albanian ICT context

The ICT sector has seen an impressive growth over the last decade in Albania. According to INSTAT, the number of registered companies in the ICT sector in the last decade has almost doubled (enterprises with 1-4 employees increased by 53%, and those with 50+ employees increased by 124%), resulting in 40% more people employed (Instat, 2022). In terms of ownership, Albanian-owned companies in the ICT sector experienced an increase by 50%, foreign-owned ones tripled, whereas co-owned companies with Albanians as majority owners increased by 154%. Looking at the key financial indicators, the registered ICT sector enterprises generated 37% more revenues by the end of the decade, supporting 60% more investments and contributing to a value-added increase of 8%.

In 2020, 72.2% of the population in Albania used the Internet. In 2019, household internet access reached 82.2%. In 2020, 99% of the population in Albania was covered with 3G and 98% with 4G/LTE. In many respects, Albania finds itself well above the world average, but despite the noted improvements between 2014 and 2020, on certain key indicators, the country's digital divide with the European Region still remains (active mobile broadband per 100 inhabitants, individuals using internet, (%) fixed broadband subs per 100 inhabitants, and broadband speeds). In terms of connectivity uptake, Albania is significantly lagging behind the EU, with 62.1 subscriptions per 100 inhabitants as compared to the EU27 average of 108.8. Albania provides a relatively affordable internet access, but while the ICT infrastructure is well-developed in urban areas, rural connectivity remains a challenge. The lack of rural connectivity is "one of the major gaps" and hampers growth in the country (UN-ITU, 2022). Important digital transformations have been taking place, including the increased administrative capacity to implement the Government's Digital Agenda. Since 2021, 95% of the public services, or a total of 1,217 of which 300 benefit the business, are offered online.

The private sector, on the other hand, has been slow to keep up the pace in terms of digitalization. Albanian firms have poor technological capacities to allow them to upgrade by absorbing existing advanced technologies. E-commerce is a potential tool to overcome the small domestic economy and limited financial resources of the companies, and to close the connectivity gap between the rural and urban areas. While Albania's electronic commerce sector is emerging, it still lags behind its regional peers. In 2022, 13.8 % of the enterprises had sold products/services via their website or dedicated applications, e-commerce marketplace websites, or applications used by several enterprises for trading goods and/or services. The highest share of e-commerce is carried out by enterprises operating in the information and communication activities (31.6 %), accommodation, and food service activities (29.7 %), and professional, scientific and technical activities (25.6%) (Instat, 2022). The share of employees using computers for work purposes is 31.3 % from 27.8 % that was in 2021.

A digital demand assessment indicates that Albanian economic sectors are at different stages of digital development (RisiAlbania, 2021). The financial and BPO sectors are the more advanced, followed by manufacture, whereas hospitality and tourism together with agriculture lag far behind. Absence of digital strategy in place and a limited budget at the company level are reported to be main obstacles. In terms of skills, agriculture and hospitality and tourism count the lowest numbers in dedicated IT staff and a comparatively low level of skills.

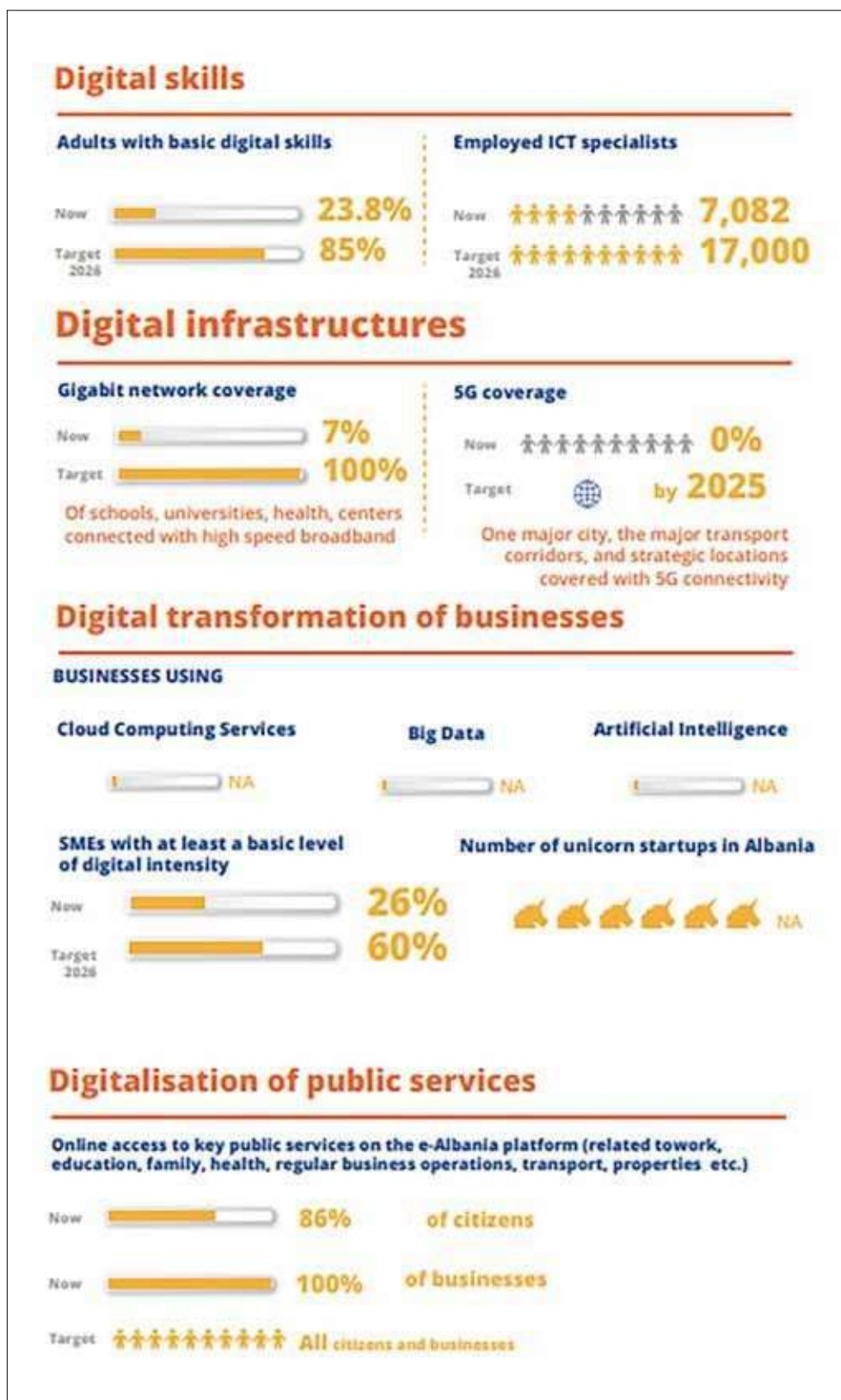
The labour market is lacking digital skills and it offers scarce opportunities for the employees to develop their digital skills. The local ICT sector shows a severe shortage of talent and there is a large gap between the knowledge and skills of IT graduates and industry demands, even at entry level positions lower-level positions. As a result, many companies provide intensive and costly in-house training for graduates, sometimes lasting up to six months (UN-ITU, 2022).

In 2021, 23.8% of the Albanians aged between 16 and 74 years had either basic or above basic digital skills, compared to an average of 56% in the EU27 (Eurostat, 2022). Several policy and strategic documents have been launched to address the challenges of digital skills and digital infrastructure in Albania, such as the Digital Agenda +21, the National Plan for Sustainable Development of Digital Infrastructure - Broadband 2020-2025, the National Education Strategy 2021-2026, the National Employment and Skills Strategy 2023-2030, the National Strategy for Scientific Research, Technology and Innovation 2017-2022, the Strategic Plan on the Fifth Generation (5G) Technology for Albania (AKEP, 2021), Albania's National Cyber Security Strategy 2020-2025⁵, regional strategies, including SEE-2020 and MAP-REA WB6 (RCC, 2022) and the Balkans Digital Highway (WB, 2022).

⁵ CMD No. 1084 dated 24.12.2020.

The main targets to be achieved under Broadband 2020-2025 are:

Diagram 2: Albanian context of the 2030 Strategy



Source: (NAICT, 2022)

3. SNA IN ICT

3.1. Objectives and Methodology Objectives

The Information and Communication Technology is a recent and a complex sector, with new activities and professions constantly emerging. It represents the most dynamic industry, often outperforming many other economic sectors (EU, 2021) and is (i) a key driver of significant changes in the economy; (ii) a penetrating sector in most of the industrial areas and most communities through innovation and development processes; (iii) capable of promoting efficiency and creating conditions for innovation and productivity growth, a more efficient way of connecting people and companies and the creation of new opportunities that have an impact on the living standards; (iv) a competition catalyst, since the companies that embrace ICT and innovation are the most successful in their respective areas. The main ICT SNA objective is to obtain information on: (i) the types of job skills and competencies in demand; (ii) emerging jobs; (iii) occupations with changing skills and (iv) the ability of the training system to meet the needs of industry.

3.1.1 Methodology

Different definitions have been used over the years for the ICT sector. According to the latest one by the OECD, “the ICT industries are those whose products (goods and services) have the objective of carrying out or allowing of information processing the communication thereof via electronic means, including its transmission and visual presentation”.

Under this definition, a correspondence between the activities in terms of the ISIC Rev 3.1 and the NACE-Rev 2⁶ was provided. The scope of this SNA covers all active companies operating in the computer programming and information service activities sector by December 2021. For the survey was used the Statistical Classification of Economic Activities (NACE Rev.2). The information has been grouped in the two-digit level under the following codes: NACE REV2 6201, 6202, 6203, 6209, 6311, 6312. The data correspond to the calendar year which is equivalent to the fiscal year. The size of the company is defined based on the number of full-time employees.

Initially, the target population was split into two groups, namely, companies with 1-4 employees and companies with over 5 employees. The sampling frame for the computer programming, information service activities sector comprises all active enterprises that fall within the scope of the survey, excluding local branches and the enterprises established after September 1st, 2021. A delimitation methodology⁷ has been applied to define computer programming and information service activities within the broader ICT sector, which consists of 2,216 companies categorised in two groups: 1,907 companies with 1-4 employees and 309 companies with over 4 employees. 100% of these companies were targeted by the survey. The survey was conducted online for companies with 1-4 employees and through in-person interviews for the enterprises with more than 5 employees. For further terminology reference, the first survey is referred to as the “mini survey” and the second the “survey”.

Table 1: Company target subgroups and the respective surveying methods

Target Subgroups	Type of questionnaire	Survey method	Expected response ratio	Sample size
1-4 employees	Two sections	Online	Low (10%-20%)	1,907
More than 4 employees	Four sections	Face to face	High (50%-70%)	309

Source: Author's calculations

⁶ Nomenclature of Economic Activities in the European Community.

⁷ Delimitation consists in “defining all possible units that compose ICT at its core activities that contribute to build a stronger economic sector, as well as the identification of the main jobs (professions)/qualifications involved.”

The mini survey questionnaire consists of two sections: (i) **General information** (year of incorporation, ownership, employment, employment concerns) and, (ii) **Recruitment for new vacancies and skills development** through education (vacancies over the last 12 months, challenges in filling vacancies, the way vacancies are filled, expected vacancies for the incoming 12 months, skills and criteria that are difficult to find, the approaches adopted to address unfilled vacancies, IT services, database platforms, programming languages that need staff increase, quality of skills provided in educational institutions, cooperation with VET, need for interventions in the educational institutions to improve skills and competences). The survey questionnaire is composed of four sections: (i) **General information on the company** (year of incorporation, domestic/foreign ownership, employment, employment concerns, the economic trend of the company in the last year and the demand for the offered products and services); (ii) **Abilities and skills of the existing staff** (skills' shortage by occupation, leading causes for having underqualified staff for the job and actions to address existing skill shortage); (iii) **Recruitment for new vacancies** (vacancies over the last 12 months, arising challenges, ways to fill in vacancies, the occupations that left the company, expected vacancies for the incoming 12 months, skills and qualifications that are hard to find, approaches followed to address the vacancies, IT services, database platforms, programming languages that need staff increase); (iv) **Training** (training and level of importance, training barriers, training structures in place, training fund availability, number of trained employees and the delivered trainings, skills' quality provided by educational institutions, cooperation with VET, needs for intervention in the educational institutions to improve skills and competences).

The data collection unit is "Occupation". Wherever possible, information is collected on gender and age-group basis (15-29 years). The survey and mini survey were conducted between December 2021 and January 2022. The survey had a response rate of 60% (the rest either refused or their registered address was wrong) and the mini survey 19%. The lowest response rate in the mini survey (0.7%) corresponds to one-employee enterprises (1,623). The vast majority of companies under this category consist of freelance and sub-con-

tracted professionals registered as "natural entities" (favourable fiscal incentives). **Given the extremely low response rate and the relatively small influence in the market of one-employee enterprises from the skills needs perspective, this business category was excluded from the Frame.** The response rate for companies with more than one employee is about 40 % (19% for the subgroup of 2-4 employees and 63% for 10 to 49 employees, respectively). Using strata, based on the number of employees and NACE code, statistical weights are calculated, which enabled extrapolation of the results for the entire population of businesses.

The survey included 593 companies⁸ of which 237 filled in the questionnaire. The estimated number of companies with more than one employee operating in the sector of computer programming, information service activities (the Frame) is 557, of which 261 companies have over 5 employees. The decrease in companies with more than 5 employees, from 309 in the original target population to 261 in the updated Frame, has two main reasons: the reduction of staff (some employees turned into freelance service providers for fiscal reasons), current activities not matching with the NACE code in the INSTAT registers. The companies in the Frame have 7,371 employees, of whom 4,679 working in IT job profiles.

Non-response adjustment. Design weights were adjusted for non-responses inflating the weights by the inverse of the response rate within each stratum, by size and location. Sampling weights were used for the extrapolation of national estimates, based on the sample results.

Calibration. The adjusted sampling weights were fine-tuned based on the results of the population totals and the nearly unbiased estimates obtained from non-responses.

Data integrity and enhanced data quality control was used to identify data entry errors, missing values, and outliers. Coding under NACE Rev 2 and the International Standard Classification of Occupations (ISCO) is done by INSTAT.

⁸ 36 enterprises in a weighted total did not fall within the scope of the survey, due to changing their main activity or inaccurate classification in the INSTAT enterprise database. As such, they were excluded from the valid data. Additionally, a small percentage of enterprises have increased or decreased in size, falling on a different sample stratum.

Data processing and analysis was carried out in compliance with the specific survey objectives.

Table 2: Frame and Sample. Number of the active businesses in the scope

Number of employees (data before survey)	Target Population (The Frame)	Sample (census)		Response Ratio		Updated size of the Frame	
		Businesses	%	Businesses	%	Activity out of the scope	Population (estimation)
2 -4 employees*	284	284	100%	53	19%	13	296
5 -9 employees	137	137	100%	78	57%	10	92
10-49 -"-	141	141	100%	89	63%	11	140
50-249 -"-	30	30	100%	16	53%	2	28
250-500 -"-	1	1	100%	1	100%	0	1
Total	593	593	100%	237	40%	36	557

*Online mini survey

3.2. Survey Results and Findings

3.2.1 Sector profile and employment

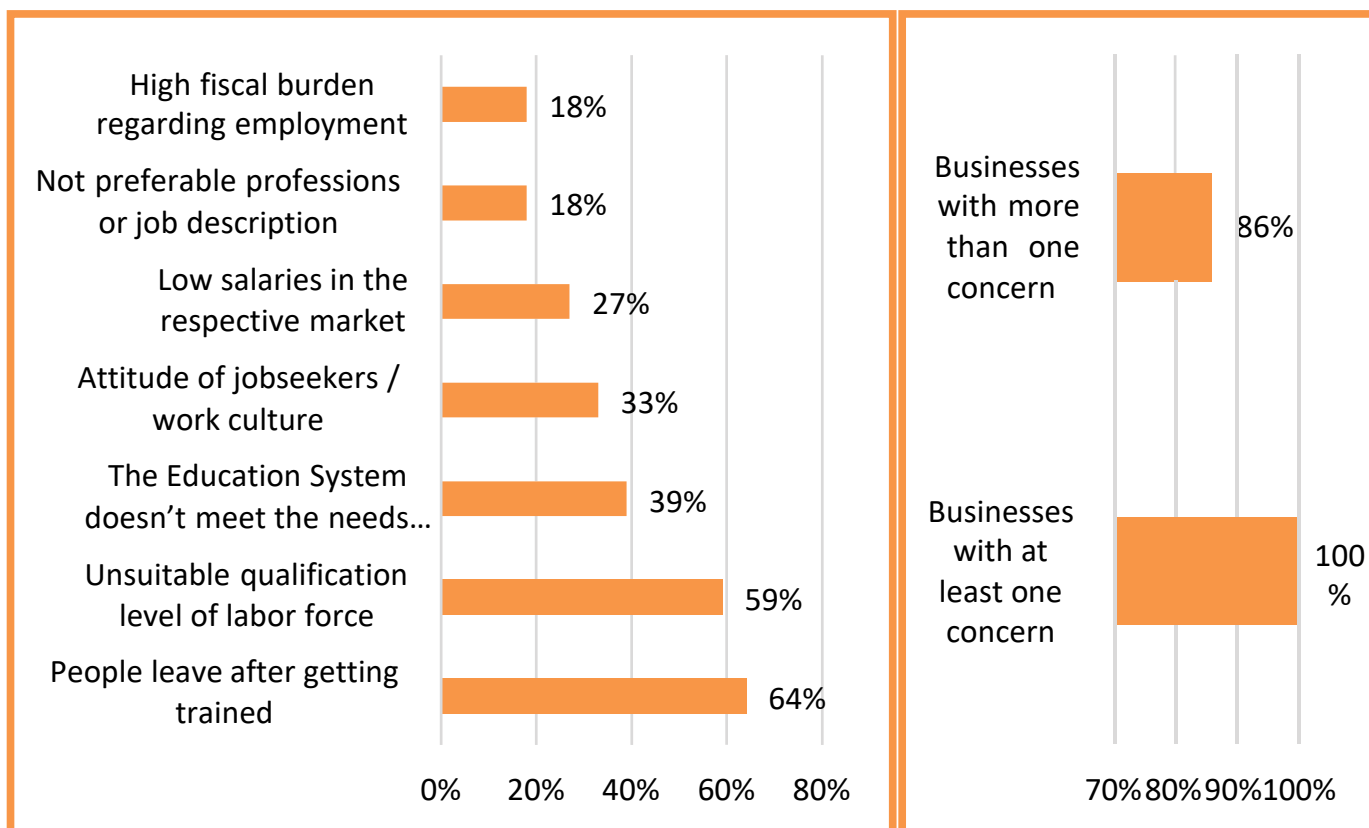
The estimated number of companies operating in the computer programming and information service activities sector in Albania is 2,180 that count 8,994 employees, of whom 6,270 (70%) are engaged in ICT job profiles. The sector is largely dominated by one-employee companies (74%), but the larger share of employment (75% of the IT profile employees) comes from the businesses with more than 1 employee (82%). The SNA is comprised of 557 enterprises with more than one employee that, together, employ 4,679 people in IT profile jobs (63%), the majority whom have a degree in computer sciences, and 2,692 people in other jobs (37%) mainly data entry/ call operators and accountants. 37% of IT employees are females. The sector's workforce is predominantly young, with 64% working as staff and 57% as IT profile employees. The majority companies operating in computer programming and information service activities are in Tirana (81%) and employ 93% of the total sector workforce and 91% of IT profile employees. Durrës is the second most populated region. Domestically-owned businesses are the largest employers in the sector (75%).

The average active company age in the sector is 6 years. More than 25% of the companies are at the start-up phase, 14% have been operating for more than 10 years, and more than half have been established in the last 5 years. Large-size companies constitute a small portion of the sector (5%), but they employ 41% of the workforce. 70% are small companies with 2-9 employees that employ 20% of the sector's working force. Outside the capital, nearly every enterprise is small sized. Medium-to-large companies constitute 36% in Tirana and only 5% in other districts.

3.2.2 Business Employment-related Concerns

Every single business identified at least one concern and 86% of them more than one. Staff mobility after being trained (64%) is the main concern for companies, followed by the under-qualification of the labour force (59%). Wages, job preference and fiscal burden are concerning for less than 25% of the companies (fiscal burden 18%, job description 18% and remuneration 27% in average). Companies stated that employees leave for other employers (inside and outside the sector), to emigrate, work as freelancers or to start their own business. The education system not meeting the needs for skills of the sector was admitted as a concern by 39% of the companies.

Graph 1: The major concerns of employment in the Frame (sorted)



3.2.3 Company Economic Prospects

Companies were asked to offer an outlook of their economic trend for the last 12 months based on three indicators: turnover, employment, and asset value. A total of 57% of the companies reported an increase in at least one of the indicators and stability concerning the other two, which is proof that the ICT sector is growing. 49% of the companies reported an

increased turnover, 44% increased employment and 29% increased assets. On an average, the number of companies showing deteriorating indicators is insignificant (mostly companies based outside Tirana), with 33% reporting a fall in turnover, 38% a decrease in employment and 44% a reduced value of total assets. Enterprises outside of Tirana are small in size and they are largely affected by the IT staff migration to Tirana⁹.

Table 3: The economic trends of the businesses in last 12 months by location (in %)

Indicators	Outside Tirana			Tirana (the capital)		
	Increasing	Unchanged	Decreasing	Increasing	Unchanged	Decreasing
Turnover	40	26	33	50	35	15
Number of Workers	35	27	38	45	41	14
Total	31	25	44	29	68	3

Note: The figures are only for the businesses that 12 months before had more than 4 employees

⁹ Figures refer to the companies with more than 4 employees 12 months before the survey.

54% of the companies report increased demand for products/services over the last 12 months and only 15% have experienced a downward trend in this respect. The sector manifests a highly optimistic outlook, with 70% of the companies anticipating an increase of demand for products/services for the incoming year, whereas only 6% are pessimistic in this respect.

3.2.4 Abilities and Skills of Existing Staff

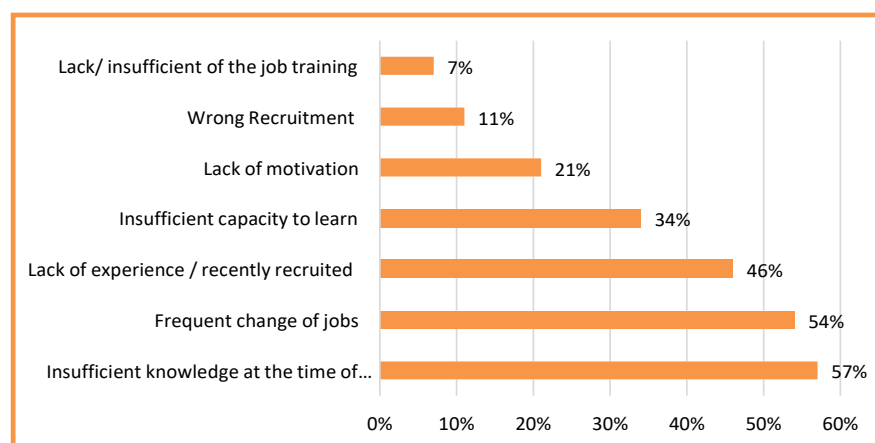
There are 51% of the businesses (which engage 20% of employment in the sample and 11% of employment in the sector) declaring skills' shortage for 24 occupations. Programmer/Software Developer is ranked the first with noticeable skills' shortage (264 employees) followed by IT support specialists (60 employees) and technicians for FO/data networks (32 employees). There is a very different picture of the skills shortage in locations outside Tirana, 49 cases with skills shortage (7% of the total number) refer to installation and support of the ICT systems. After aggregating the 9 software profiles, it results that 50% of the employees with skills shortage refer to "installation and support of the ICT systems", which represent the larger occupational group in IT companies. The second largest group is "system administrator". 15% (102 employees) of the existing system administrators are declared to have skills' shortage. Technicians for FO/ data network is the most quoted occupation with skills' shortage outside Tirana meaning that even cabling technicians are difficult to be found with the necessary skills, while 1/3rd of the population lives in these areas.

80% of the total number of employees in the surveyed businesses and 89% of the total number of the employees in the Frame are with adequate skills. Software developers and programmers result to be the most skilled occupational group. For those with inadequate skills, the enterprises are asked on 10 lacking skills and requirements (professional skills, ability to learn at the job place, creativity and innovation, communication skills, ability to identify & solve the problems, organizational skills, foreign languages knowledge, ability to work directly with clients, possession of professional ethics, ability to work in a Team)¹⁰. "Professional skills" are the most reported skills' shortage (75% of the cases) followed by "ability to learn at the job place" (41%) and "creativity and innovation" (40%). Ability to work in team, professional ethics and ability to work with clients are the least quoted skills with shortage. IT support specialist that lack professional skills (97%) do lack also many other skills simultaneously such as communication skills (92%), creativity and innovation (84%), organizational skills (84%), ability to learn at the job place (75%), ability to identify & solve the problems (72%), foreign languages knowledge (72%).

3.2.5 Causes for skills' shortage and ways to address

Insufficient knowledge at the time of recruitment is the most frequent cause of the skills shortage (57% of the cases), followed by frequent change of jobs (54% of cases) and lack of experience/recently recruited. Neither wrong recruitment, nor insufficient job training are causes for the identified skills' shortage.

Graph 2: Frequency of causes that staff is not enough qualified (sorted, % over total number of cases)



¹⁰ Each company had the options to choose 0-6 professions, so a minority is represented with more than one profession in the aggregate figure, 1 case = 1 employee having 1 skill shortage on its job position.

The businesses declare that increase of trainings (31%), improvement of recruitment procedures (30%) and staff replacement (25%) are used to address the existing skills’ shortage. Outsourcing of services to specialized experts/ companies or certification/licensing programs (which are a step beyond training), hiring foreigners or exploiting state employment schemes are highly exceptionally used.

Graph 3: Businesses’ actions to address skills shortage of the current employees (sorted, % over total number of cases)

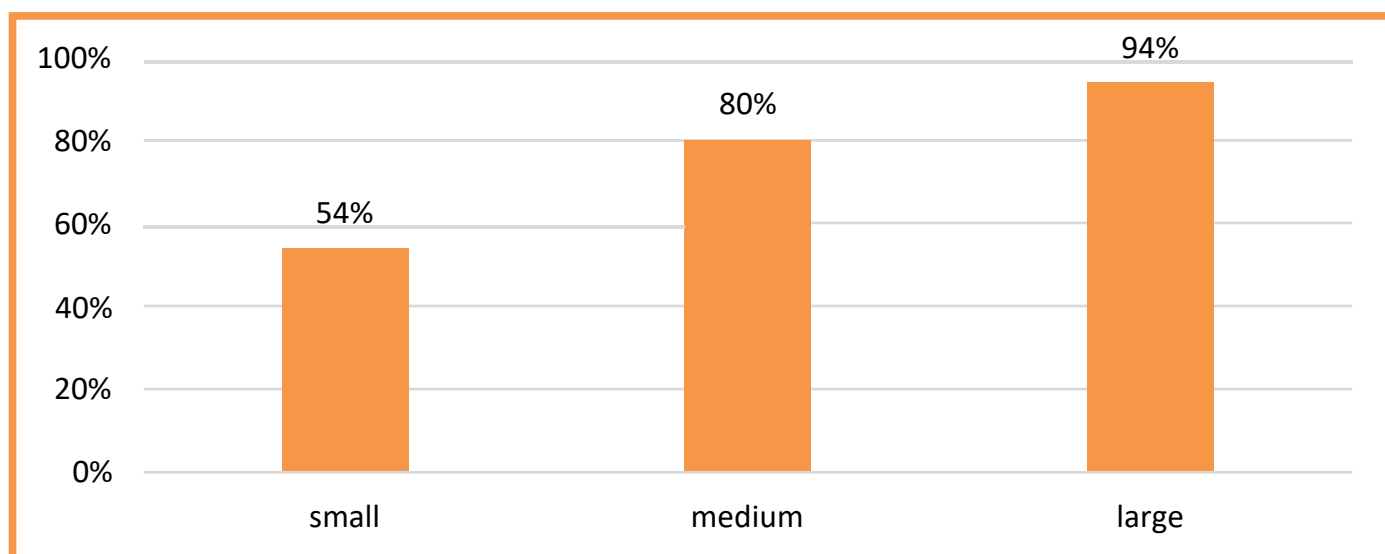


3.2.6 Recruitment for new vacancies

63% of the businesses declare to have had a staff increase over the last 12 months. Over 80% of the medium and large size businesses and 54% of the small businesses in the Frame declared to have had vacancies over past 12 months. Filling vacancies seems a rather challenging task for companies in and out of Tirana, with 90% of the companies operating outside of the capital and 79% in the capital reporting difficulties

in hiring employees. Announcements in dedicated job portals and/or social media is the top most used method (it is the first option in 36% of the cases), followed by postings on the company website (28% of the total cases). Referral from acquaintances, relatives and friends is the second/third option (28%). Public employment offices or private head-hunting agencies are used quite rarely to fill in vacancies.

Graph 4: Frequency of businesses having vacancies in the last 12 months by size (total of 349 businesses)



3.2.7 New Recruitment Challenges

Companies were asked to assess the challenges they faced filling the vacancies for 5 occupational groups, respectively, “managers”, “experienced ICT specialists”, “junior ICT Specialists”, “helpdesk and support” and “sales and marketing” in a range of difficulty from one to four, where 1 was “there is no existing difficulty” and 4 was “significant obstacle”. Companies rank the aspiration of applicants to migrate as the main recruitment obstacle for each occupational group. They confessed that they would not prefer and often avoid hiring candidates with future migration plans, as it is costly and disruptive for their business. Four out of five occupational group fall within range 4 or under “significant obstacle”, due to the candidates’ migration plans. “Insufficient work experience” is reported as the second biggest obstacle to find recruits, whereas other listed obstacles such as “insufficient supply of specialist with adequate skills”, “expected short length of stay in the company”, “unattractive wage level”, “non-adequate formal education” etc., fall between the low-to-average range of difficulty. Soft skills such as communication, appropriate demeanour/integrity, positive attitude learning attitude are assessed as minor hiring obstacles. Future migration seems to have eclipsed all other difficulties.

3.2.8 Staff mobility

Companies were asked about the occupations and

respective number of employees who had left the company over last 12 months. The estimated aggregate figure was 1,095 employees (885 having an IT profile). The average IT staff turnover is 19%, namely, 2.7 times higher than that of the non-IT personnel (7%). In terms of occupations, the largest group of employees that moved out of their companies over the last 12 months is “software engineers and developers” (650 experts or 59% of those who left). The second most mobile occupational group is “system and network engineers” (186 experts or 17% of those who left).

3.2.9 Future Employment Prospects

Of the total number of the companies in the Frame, 59% have stated to have new staff recruitment plans for the coming 12 months. The intended total number of the new staff to be recruited is 1,948 people, which represents a 26% employment growth in the Frame. About three quarters (1,478 people) will be IT-educated specialists. Assuming that the companies will be successful with their recruitment plans, the number of the IT specialists in the Frame will increase by 32%. That is an ambitious and hardly feasible goal, considering the current labour market supply and the high emigration pressure.

A growing demand for programmers/ developers has increased the average remuneration level for them. Companies report that the entry-level/junior salary is the highest in the labour market. The statement is

supported by the official. Recent INSTAT data show that the average gross monthly wage in Albania is ALL 59,242. The ICT sector staff is the second most paid after the financial and insurance group of activities, but the salary growth rate is much higher for ICT sector than for financial and insurance activities (33.5% vs. 12% since 2019). The growth rate for non-IT staff is about 17%, which is also high (Instat, 2022).

Companies expect to have 950 new vacancies for “software engineers and developers”, which is almost half of all the forecasted recruitment in the Frame (49%). 737 software engineers and developers (38% of total new recruitment) will be programmers/developers, while 213 of them (11%) will be software architects, web designers, DevOps, testers, etc. The second largest group of new recruitment over the next 12 months, is “system and network engineers”, with 469 vacancies or 24% of the total. Recruitment in the non-IT professions is dominated by operators (8%) and accountants/economists (8%). The demand for accountants in the sector comes from the companies offering remote outsourcing support related to CRM/ERP applications.

It seems that recruiting IT-profile staff is more challenging compared to non-IT ones. This is true for any single profile within the broad IT profile group. New employees with profiles like DevOps, IT engineer/system admin, non-IT engineer, IT technician (outside the capital), senior developer, are difficult to find in over 95% of the cases, whereas other profiles such as software design analyst, accountant, digital marketing expert, business consultant, operator, etc. generally do not pose any difficulties to fill in. At least 78% of the vacancies in the Frame companies over the next 12 months will prove challenging to fill in.

3.2.10 Skills criteria/requirements difficult to find

Companies report that what job applicants lack the most are work experience (75%), professional skills (72%), interest/motivation for that kind of job (54%) and the ability to identify & solve the problems (44%). Other listed skills/requirements are less challenging to find. Companies were asked what skills/requirements were the hardest to find for the 7 occupational groups,

namely, software engineers & developers, system & network engineer, non-IT expert, operators & support jobs, sales & marketing, IT technicians, project manager. The range of difficulties varies among professions. Professional skills (91%), communications skills (68%), work experience (85%), interest/motivation for the kind of job (81%) and ability to identify & solve the problem (74%) are the most frequent requirements/skills that companies find difficult to meet. Hard-to-find skills/requirements for each job profile include: (i) System & network engineer- *professional skills (91%), ability to identify & solve the problems (74%), communication skills (68%), work experience (85%) lack of interest/motivation (81%)*; (ii) Non IT Expert - *Work experience (63%)*; (iii) Sales & marketing - *work experience (62%), professional skills (53%)*; (iv) IT technician - *professional skills (72%), adequate education level (66%) and lack of interest/motivation 78%*; (v) Project manager - *work experience (77%)*. Generally, job applicants in the categories of sales and marketing, operators and support jobs meet the skills and requirements of the companies in the Frame.

Different approaches are used (often in combination) to mitigate the issue of filling vacancies. Enhancement of the recruitment procedures (51%), training of existing staff through privately hired training providers (50%) and increase of the salary and benefits (44%) are the solutions applied most frequently by companies. It is very rare for them to rely on a State employment/training scheme as a way out, with only 6% of the companies reporting to have used it.

Companies were asked to identify the IT services for which they need staff capacity/skill building. We found that they to use a very wide range of IT services as part of their daily activities, which is imposed by the small market size. There is not enough market room for specialist services. Software and application development are the widest used services in the sector (88% of the companies), followed by web designing services (73%). These are also the services more often in need of additional capacities or skills for 44% and 31% of the companies in the Frame, respectively.

The majority of the companies in the Frame (53%) have a certain established level of operation with da-

tabase management, which demonstrates a significant presence of the database management in business operations. Overall, about 31% of the companies are in need of more capacities for at least one database platform. About 22% of the companies already have sufficient capacities in place. The most used database platform/technology across the sector is MySQL, (43% of the companies). 18% of the companies in the Frame need additional capacities or skills related to its operation.

Most of the companies in the Frame (56%) report they operate with programming languages, about 36% of the companies need increased capacities for at least one programming language they use, and nearly 20% already have sufficient capacities in place. The most used programming languages across the sector are HTML, Java and JavaScript (used by 44-46% of the companies). These are also the programming languages where additional capacities or skills are needed for an estimated 18% - 20% of the companies in the Frame. The reason why a basic and simple language like HTML is a top priority for companies is an indicator of the robust presence of small companies working mainly in front-end programming for websites or web applications.

3.2.11 Training

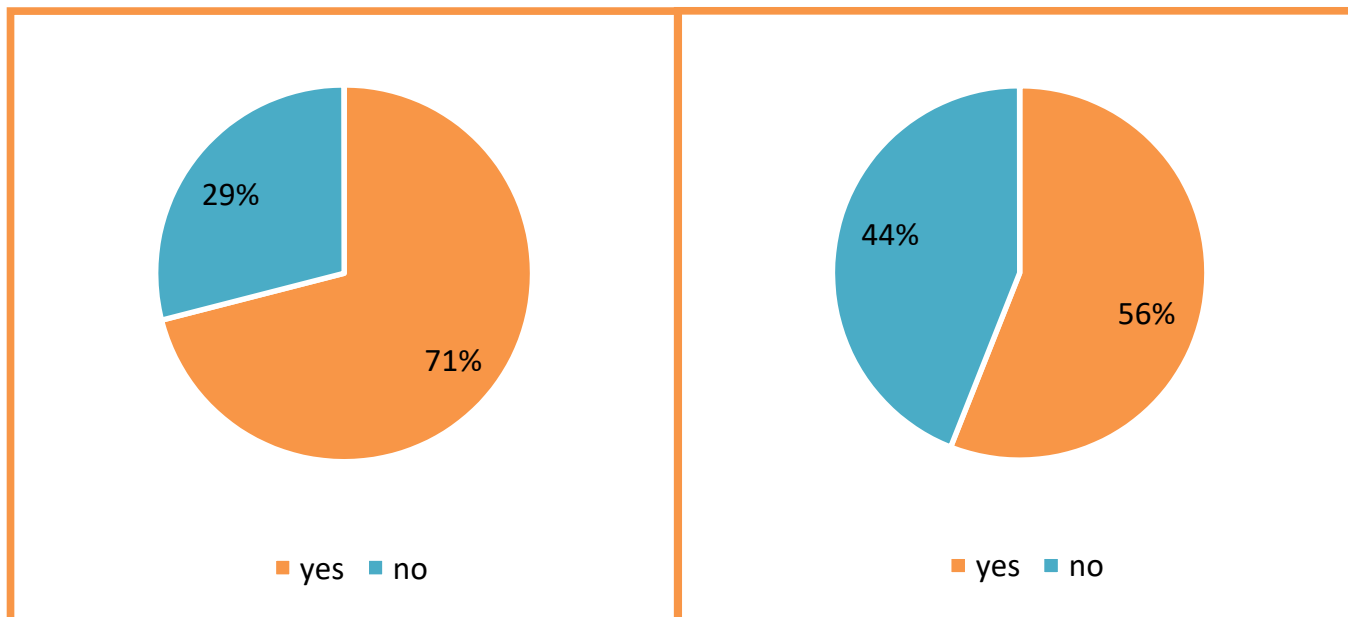
On-the-job training from experienced company staff is the most frequent type of training applied by 90% of the companies, with 69% of them considering it as very important. The second most frequent training method used by companies is training from technology suppliers (55% of the companies). Certification programmes on international standards/brands (Cisco, Microsoft, Oracle, HPE, Dell, ITIL, CompTIA, etc.) are used as a benchmark in the sector, but it appears that large companies as well consider them to be of great importance. The staff of 75% of the large companies go through international certification programmes, and all large companies state that certification is important. The least used training is from vocational schools/centres (9% of the businesses), training from a public training institution (10%) and from private training providers (17%), while training abroad is used by 32% of the businesses, although it is costly.

Companies usually cover all the training cost (through Government programmes, donors and employees are completely excluded as a source of financing for the training). This explains why companies are concerned about the high mobility of trained employees along with the low supply in the labour market.

Scarce training funds seems the second most important barrier for training (46% of the companies), following the frequent workforce mobility (50% of the companies). Insufficient time for training (23%) is another barrier. Lack of trainers in the local market and lack of staff motivation to attend training are insignificant barriers.

Considering these training barriers by the size of the business, we find that frequent workforce mobility, a lack of courses and difficulties in finding trainers are mostly seen as barriers among large-sized companies (76% vs. 47% and 31% vs. 18%, respectively), whereas the scarcity of training funds ranks higher for small and medium size enterprises (49% vs. 19%). Most businesses have a training structure or budget (71%) and there are 56% of the businesses declaring to have a separate training budget. Generally, companies use both local (61% of the companies in the Frame) and international training experts (49% of companies in the Frame). Coaching by local trainers (63%) and webinars for international trainings (89%) have been reported as the dominant training method by the business.

Graph 5: Frequency of having a training structure (part A) and separate training budget (part B) for medium and large companies



Most companies (54%) did not organize any training over the last 12 months. A total of 1,386 people or 19% of the entire staff in the sector received training. Almost all trained employees (1,324 or 96% of the total employees) are from companies located in Tirana. Small and medium size enterprises have a relatively higher ratio of trained employees compared to the large ones (21% vs. 16% respectively). Over last 12 months, 407 training sessions were reportedly delivered in the sector (an average of 3 to 4 employees per one training session: $1,386 / 407$)¹¹. Around 63 training sessions or 15% of the total were not directly related to IT knowledge/skills. Near half of the trainings sessions (48%) fell under the category of programming languages and platforms, followed by ICT systems and their integration (21%). The rest were delivered by an insignificant number of companies.

An exhaustive list of delivered trainings is presented. Front-end languages training sessions (React, Javascript, HTML, etc.) were the most frequently delivered. The second most delivered training was full-staff development (a total of 48 training sessions). It is evident that the main focus of the IT services in Albania is on the front-end programming/web development. That

coincides with the previous survey findings that highlighted front-end capacities as the skills most frequently skills in the company compared to other skills. The spectrum of training subjects related to programming languages and platforms is really wide, which is another evidence of a blooming programming market in Albania. On the downside, there are relatively few training sessions focusing on modern technologies, like I-cloud computing, artificial intelligence and block chain.

Companies are relatively satisfied with what education offers at every level. The higher the education level, the larger the share of companies that are satisfied or very satisfied. Thus 57% of the enterprises report to be satisfied with the level of skills and competences acquired in the secondary education. This figure increases to 75% for individuals who hold a master’s degree. However, cooperation between the business and education institutions is at a low level. One fourth of the companies cooperate with the universities, and only 8% cooperate with secondary vocational schools. Business companies are supportive of every single ongoing/planned development in the educational institutions that contributes to quality education. The absolute majority of the companies consider them important or very important.

¹¹ A training series means trainings done by one company for a specific profession for a specific subject: 1 training series = 1 company x 1 profession x 1 subject x N employees x C sections/classes.

The following profiles are indicated to have an increased number of students:

Table 4: Number of students per profile indicated

Profession/Specialty	Number of cases
Software engineers and developers	572
System and network engineers	284
Non-IT experts	80
Sales and marketing	28
IT technicians	26
Operators and supporting jobs	13
Project managers/ coordinators	6
Total	1,009

Case = 1 business x 1 profession group x 1 specialty

4. DISCUSSIONS ON MAIN FINDINGS

- ▶ Albania has an estimated number of 2,180 companies operating in the sector computer programming and information service activities in Albania, with 8,994 employees, of whom 6,270 (70%) working in ICT jobs. The sector is dominated by one-employee enterprises (74%), mostly based in Tirana (81% of the companies/91% of the ICT employment), largely domestically owned (75% of employment), male-dominated employment (63%), young age companies/ employees (6 years old/ 57% of the IT jobs have 18–29-year-old employees).
- ▶ While every company has reported at least one concern and 86% more than one, the major issue is staff mobility after being trained (64%) and labour force under-qualification (59%). The salary level, terms of reference for the job and the fiscal burden are concerns for less than 25% of the business in the sector. 39% of the companies feel that education system does not meet the needs of the sector for skills. The average IT staff turnover is 19%, which is 2.7 times higher than the overall staff turnover of the non-IT personnel (7%). Software engineers and developers are the largest occupational group that moved out of their companies in the last 12 months, followed by system and network engineers.
- ▶ The sector is growing. Over the last 12 months, 57% of the companies reported growth in at least one indicator and stability in the other two (turnover, employment and value of assets). It was quite the opposite for companies operating outside of Tirana, who reported decline in activity and are largely affected by the IT staff migration the capital city. The sector remains highly optimistic for the future. The majority of the companies, 70%, anticipate an increase of demand for products/services in the coming year, with only 6% showing a pessimistic outlook.
- ▶ The large majority of the sector employees has adequate skills. Occupations like programmer/software developer, IT support specialists (60 employees) and technicians for FO/data networks show skill shortage. Installation and maintenance of ICT systems represent the largest occupational group reportedly suffering from skill shortages in the IT companies not based in Tirana. In other words, findings indicate that outside of Tirana there are difficulties in finding even skilled cabling technicians, while one third of the population lives

in these areas.

- ▶ “On-the-job learning ability” and “creativity and innovation” are the most lacking among 9 listed skills apart from the professional ones (ability to learn on the job, creativity and innovation, communication skills, ability to identify & solve problems, organizational skills, foreign languages competence, ability to work directly with clients, having professional ethics, ability to work in a team). Under skilled IT support specialists (the larger in IT businesses) also show problems in communication skills, creativity and innovation, organizational skills, ability to learn at the job place, ability to identify & solve the problems, and competence in foreign languages. Training, improved recruitment procedures and staff replacement are used to address the existing skills’ shortage. Outsourcing of the services to specialized experts/companies or certification/licensing programmes, hiring of foreigners, or the use of State employment schemes are exceptionally rare.
- ▶ Most of the companies reported vacancies over the last 12 months, but filling them seems a very difficult task for almost all of them, inside and outside Tirana. Announcements in job portals and/or the social media is the most used method, while referral from acquaintances, relatives and friends is used as second/third option. Public employment offices or private head-hunting agencies are very rarely used for recruitment. The applicants’ aspiration to migrate is reported as the main difficulty companies’ face when it comes to recruitment, while all the other difficulties are of minor importance compared to that. Candidates with plans for future migration are avoided, as they are considered costly and disruptive.
- ▶ 59% of the companies in the Frame report an average staff increase of 26% (75% hold an IT degree) in the coming 12 months, a very ambitious target considering the current supply and the high emigration pressure. It is expected that 78% of the vacancies in the Frame companies in the next 12 months will be difficult to fill in. There is a high demand for programmers/ developers. Companies state that entry-level/junior position salaries are the highest in the labour market (according to INSTAT, ICT sector staff is the second most paid after

financial and insurance group of activities, but with a higher salary’ growth rate (33.5% vs. 12% since 2019). Software engineers and developers comprise almost half of all the forecasted recruitments in the Frame (49%), followed by system and network engineers. Almost in all the cases, the most difficult to find are the people with the profile of DevOps, IT engineer/System Admin, non-IT engineer, IT technician (outside of the capital), senior developer, whereas vacancies for software design analyst, accountant, digital marketing expert, business consultant, operator, etc., are not difficult to fill.

- ▶ The hard-to-find skills/criteria for each job profile include: (i) system & network engineer- professional skills), problem identification & solving skills, communication skills, work experience, lack of interest/motivation; (ii) non-IT expert - work experience; (iii) sales & marketing- work experience, professional skills; (iv) IT technician - professional skills, adequate level of education and lack of interest/motivation; (v) project manager - work experience. Improvement of the recruitment procedures, investment in training for the current staff by hiring private training providers and the increase of remuneration and benefits for the employees are the most applied solutions by the business.
- ▶ Specialized services are not yet an option for IT businesses due to the small market size. Software and application development followed by web designing services are the most used services in the sector. The majority of the companies in the Frame have a certain level of operation with database management. The most used database platform/technology is MYSQL. Most of the companies stated that they operate with programming languages and need more capacities for at least one programming language they use. The most used programming languages are HTML (a basic and simple language due to a robust presence of small companies working mainly in front-end programming for websites or web applications), Java and JavaScript.
- ▶ Software engineers and developers, system and network engineers, non-IT experts, sales and marketing, IT operators and supporting jobs, technicians, project managers/ coordinators are the profiles expected to see an increased number of students.

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