

01

EU Digital Professions from different perspectives

Comparison of the national reports



July 2019

Content

- Introduction..... 3
- Methodology 6
- The most demanded Digital Professions..... 7
- The most demanded Digital skills..... 9
- European Digital Professions Competence Framework..... 10
 - The Trainer Digital Professions Competences..... 10
 - The Trainee Digital Professions Competences 10
 - The original and new learning/teaching methods 11
- Conclusions..... 13

Introduction

The survey aims to present current situation of employment related to new required jobs and skills in the period of digitalization. The report is the result of national's surveys of involved countries (Czech Republic, Portugal, Spain and Greece).

Digital technologies generate new business opportunities through new production processes, new products and the creation of jobs. Digitalization brings transformations of tasks and jobs and changes working conditions.

At sector level, the biggest gap in terms of digitization, is found for utilities, manufacturing, government, professional and business services. The finance and insurance sector exhibit the smallest gap.

Digitalization entails both opportunities and risks for the labour market, but it remains difficult to predict. In the future, it is predicted the creation of many knowledge and skill-intensive jobs, but also many disappearing jobs. Most new jobs will be in knowledge and skill-intensive occupations, such as high level managerial and technical jobs. On the other hand, digitalization and automation can lead to job losses.

In the following table (Table 1) you can find statistics of Employment in technology and knowledge- intensive sectors. Spain has the highest values (around 700 thousand). The Czech Republic, Portugal and Greece have significantly lower values (between 100-300 thousand), but the number of people has been increasing in recent years.

Table 1¹

Employment in technology and knowledge-intensive sectors (in thousands)

	2009	2010	2011	2012	2013
Czechia	197.4	209.4	221.2 ^(b)	215.0	226.9
Greece	99.2 ^(b)	99.2	86.7	81.7	85.3
Spain	622.4	635.3	658.2	652.9	636.8
Portugal	110.4	109.7	96.6 ^(b)	98.4	107.8
	2014	2015	2016	2017	2018
	238.2	229.2	242.0	243.6	261.9
	89.8	85.7	90.4	93.8	105.6
	629.1	656.0	656.6	706.2	699.0
	122.9	123.0	125.2	134.1	143.2

¹ Source: <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do> (2019)

Labour markets have experienced a profound polarisation in recent decades. The share of employment in middle-wage jobs has declined, while employment in high- and low-wage jobs has increased. The trend indicates declining per-capita employment in occupations with a high content of routine tasks – activities that can be performed by following a well-defined set of procedures and are therefore relatively easy to automate.

Spain survey commented the growth in demand for positions related to data management, as well as Profile SEO Specialist, the digital Designer and the Digital Business Manager, aimed at developing digital business. There are new jobs that do not necessarily belong to the IT department but also support other areas such as marketing, sales, e-commerce, customer service, business analysis, research and development.

The transformation of work also implies different skills requirements. Almost half of the EU population lacks basic digital skills and some of citizens having none at all.² This could lead to growing skill gaps and further mismatch in the labour market. The new skills needed require reforms in vocational education and lifelong learning in order to deliver more general and specific digital capabilities, but also new models of learning, including workplace training. E-learning, web-based educational material, distance studies and online university programmes are ways to offer flexible learning pathways to students and workers. For example, several private and public initiatives/projects have been launched in Portugal in order to promote digital literacy among children and adults.

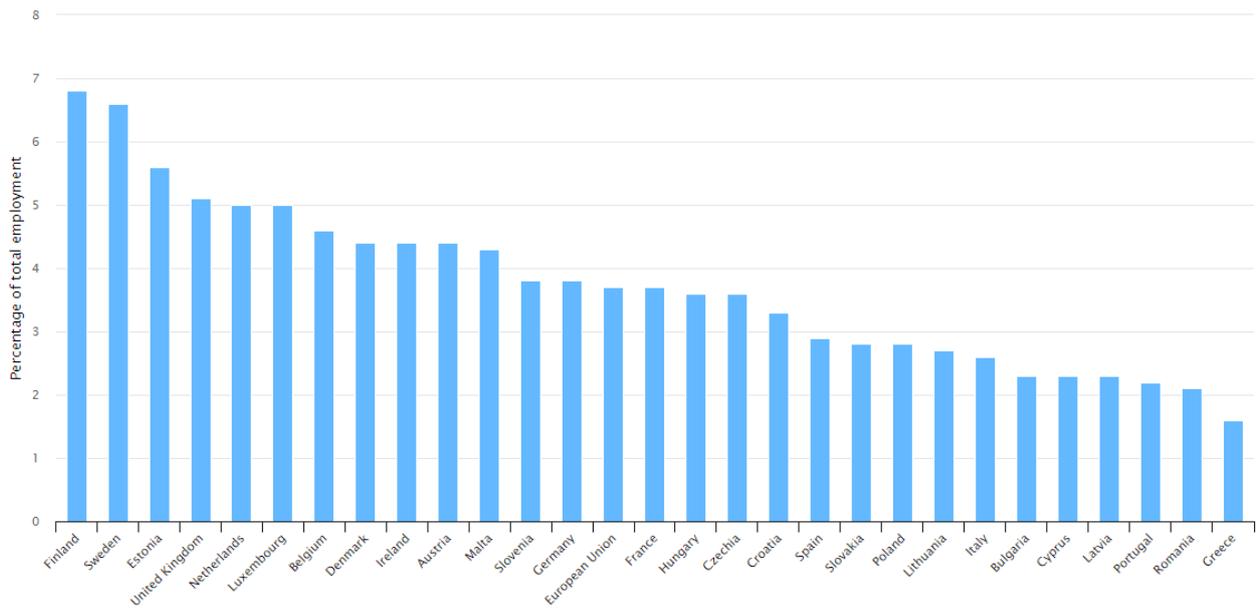
In the following table (Table 2) you can find the European statistics concerning the percentage of total employment of ICT Specialists in the European countries – it is important for comparison of the partner countries. It is interesting that the Czech Republic has the more employment in that sector with comparison of Spain, Portugal and Greece.

The third table (Table 3) is focused on ICT graduates in the particular EU states. Percentage of graduates in ICT is higher in Czech Republic and Spain, however, Portugal and Greece are under average with the comparison of EU context.

² Europe's Digital Progress Report 2017

Table 2³

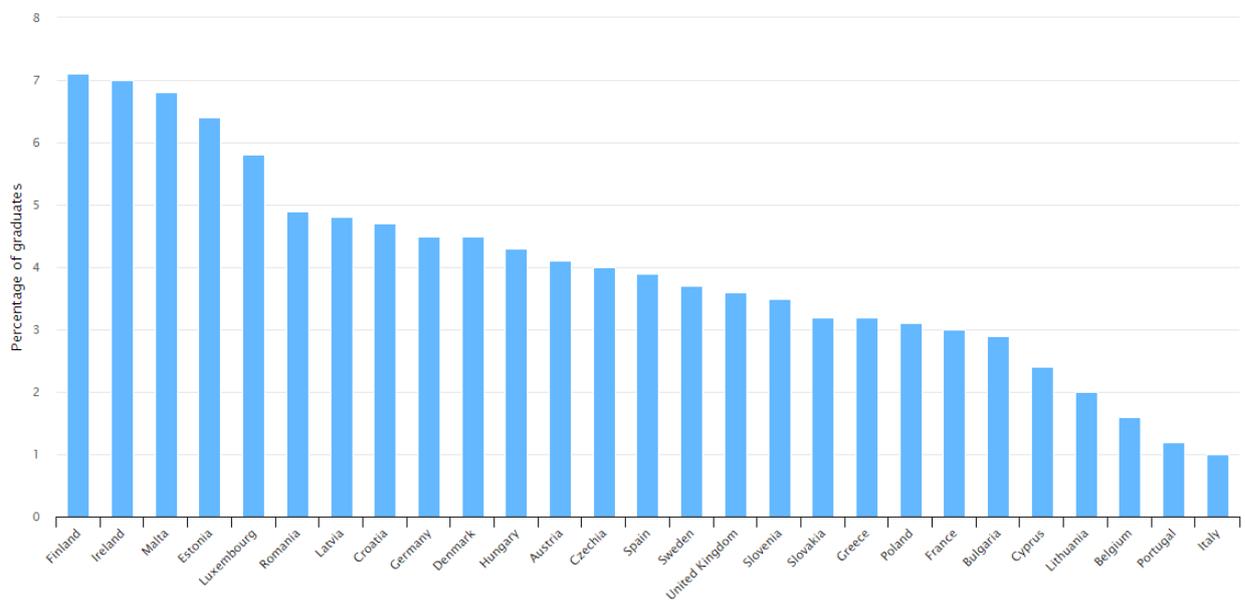
2b1 ICT Specialists



European Commission, Digital Scoreboard

Table 3⁴

2b3 ICT graduates



European Commission, Digital Scoreboard

³ Source: https://digital-agenda-data.eu/charts/desi-components#chart={%22indicator%22:%22desi_2b1_ictspec%22,%22breakdown-group%22:%22total%22,%22unit-measure%22:%22pc_ind_emp%22,%22time-period%22:%222019%22}

⁴ Source: https://digital-agenda-data.eu/charts/desi-components#chart={%22indicator%22:%22desi_2b3_ictg%22,%22breakdown-group%22:%22total%22,%22unit-measure%22:%22pc_grad%22,%22time-period%22:%222019%22}

Alongside specific professional qualifications and IT competences, more general skills and competences will also be increasingly important: communication skills, social skills, organizational skills, team work, project work, but also intercultural awareness and language skills. Soft skill jobs tend to be favoured by women, especially in marketing and social media, public relations and communications.

The most important soft skills included:

- Team Working
- Adaptability
- Empathy/ Emotional intelligence
- Critical Thinking
- Creativity, originality and initiative
- Reasoning, problem-solving and ideation/ Decision Making
- Analytical thinking and innovation
- Flexibility
- Communication
- Project and team management

Methodology

O1 Benchmarking “European Digital Professions” was focused on the analysis, expert exchanges and comparison of the digital skills and professions in the partner countries. During the realization of O1 we have used the following methodology:

1. Desk research – finding the public dates about educational process to increase the digital skills generally
2. Brainstorming of the educational experts and trainers in partner countries – best practice for obtaining the digital skills identified.
3. National reports in partner countries – desk research in partner countries – definition of the most often digital professions following the required digital skills, the original teaching methods of digital skills
4. Benchmarking comparison of the national reports and partner information

The most demanded Digital Professions

The current digital professions are focused on position with knowledge of IoT, Big Data, web design programming, design, installation and support, software development, network installation and maintenance or development of algorithms, which are important in process of digitalization. Currently, the profession in demand are Specialist in the Internet of Things, Analyst and Data scientist, Expert in data protection, Big Data scientists, Graphic designers, Digital marketing professionals, etc.

Professions most in demand in all partner countries:

- **Digital Marketing Specialist/Manager**

- Head of digital marketing department or Inbound marketing expert.
- Creating, defining and implementing digital marketing plan of the company; report of the main key performance indicators of the marketing department and transversal actions. Control of the overall digital marketing strategy and budget allocation to the associated disciplines (inbound marketing, social media marketing, SEM, email marketing, etc.). Market research, competition, target and trends for creating digital marketing strategy.

- **SEM & SEO Specialist**

- Responsible for planning, implementing and managing company's strategy.
- Define and create paid search campaigns based on keywords, conversion-oriented and goal achievement website. Improve organic search engine positioning and increase the number of site visits. Development strategy for search engine marketing campaigns payment. Monitoring and analysis of campaign data to identify opportunities for optimization. Working with sales teams and generate new accounts for search campaigns.

Area: Digital marketing

- **Data Analytics Manager**

- Manage data quality. Transform data into relevant and useful information for the company. Data management and data infrastructure. Knowledge management and knowledge bases. Leadership of data analysis plans in massive environments such as social networks, telecommunications operators, e-commerce.

- **Big Data scientists**

- Give meaning and significance to the data collected in the big data integration projects of a company. Programming, capturing data in ingenious ways, the ability to look at things differently, and the activity of cleansing, preparing and aligning the data.

Area: Business data, Analytics

- **Content Marketing Manager/ Content Manager**

- Responsible for digital content.
- Creation, definition and implementation of those aspects linked to the organization generate content for your website, blogs, social networks or any other both their own and foreign support. Create, develop and manage content depending on the goals and objectives of the company.

- **Social Media Specialist/Manager**

- Responsible for social media strategy.
- Creation, development and implementation of social media strategy, both in terms of branding as well as products and services. Create and develop online social identity of the organization in order to give the brand, company and products "personality" online. Designing and writing different communication, management, and crisis protocols. Coordinate the team of community managers.

Area: Communication, Social media, Marketing

- **Head of e-Commerce/e-Commerce Manager**

- Prepare and lead the digital strategy adapted to the type of e-commerce, product type and scope territory. Manage and innovate in the key areas: online store, products, digital marketing, payment systems, fulfillment, logistics, customer service, analytics. Directing internal and external teams working on different digital areas (content, social media, SEO, SEM, CRM).

Area: Digital business

The most demanded Digital skills

Advanced digital skills will be critical for digitizing the economy all over countries in Europe. All employees will need to develop basic digital skills, as workers will be required to use online applications or other technological tools. However, more often the need for advanced digital skills is required.

Skills most in demand in all partner countries:

- Advanced Cyberinfrastructure
 - including all areas of computing scientific research
- Computing and Communication Foundations
- Computer and network systems
 - including big data, cloud computing and IoT
- Information and intelligent systems
 - including the artificial intelligence, human-centred computing
- Knowledge of technologies and programming languages
 - SQL/PLSQL; HTML/CSS; Java C++/Visual C++; Microsoft-related technologies; Microsoft SQL Server
- Knowledge of code development (programming)
- Database tools
- Software development
- Network installation/ maintenance
- System security
- Web and Graphic Design
- Understanding of marketing concepts

European Digital Professions Competence Framework

O1 was focused on the definition of digital profession, digital skills and also for the definition of Trainer and Trainee Digital Professions Competences and the most suitable Learning/Teaching methods.

The Trainer Digital Professions Competences

Training is not about the exchange of knowledge, money or titles. The Digital professions Trainers must be leaders capable of transforming lives, it's that simple. More than a “professor”, they should be a Digital Professions Trainer and facilitator. This Digital Professions Trainer must face the learning process as a project which leads the students to a worthwhile apprenticeship by themselves. New technologies/digital skills are not about masterclasses but about learning paths.

The Digital Professions Trainer should have the following skills:

- **Occupation specific skills (appropriate IT skills)** - specific skills involved in a particular IT profession and therein meet professional standards
- **Methodological skills** - to organize training, decide on the sequence, plan and execute it, monitor progress of Digital Professions Trainees, evaluate skills and knowledge and correct mistakes. The Digital professions Digital Professions Trainer may even have to deliver short presentations at times and make use of visual aids for better understanding
- **Social skills** - communicating with and relating to others. He/she has to be able to explain, to encourage, criticize, motivate and praise. Without communication skills and the ability to handle different kinds of people, professional expertise, e.g. as a welder, is hardly of any use when it comes to training

The Trainee Digital Professions Competences

Each Digital professions Trainee is different. While some can easily assimilate some subject matters, they encounter difficulties in other areas. Digital professions Trainer has to consider the individual traits and characteristics which differentiate each Digital Professions Trainee and cause each to react in his/her own peculiar way. Digital professions Trainer also has to adapt the

training to the background of the respective Digital professions Trainees. This means being considerate of the level of knowledge they have, whether they are slow learners or fast learners and how they learn best. To recognize the different needs of different people in a training context is a crucial requirement for a Digital professions Trainer since it is his/her responsibility to facilitate learning for all Digital professions Trainees.

The differences between learners depend on a wide variety of factors, one of them being age: in general, the ability to learn increases rapidly from early childhood to the early twenties, after which it declines very slowly up to about the age of 45. Somewhere around 55, a steeper decline begins. While manipulative skills are usually learned faster by the younger ones, middle-aged people can be more adept at learning due to their better background of knowledge and experience. Despite of age, continuous learning has become a necessity today because of the constant and rapid changes in procedures, processes, etc.

The original and new learning/teaching methods

All countries are used to focused on traditional classroom sessions, e-learning, blended learning, mobile applications, etc. Not so traditional, but also often used are webinars and virtual classrooms.

The innovative IT training methods:

Gamification exploits how games can capture student interest while having a serious goal, such as promoting self-regulation and the capabilities to handle complexity and the unknown. These pedagogies build on games features, such as rapid feedback, badges and goals, participation and progressive challenge.

Chatbots or artificially intelligent conversational tools, developed to improve student interaction and collaboration, are acting as a game changer in the innovative EdTech world.

Computational thinking encourages problem-solving by looking at challenges in the same way as computers and then using technology to resolve them. Its basic elements include logical reasoning, decomposition, algorithms, abstraction, and pattern identification—using techniques

such as approximate solutions, parallel processing, model checking, debugging, and search strategies.

Experiential learning occurs through active experience, inquiry, and reflection. Its four main components are 1) concrete experience that potentially builds upon existing understanding, 2) reflective observation, 3) conceptualization, and 4) practical experimentation.

Embodied learning looks beyond information acquisition and the purely intellectual by intending to connect via the physical, artistic, emotional, and social. Embodied pedagogies promote knowledge acquisition through the natural tendencies of the young through creativity and expression, and promote the development of curiosity, sensitivity, risk-taking, and thinking in metaphors and multiple perspectives.

Investive class room or flipped classroom: this is an instructional strategy and a type of blended learning that delivers instructional content often online and outside the classroom. It moves activities, including those that may have traditionally been considered homework into the classroom. Therefore, class time is dedicated to discussion. In a flipped classroom, students watch online lectures, collaborate in online discussions or carry out research at home while engaging in concepts in the classroom with the guidance of a mentor.

Conclusions

Difference among the population

- Lack of basic and also advanced digital skills and the least involvement in the digitization process is in older age group (over 45s).
- Professionals aged under 45 are more open to acquire digital skills, this aged group represent the majority of people taking training.

In the future, it will be expected the need for promoting life-long learning among the citizens, strengthen skills needed to increase the use of the Internet - to invest in the qualification of the young population and to requalify human resources

Difference in gender

- A problem in the under-representation of women in digital professions or in the access and use of ICTs in many European countries.
- There is a growing gap between men and women's participation in the digital professions. However, it should be noted that this is not the common situation in all countries – in Spain gender is not a particularly significant difference in representation of digital professions.

It is important to coordinate measures and actions in education and employment and develop gender inclusive digital programmes to increase digital competences for different groups of people.

Lack of staff in ICT sector

High-skilled, technical professions struggle with lack of appropriate staff in ICT sector. The big issue is lack of staff particularly with knowledge of programming. Many countries have improved their performance on digital competencies. The growth of countries cannot be achieved without the transformation of economy from the traditional manufacturing and trade to a modern model focused on Digital Technologies, improving competitiveness, and adopting

innovation. For example, in the Czech Republic, labour in manufacturing and trade still represent almost half of the labour population.