

# ICT technicians: skills opportunities and challenges (2016)

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## Summary

Information and Communications Technicians (ICT technicians) support the design, development, installation, operation, testing, and problem solving of hardware and software.

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## Key facts:

- Information and Communications Technicians (ICT technicians) support the design, development, installation, operation, testing, and problem solving of hardware and software.
- In 2005-2015 employment in ICT occupations (ICT technicians and ICT professionals) grew by about 23%, with ICT technicians contributing by around 8%.
- A lack of ICT technicians concerns twelve EU Member States whereas no EU country reports a surplus in this occupation.
- Comparing 2015 to 2025, the financial and insurance sector (business services) will employ about 70% more ICT technicians.
- ICT technicians may differ according to the sector they work for. Despite these dissimilarities, common drivers of change can be identified in relation to development of new business models and processes both in IT and its user sectors.
- Another key characteristic of the occupation is that skills are particularly vulnerable to the swift and constant technological advancements across sectors.
- The five key skills required for ICT technicians are advanced ICT skills, problem solving, job-specific skills, learning and moderate ICT skills.

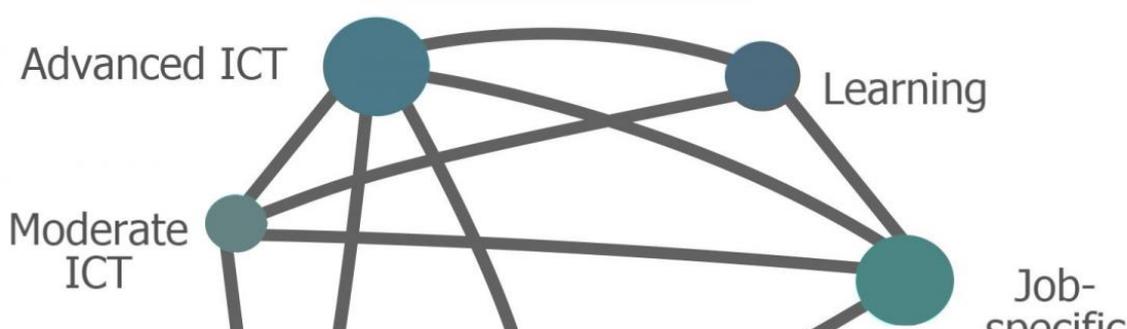
## Who are they?

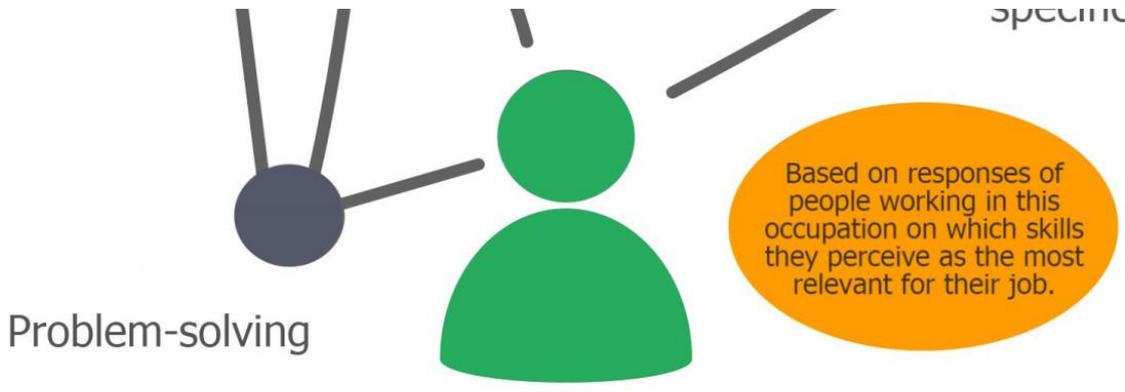
Information and Communications Technicians (ICT technicians) support the design, development, installation, operation, testing, and problem solving of hardware and software. They regard a wide set of sub-occupations that range from network system technicians to telecommunications engineering technicians. Due to the wide penetration of information technologies (IT) across the economy, they work in a wide range of sectors, from IT to manufacturing and telecommunications and number of other service sectors.

## What skills do they need?

According to [Cedefop's European skills and jobs survey \(ESJS\)](#) the key 5 skills for ICT technicians are **advanced ICT skills, problem solving, job-specific skills, learning** and **moderate ICT skills**. These skills could support employees in this occupation to also tackle anticipated future skill challenges (see drivers of change below).

**Figure 1: Most important skills required for ICT technicians**



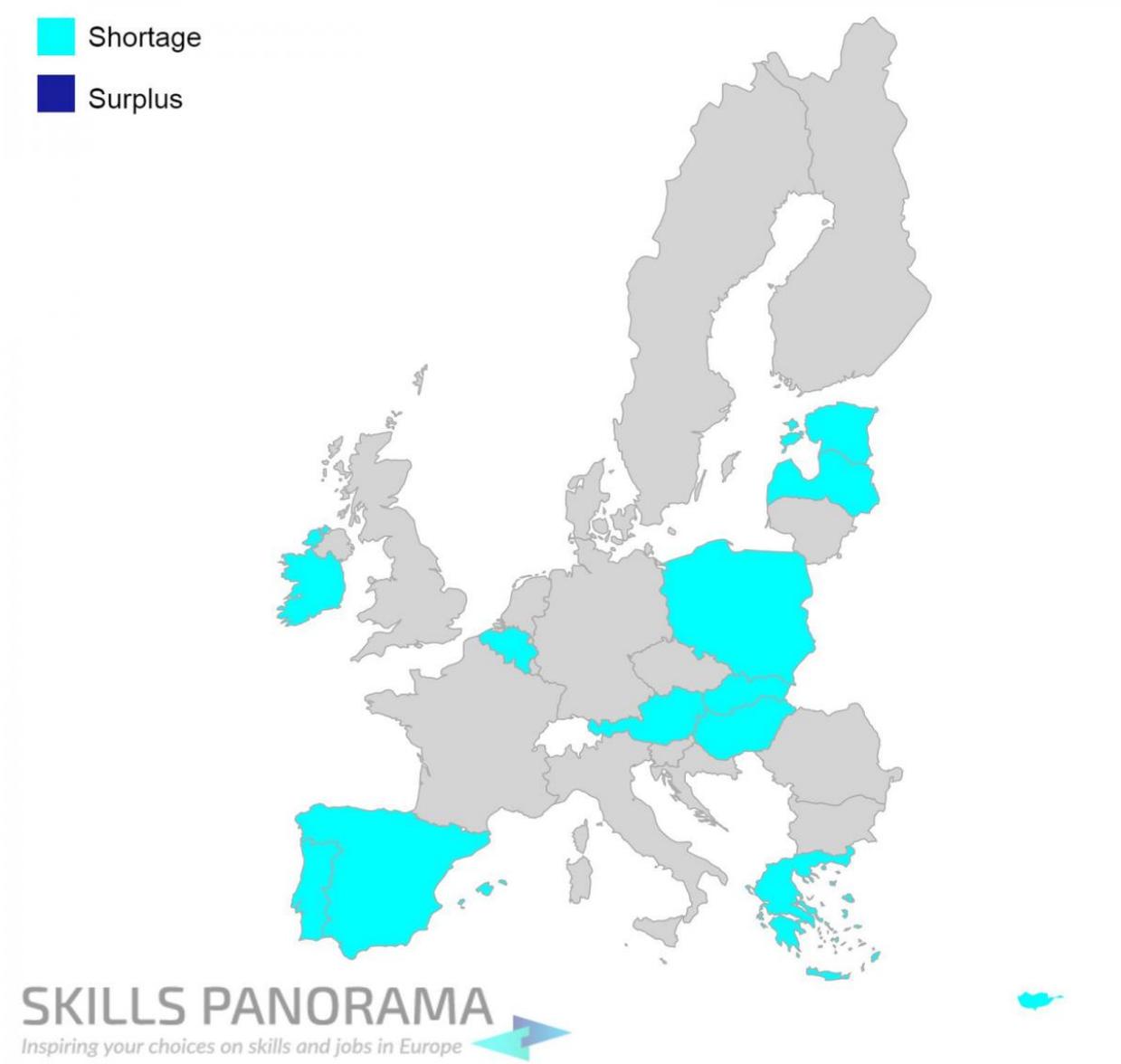


From Cedefop's European skills and jobs survey

**Where are they mostly in demand?**

The labour market dynamics for this occupation differ across EU Member States:

**Figure 2: Shortages and surpluses for ICT technicians across the EU**



According to [Cedefop](#), a lack ICT technicians concerns almost half of EU member states, including Belgium, Estonia, Ireland, Greece, Spain, Cyprus, Latvia, Hungary, Austria, Poland, Portugal and Slovakia; whereas no EU country reports a [surplus](#) in this occupation.

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## What are the trends for the future? <sup>ii</sup>

In 2005–2015 employment in ICT occupations (ICT technicians and ICT professionals) grew by about 23%, with ICT technicians contributing by around 8%. In 2015–2025, employment for ICT technicians is projected to increase by 5%, mostly driven by “replacement demand<sup>iii</sup>”. Among total job openings in the ICT occupations between 2015 and 2025, 1 in 5 is projected to be for ICT technicians, while their share within ICT occupations is mildly declining.

Technology advancements and ever-augmenting permeability of IT in production and collaboration processes are expected to significantly boost the share of high qualified employees in the occupation. In 2025, half of ICT technicians will hold high qualifications (about 40% in 2015), while the reverse trend is foreseen for medium-level qualifications.

The need for higher and more specialised qualifications and skills may draw more employment growth to ICT professionals, but technicians are expected to have surmounting role in some non-IT and telecommunications sectors: comparing 2015 to 2025, the [financial and insurance sector \(business services\)](#) will employ about 70% more ICT technicians. Significant employment growth is also foreseen in other business services ([media](#); about 20% increase), as well as in industries in [manufacturing \(food, drink and tobacco \(ca. 30% increase\) and motor vehicles \(ca. 20%\); distribution & transport \(accommodation and catering by roughly 40%\); wholesale and retail trade, ca. 35% increase\), non-marketed services \[education and health \(almost 30% and 20% increase\)\]](#).

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## Which drivers of change will affect their skills?

Given the wide range of industries that ICT technicians can be employed in, they need to combine technical skills with sector-relevant skills as well as understanding of objectives and challenges of that particular sector. Subsequently, sector-specific skills are influenced by factors not necessarily related to IT.

ICT technicians may differ according to the sector they work for. Despite these dissimilarities, common drivers of change can be identified in relation to development of new business models and processes both in IT and its user sectors. These drivers are foreseen to affect the demand for and skills of ICT technicians:

- **Mobile internet technologies and adoption of business models of ICT provisions** such as software-as-a-service, web-based services and downloadable applications will generally decrease demand for [system operators<sup>iv</sup>](#). As the provision of these services is centralised and applied remotely, on-site

customer service<sup>v</sup>. As the provision of these services is centralised and applied remotely, on-site technical support becomes less pertinent, but not obsolete: mobility (of employees, consumers, devices and applications) asks for the support and smooth interference of different software versions, operating systems and security arrangements<sup>v</sup> which can be safeguarded by an ICT technician.

- Increased **user friendliness** of web applications/ management systems and software empowers non-expert users to function autonomously, while the level of user ICT skills also rises. Although “traditional” customer support may change in nature as a consequence, the increased share of older employees and customers with less advanced e-skills calls for ICT technical support.
- Explosive increase in the development of overall **technological, online and mobile activities** (for example, e-sales) asks for ICT technicians’ support of Internet, networks and relevant infrastructure.
- With the growing **utilisation of mobile and web-based solutions**, the ability to manage more complex partner and supplier relationships becomes more important. Technicians may be less needed for their technical skills but as they will become more client-facing, they will be exposed to a growing need for business and interpersonal skills and the ability to communicate technical as well as non-technical information verbally and in writing<sup>vi</sup>.
- **Automation and digitalisation** infiltrates all sectors, even non-ICT intensive ones (such as health, education, accommodation and catering), creating further demand for ICT maintenance and support services.
- The need for **stronger cyber security** is also impacting on technicians’ skills<sup>vii</sup>. There is a need to continuously update and improve security skills related to the entire range of products and services that information and communications technicians deal with, from adjusting software that delivers tighter security to technical support to ensure the on-going protection of systems. This requires skills to develop integrated security solutions and manage risk, based on a solid understanding of the vulnerabilities of underlying ICT system architecture<sup>viii</sup>.
- **System integration** - the process of linking together different computing systems and applications to act as a coordinated one- is still a major ICT trend. The demand for ICT technical skills to manage complex IT environments and systems can therefore be expected to increase.
- Technological advancements such as **cloud computing, the Internet of Things** and **advances in computer power and Big Data** are expected to substantially alter the way the economy and society function. ICT technicians can be expected to have a role in supporting the well-functioning of the advanced computer systems and networks.

“As perhaps the biggest disruptive technology trend in recent times, **cloud computing** is steadily permeating throughout businesses across the world. As IT infrastructure and operations are moved to off-site hosted locations, there will be inevitable reverberations in the job market. It means that new and updated skillsets will be required, while others will have to adapt and be redeployed. As the uptake of Infrastructure-as-a-Service increases, in-house infrastructure related jobs such as system administrators or operators may find that their primary tasks will be moved to the cloud. This means that fewer traditional data centre managers will be needed internally as IT becomes hosted offsite by someone else.”

Source: [Computerweekly.com](http://Computerweekly.com)

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## How can these skill needs be met?

The expected increase in the demand for high qualifications opens opportunities for education and training providers. Pertinent to ICT occupations overall, the challenge lies in proper design of curricula or work-based learning training to ensure the balance between specific ICT skills that will probably be obsolete by the learners' graduation; and overly general skills that hinder employability.

Employers need to be able to provide learning opportunities covering the entire range of learning outcomes connected to a holistic qualification. This might be difficult for small companies offering a limited portfolio of services, or in sectors where a company offers one specific solution (as often in the ICT sector).

Another key characteristic of the occupation is that skills are particularly vulnerable to the swift and constant technological advancements across sectors. At the same time, ICT occupations draw significant number of individuals with non-ICT background. High quality continuous vocational education and training is therefore necessary to ensure that ICT technicians stay abreast of technological advancements, regardless of the sector/industry they work for.

Certification<sup>x</sup> and reskilling programmes are necessary to ensure that current and future ICT technicians are well-equipped to handle these skill challenges. Moreover, as employment demand outpaces supply in ICT occupations due to fast technology developments, recognition and validation of non-formal and informal learning can be a significant component of bridging skill shortages.

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## References

[i] Defined as ILO ISCO 08 group 35 ICT Technicians occupations. ILO (2012) [International Standard Classification of Occupations ISCO-08](#). More information on the occupation can be found [here](#).

[ii] Cedefop 2016 forecast

[iii] The need to replace workers leaving a profession for various reasons, such as retirement. For more information on replacement demand and how it drives employment across sectors, can be found on the Skills Panorama [here](#).

[iv] World Economic Forum 2016, "[The Future of Jobs](#)".

[v] IDC/European Commission 2014, [ICT TRENDS 2020 Main Trends for Information and Communication Technologies \(ICT\) and their Implications for e-LEADERSHIP SKILLS](#).

[vi] ILO Commission for Employment and Skills 2012 [Information and Communication Technologies](#).

European Commission for Employment and Skills 2012, *Information and Communication Technologies Sector Skills Assessment 2012*.

<sup>[vii]</sup> World Economic Forum 2012, "*Global Risks 2012*",

<sup>[viii]</sup> IDC/European Commission 2014, *ICT TRENDS 2020 Main Trends for Information and Communication Technologies (ICT) and their Implications for e-LEADERSHIP SKILLS*.

<sup>[ix]</sup> Accessed May 2016.

<sup>[x]</sup> [Towards a European Quality label for ICT industry training and certification](#), viewed 1 June 2016.

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