



EUROPEAN SEMESTER THEMATIC FICHE

DIGITAL SINGLE MARKET: DIGITAL SKILLS AND JOBS

Thematic fiches are supporting background documents prepared by the services of the Commission in the context of the European Semester of economic policy coordination. They do not necessarily represent the official position of the Institution.

1 Introduction

Digital technologies have spread throughout all sectors of the economy and now play a key role in most business processes. However, reaping their full potential gains for growth and jobs is hindered by the lack of a Digital Single Market in Europe. The creation of a Digital Single Market in the EU (DSM) holds enormous potential for the economy and it has been estimated that the achievement of a fully functioning DSM will contribute EUR 415bn to GDP per year and create hundreds of thousands of new jobs, while fostering better services and offering more choice for citizens. The DSM can enable SMEs including start-ups to reach out to a market of over 500 million people and to transform traditional industries.

The Digital Single Market strategy sets out a comprehensive strategy to address the barriers to a fully functioning DSM, including: improving infrastructure (networks, connectivity), ensuring the appropriate level of digital skills, overcoming regulatory fragmentation, harnessing the potential of eGovernment, and boosting trust in the Internet as a sales channel and awareness of rights and obligations online.

The Digital Economy and Society Index (DESI) 2016¹ is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU Member States in the Digital Single Market. The index includes five main dimensions: Connectivity, Human Capital, Use of Internet, Integration of Digital Technology, and Digital Public Services. The current fiche deals with the Human Capital dimension or, in other words, digital skills and jobs (see fiche on Skills for the Labour market for other labour market skills needs).²

Rapid innovation in ICT and its adoption throughout the economy is having a massive impact on the jobs available and skills needed in the economy. Firstly, it is changing the structure of employment; leading to the automation of "routine" tasks, generally requiring medium levels of skill, while at the same time leading to the creation of new jobs involving largely non-routine tasks, both requiring high and lower skills. Secondly, it is leading to the need for

¹ <http://ec.europa.eu/digital-agenda/en/digital-economy-and-society-index-desi>

² For the other DESI dimensions see the thematic fiches on Quality of public administration, Broadband and Use of Internet by citizens and companies.

increased numbers of skilled ICT professionals in all sectors of the economy. Thirdly, it is leading to the need for digital skills for nearly all jobs where ICT complements existing tasks. Fourthly, it is leading to the need for everyone in society to have basic digital skills in order to live, work, learn and participate in an increasingly digital society. All of these changes are resulting in a mismatch between the current skills available in the economy and those that are being increasingly demanded.

The number of ICT professionals (e.g. those who develop and maintain ICT applications) - in the ICT sector as well as in the rest of the economy - has grown by about 4 per cent per year over the last decade. If this trend of demand for ICT professionals continues, there will be more than 700 000 unfilled vacancies for ICT professionals in the EU by 2020.

But the issue is not only related to ICT professionals. In 2015, 16% of EU citizens had never used the internet. Yet digital skills are increasingly needed throughout the economy and society for work, leisure, learning and participation. They are key competences; as important today for modern economies and their citizens as reading and writing.

In terms of work, digital skills are needed for implementing innovations and modern business practices, without which there can be no growth or increased employment effect from ICT. Digital skills are important for employability of a person. Most jobs require some kind of computer related knowledge. Indeed, while ICT professionals account for 3.7% of EU employment (2014), 49% of employed persons in the EU (2015) use a computer connected to the internet in their jobs. Across the EU, the figure varies, from 25% in Bulgaria over 70% in Sweden, Finland and Denmark.

Moreover, digital skills are increasingly important in enabling European consumers to fully play their role in the Digital Single Market. E-commerce brings substantial gains to consumers, mainly through increased choice and better prices. Internet use positively correlates with consumer conditions, as evidenced by the Commission's Consumer Conditions Scoreboards and Consumer Markets Scoreboards. For instance, Internet users score higher on indicators linked to consumer trust, empowerment (switching services, complaining in case of problems) and knowledge of consumer rights³.

2 Identification of the challenges

The challenges related to low digital skills fall into three distinct areas. The first area relates to the general availability of digital skills in the population. The relevant indicator used to assess the area is the share of citizens with no/low digital skills.

The second area focuses on the labour force and the general use of ICT. The relevant indicator in this area is the share of the workforce with no/low digital skills.

The third area is related to ICT professionals. There are two relevant indicators related to this area: (1) the share of ICT professionals in the workforce, and (2) the share of enterprises reporting hard-to-fill vacancies for ICT specialists.

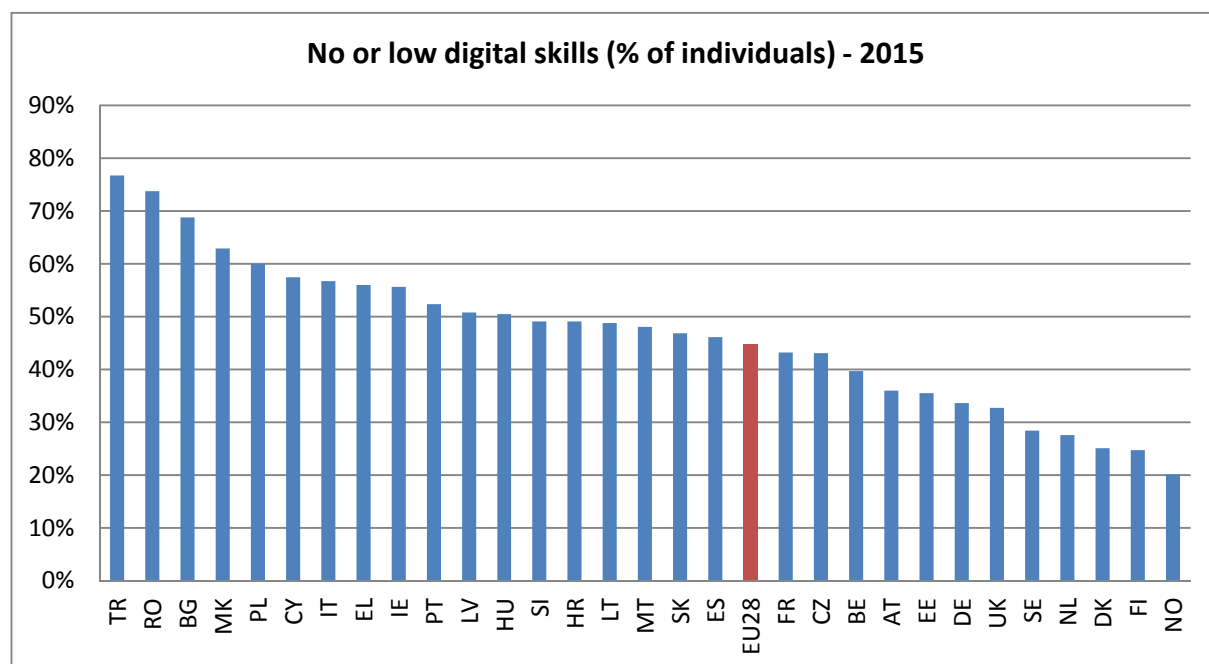
³ http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/10_edition/index_en.htm

2.1 Digital skills of citizens

A large share of citizens with no or low digital skills delays the adoption of ICT across the economy, in the public and in the private sectors, thus slowing down increases in productivity, competitiveness and GDP growth. It also means that those people without such skills are increasingly excluded from modern life and the opportunities that digital services can offer.

In the EU, 45% of citizens have no or low digital skills. Whereas less than 30% of citizens have no or low digital skills in 5 countries (SE, NL, DK, FI and LU), the corresponding rates are above 50% in 9 countries (RO, BG, PL, CY, IT, EL, IE, PT, LV (see Figure 1).

Figure 1: Percentage of the EU population with No or Low Digital Skills



Source: Eurostat

An OECD survey from 2013⁴ (PIAAC) showed that 13% of citizens in the EU (EU17⁵), either lack any computer experience at all or had such low levels of ability that they failed to take a computer based problem solving test. Across Member States this ranges from less than 10% (DK, NL, FI, SE) to more than 20% (ES, CY, IT, PL, SK). Furthermore, only 43% of citizens across EU13⁶ showed only basic⁷ levels of proficiency and 34% showed good levels of proficiency. At the top end in three countries (NL, FI, SE) more than 40% showed good proficiency.

⁴ OECD (2013), OECD Skills Outlook 2013: First Results from the Survey of Adult Skills, OECD Publishing. <http://dx.doi.org/10.1787/9789264204256-en>

⁵ Reported as "EU17": Austria, Belgium (Flanders), Cyprus, Czech Republic, Denmark, Estonia, United Kingdom (England/Northern Ireland – 87% of the UK working age population), Finland, France, Germany, Ireland, Italy, Netherlands, Poland, Slovak Republic, Spain, Sweden.

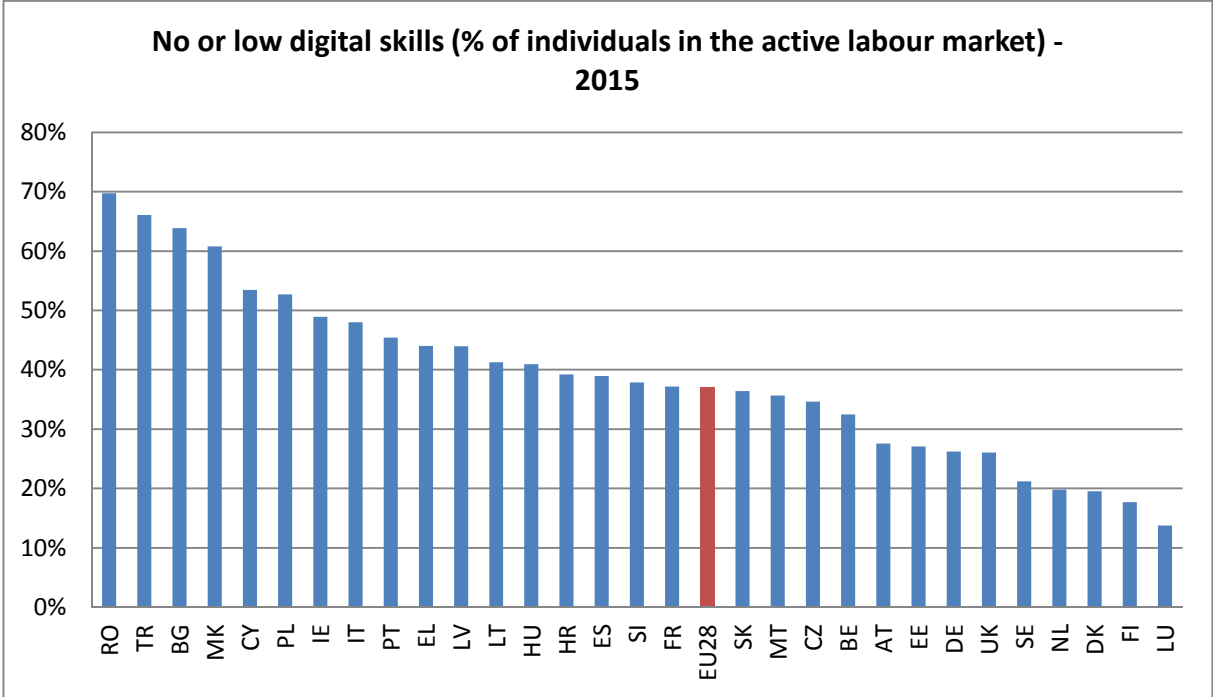
⁶ The test was not carried out in Spain, France, Cyprus and Italy

⁷ Tasks typically required the use of widely available and familiar technology applications, such as e-mail software or a web browser. The tasks involve few steps and a minimal number of operators. At the cognitive level, the respondent can readily infer the goal from the task statement; problem resolution requires the respondent to apply explicit criteria; and there are few monitoring demands. Only simple forms of reasoning, such as assigning items to categories, are required; there is no need to contrast or integrate information.

2.2 Digital skills in the labour force

Around 90% of jobs are estimated to need at least some level of digital skills in the EU. Acquiring those skills is thus becoming a precondition for workers to become and remain employable. On average in the EU 37% of the labour force have no or only low levels of digital skills – meaning that they can do little more than carry out a limited number of simple tasks such as sending an email. However, the figures range substantially across EU countries. While in the most digitally advanced Member States such as Luxemburg it is around 14%, in 11 countries (RO, BG, CY, PL, IE, IT, PT, EL, LV, LT, and HU) it is above 40%. In Bulgaria and Romania it is around 2/3 of the labour force (see Figure 2).

Figure 2: The share of the labour force with no or low digital skills

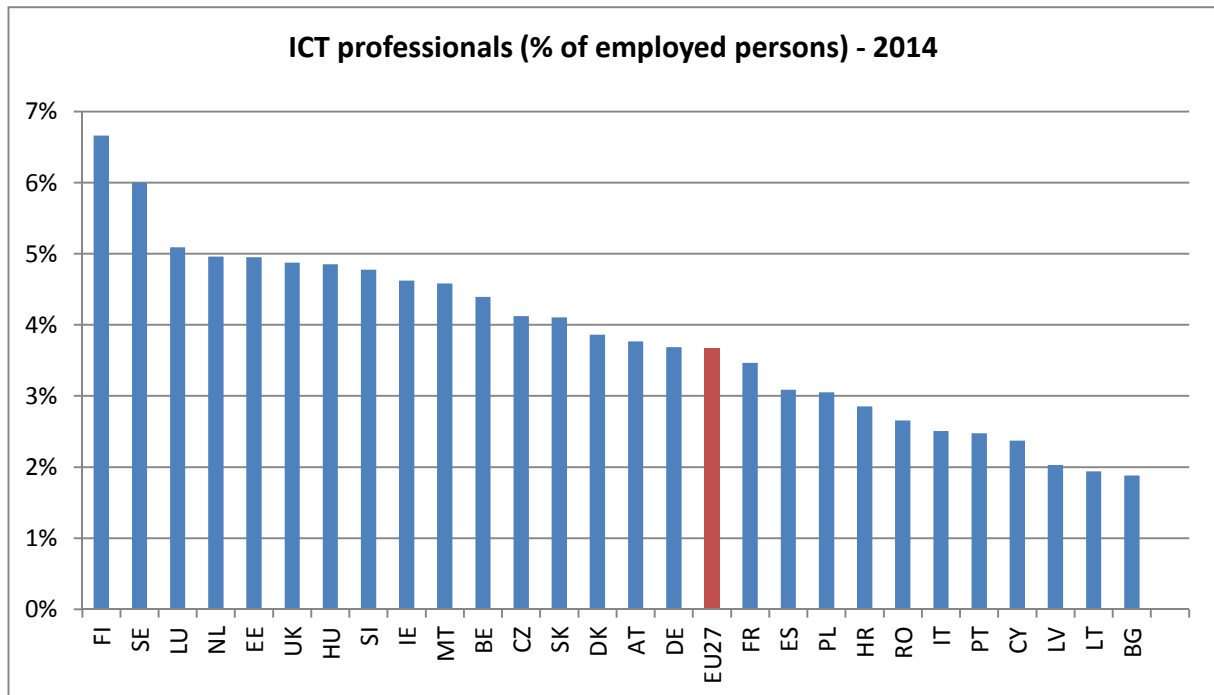


Source: Eurostat

2.3 Lacking ICT professional skills

Having enough adequately skilled ICT professionals in an economy is key to achieving the potential gains from the digital economy for growth and employment. The share of ICT professionals out of all employed persons is important for the development of high technology industries. ICT jobs are not evenly spread across EU countries and country differences are considerable, with shares ranging from 1.8% to 6.7% (see Figure 3).

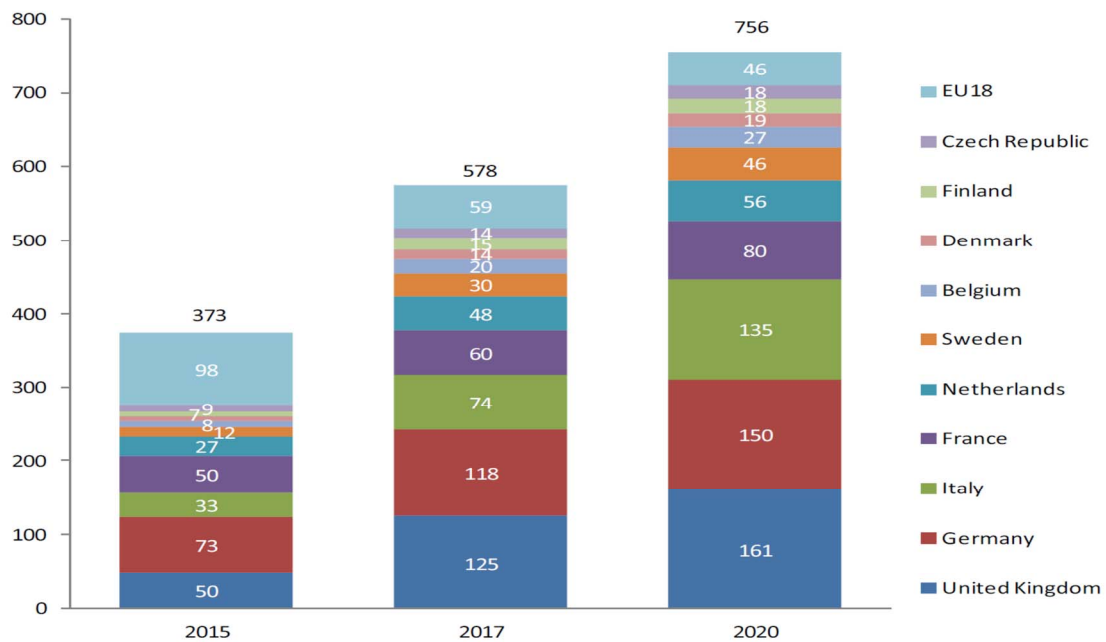
Figure 3: The share of ICT professionals in the EU and its Member States



Source: Eurostat

Evidence suggests that there is a growing lack of ICT professionals in Europe that could reach more than 700,000 unfilled vacancies by 2020. The largest gap between demand for and supply of ICT professionals can be found in Germany, the United Kingdom and France. Forecasts suggest that gaps in these countries will grow and that gaps will emerge in Italy, the Netherlands and Sweden (see Figure 4).

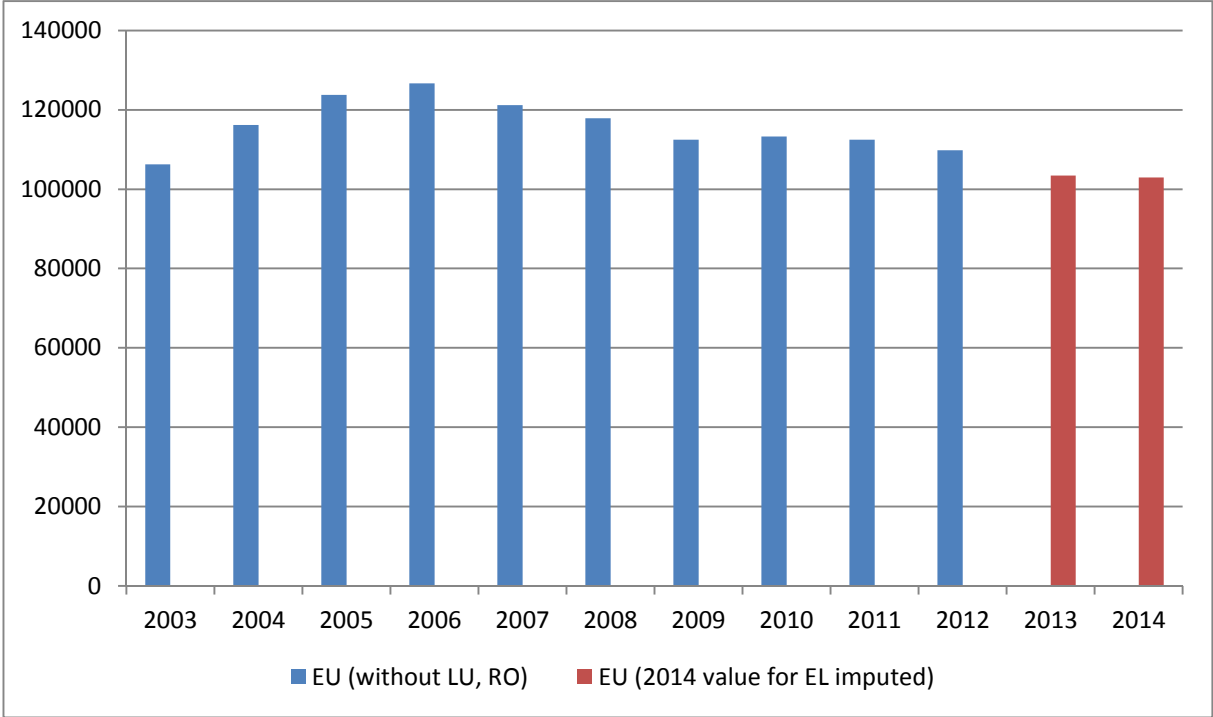
Figure 4: Vacancies for ICT professionals in the EU – main forecast 2012-2020



Source: Empirica (November 2015)

The decline in the number of ICT graduates over the past decade contributes to this situation. The number of ICT graduates in the EU increased until 2006, but has decreased since then (from 129,000 in 2006 to 103,000 in 2014) despite good prospects and above average wages for ICT professions. The most dramatic decreases can be observed in the UK, Spain, Romania and Ireland (see Figure 5).

Figure 5: First degrees in computing in the EU

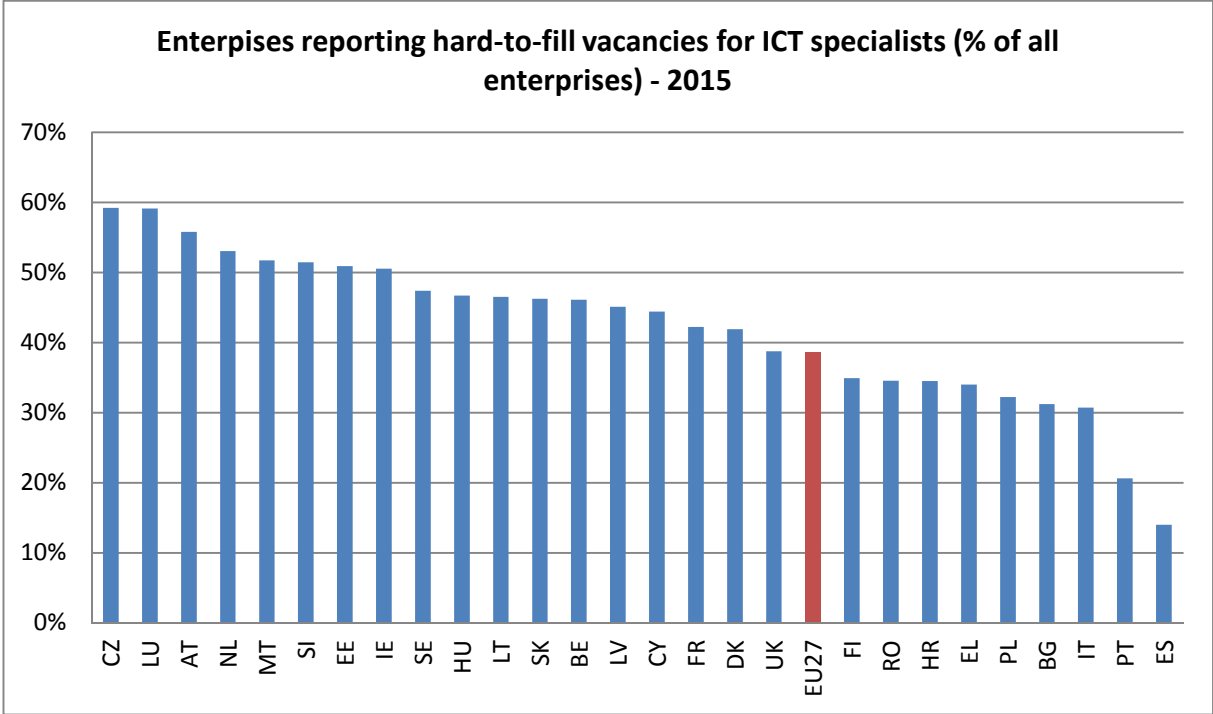


Source: Eurostat

Not all ICT professions are equally demanded and the ICT workforce is currently undergoing significant structural change, resulting also in the need for retraining the ICT workforce in the new skills being demanded. The type of ICT professional skills in demand are predominantly in the core ICT competency areas (software, web and multimedia developers and test specialists; hardware and network specialists and systems administrators; database designers and administrators).

Across the EU, enterprises are increasingly finding it difficult to fill their vacancies for ICT specialists. On average in the EU 39% of enterprises report difficulties in hiring skilled ICT professionals. There are however large differences between the various countries. While in Spain only around 14% of firms experience difficulties getting the skilled ICT staff they need, for the Czech Republic and Luxemburg it is round 60% (see Figure 6).

Figure 6: Share of enterprises in the EU and Member States reporting hard-to-fill vacancies for ICT specialist



Source: Eurostat

The share of enterprises reporting difficulties in hiring ICT professionals is an important indicator of the availability of appropriately skilled ICT professionals in the economy. This data is positively correlated with figures on demand for ICT specialists and with forecasts of emerging skills gaps in a number of countries.

3 Identification of appropriate policy levers to address the identified challenge

To address the digital skills deficit the Commission launched in March 2013 the Grand Coalition for Digital Jobs, i.e. a large collaborative effort aimed at offering more ICT training, implementing job placement programmes, providing more aligned degrees and curricula at vocational schools and universities, and motivating young people to study ICT and pursue related careers.

The initiative has received over 60 pledges by around 100 stakeholders. 13 national coalitions have been created, reflecting the priorities and actions of the Grand Coalition at local level (BE, BG, CY, EL, IT, LV, LT, MT, NL, PL, PT, RO, UK) and more are in the pipeline (HU, ES, AT, DE).

Skills development, however, does not come about as fast as technological development. Digital technologies are spreading to all sectors of the economy and some level of digital skills or competences is required by most jobs.

National coalitions for digital skills and jobs should be established in all Member States and need to be more explicitly supported at a high political level (Ministerial) to become sustainable and have impact, for example by implementing national digital skills strategies.

The Grand Coalition should be scaled up to include ICT-using companies (e.g. banking, automotive, healthcare, energy, textiles, tourism) and other pertinent stakeholders (e.g. education and training providers, social partners).

In the context of the New Skills Agenda the European Commission will present a set of initiatives to tackle skills gaps and minimise skills mismatches across economic sectors Europe. The lack of digital skills will also be addressed.

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