



# Human Capital Digital Inclusion and Skills

Digital Economy and Society Index Report 2019  
Human capital

**The Digital Economy and Society Index (DESI)** is a composite index that summarises relevant indicators on Europe’s digital performance and tracks the progress of EU Member States in digital competitiveness.

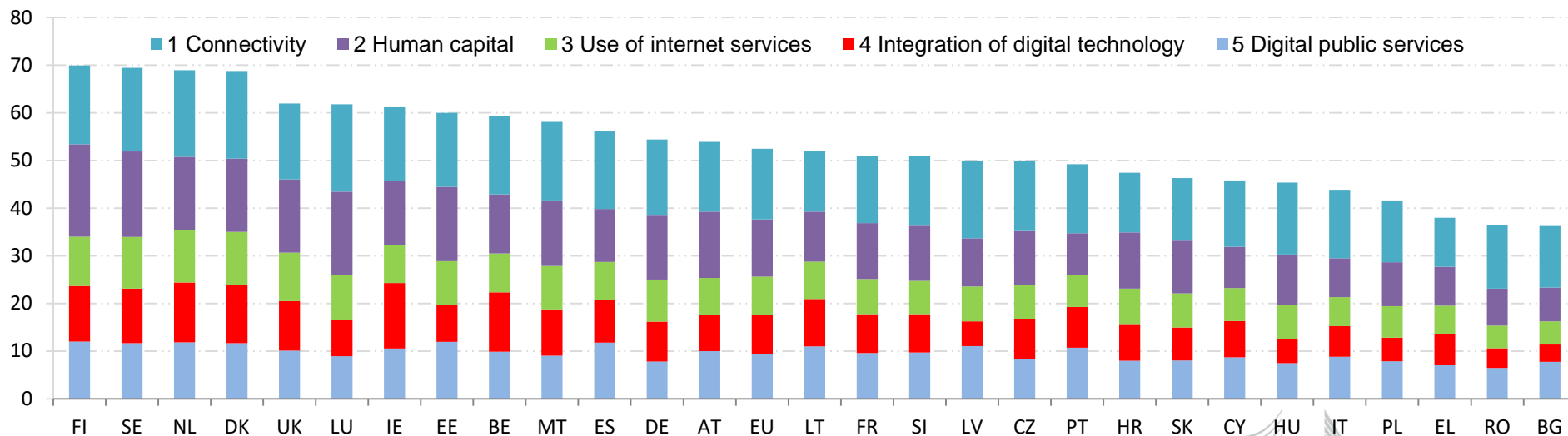
Finland, Sweden, the Netherlands and Denmark, have the most advanced digital economies in the EU followed by the UK, Luxembourg, Ireland and Estonia.

Bulgaria, Romania, Greece and Poland have the lowest scores on the index.

### The five dimensions of the DESI

1 Connectivity	Fixed broadband, mobile broadband, fast and ultrafast broadband and prices
2 Human capital	Internet user skills and advanced skills
3 Use of internet	Citizens' use of internet services and online transactions
4 Integration of digital technology	Business digitisation and e-commerce
5 Digital public services	e-Government and e-health

**Digital Economy and Society Index (DESI) 2019**



Source: DESI 2019, European Commission



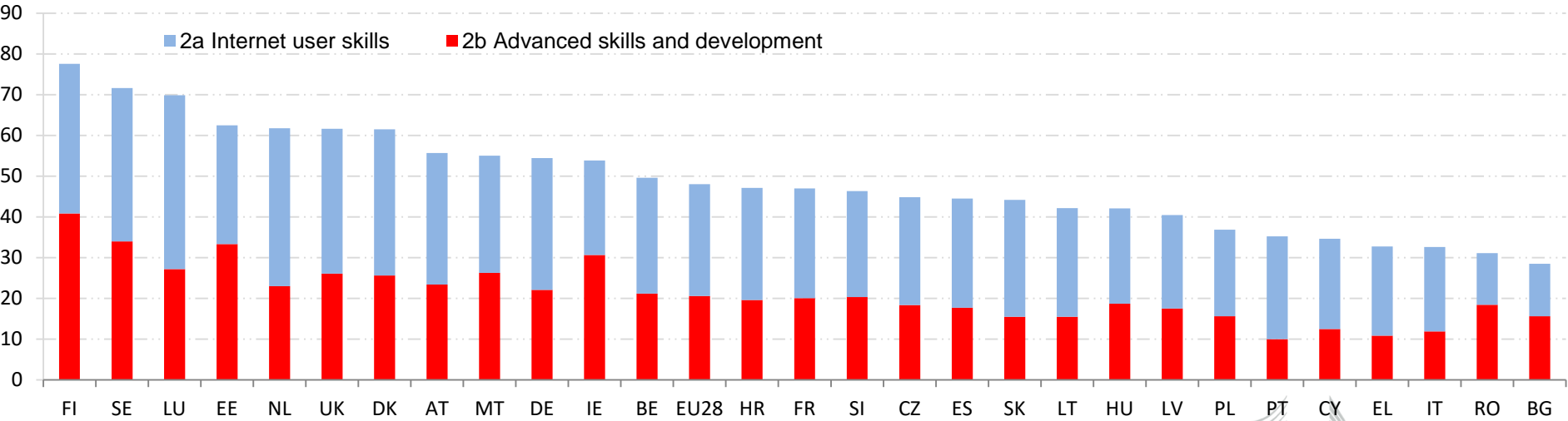
In the **Human capital dimension of DESI 2019**, Finland, Sweden, Luxembourg and Estonia obtained the highest scores. Bulgaria, Romania, Italy and Greece had the lowest ones.

The Human capital dimension of DESI has two sub-dimensions covering 'internet user skills' and 'advanced skills and development'. The former draws on the European Commission's Digital Skills Indicator, which is computed based on the number and complexity of activities involving the use of digital devices and/or the internet. The latter includes indicators on ICT specialist employment and ICT graduates. According to the latest data, Luxembourg, the Netherlands and Sweden are the top performers in terms of internet user skills, whereas Finland, Sweden and Estonia have the highest scores in advanced skills and development. Bulgaria, Romania, Italy and Greece rank the lowest overall on DESI's Human Capital dimension.

Human Capital indicators in DESI 2019		EU
<b>2a1 At least basic digital skills</b>		<b>57%</b>
% individuals		2017
<b>2a2 Above basic digital skills</b>		<b>31%</b>
% individuals		2017
<b>2a3 At least basic software skills</b>		<b>60%</b>
% individuals		2017
<b>2b1 ICT specialists</b>		<b>3.7%</b>
% total employment		2017
<b>2b2 Female ICT specialists</b>		<b>1.4%</b>
% female employment		2017
<b>2b3 ICT graduates</b>		<b>3.5%</b>
% graduates		2015

Digital Economy and Society Index (DESI) 2019, Human Capital

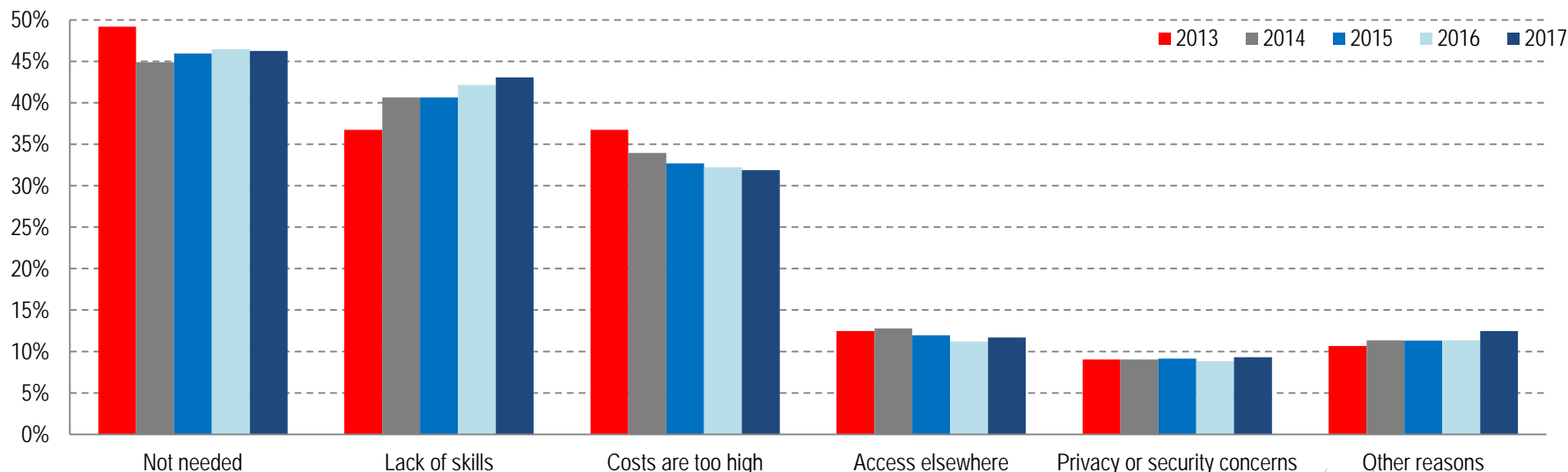
Source: DESI 2019, European Commission



Lack of need or interest, insufficient skills and cost-related barriers are the most common reasons for not having internet access at home. Digital skills are key to combat digital exclusion.

The three main reasons given for not having internet access at home remain, respectively, the lack of need or interest (46 % of households without internet access in 2017), insufficient skills (43 %) and high access and equipment costs (32 %). The deterring effect of each of these factors varies significantly in strength across Member States. For example, only 8 % of Danish households without internet access mentioned costs as a barrier but as many as 57 % did so in Croatia and Hungary. Lack of relevant skills remains by far the fastest-growing factor deterring households from having internet access at home. Moreover, given that this factor limits awareness of potential benefits from digitisation, it may also be among the reasons behind the large numbers of EU households that still claim not to have internet access at home because they do not need it.

Barriers to internet access at home in the EU, 2013-2017 (% households without internet access)



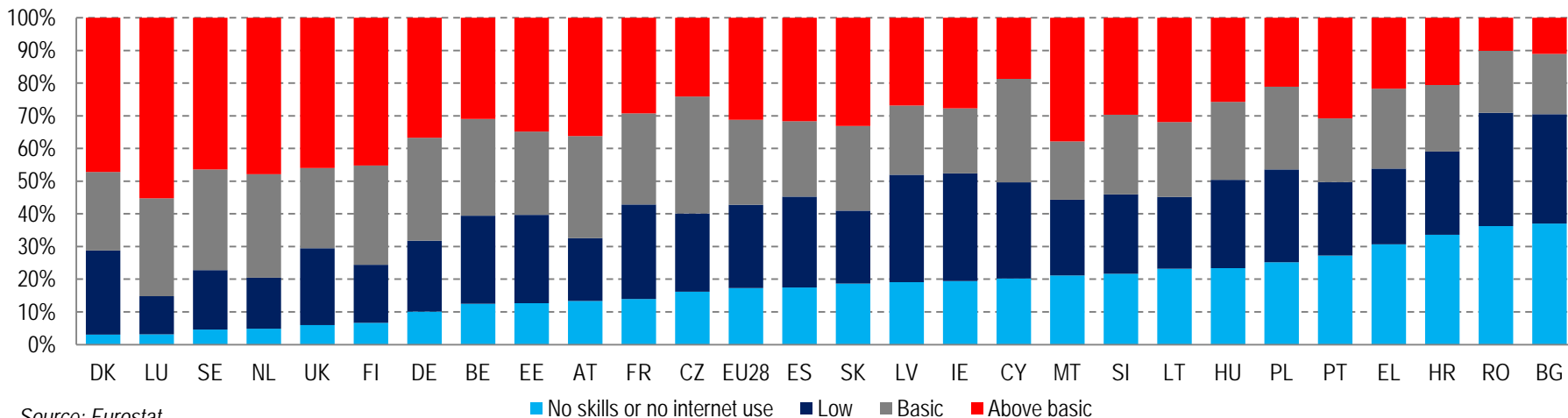
Source: Eurostat

In 2017, **43 %** of the EU population had an **insufficient level of digital skills**. 17 % had none at all, as they either did not use the internet or barely did so.

According to the digital skills indicator, a composite indicator based on the digital competence framework for citizens\*, 17 % of the EU population had no digital skills in 2017, the main reason being that they did not use the internet or only seldom did so. This represents an improvement (i.e. decrease) of 2 percentage points compared to 2016. The share of EU citizens without basic digital skills, in turn, went down by 1 percentage point (to 43 %). However, these figures imply serious risks of digital exclusion in a context of rapid digitisation. There are proportionally more men than women with at least basic digital skills (respectively, 60 % and 55 %). In addition, only about 31 % of people with low education levels or no education have at least basic digital skills. 49 % of those living in rural areas have basic digital skills compared with 63 % in urban areas.

There are still major disparities across Member States. The share of people with at least basic digital skills ranges from 29 % in Bulgaria and Romania (despite noticeable progress in both these countries in 2017) to 85 % in Luxembourg and 79 % in the Netherlands.

Digital skills of the EU population, 2017 (% of individuals, by skills level)\*\*



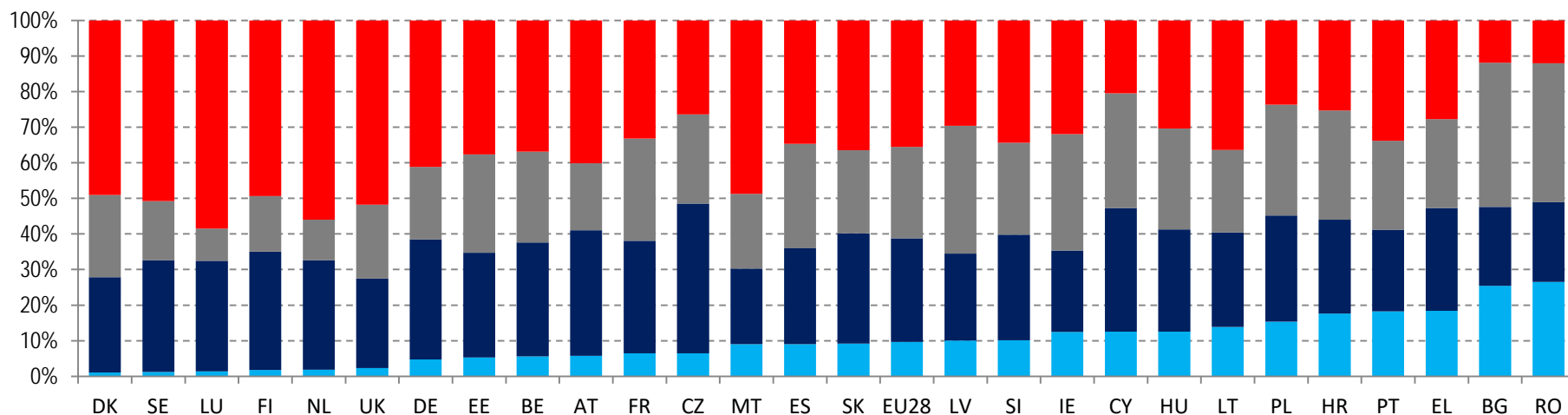
Source: Eurostat

\*More details at: <https://ec.europa.eu/jrc/digcomp>. \*\*To be classified as *low skilled*, an individual has to have carried out activities from only one of the four Digital Competence dimensions considered (information, communication, content-creation and problem-solving). *Basic skills* means that an individual has *basic skills* in at least one dimension, but *no skills* in none. To be classified as *above basic*, the individual has to score *above basic* in all dimensions. The latest data available on digital skills are for 2017. Data not available for Italy.

About 10 % of the **EU labour force** has no **digital skills**, mostly because they do not use the internet. 35 % does not have at least basic digital skills, which are now required in most jobs.

The share of the EU's active labour force (employed and unemployed) that can be considered to have no digital skills (essentially because they do not use the internet or do so only seldom) fell from 11 % in 2016 to 10 % in 2017. This share is much higher in Member States like Romania (26 %), Bulgaria (25 %) and Portugal (18 %), although they are among those showing the largest improvements in this respect. Conversely, a very large proportion of the labour force (between 82 % and 89 %) in Member States such as Luxembourg, the Netherlands, Finland and Sweden has at least basic digital skills. In addition, at least half of the labour force in each of these countries have above basic skills. Digital skills are critically important not only for accessing the labour market but also for harnessing the benefits of the digital transformation that is currently underway. Making sure the EU labour force has the necessary digital skills, including by addressing digital skills deficits in certain groups, such as older cohorts or blue-collar workers, will thus be essential to bring about an inclusive digital economy and society.

Digital skills of the EU labour force, 2017 (% individuals, by skills level)\*



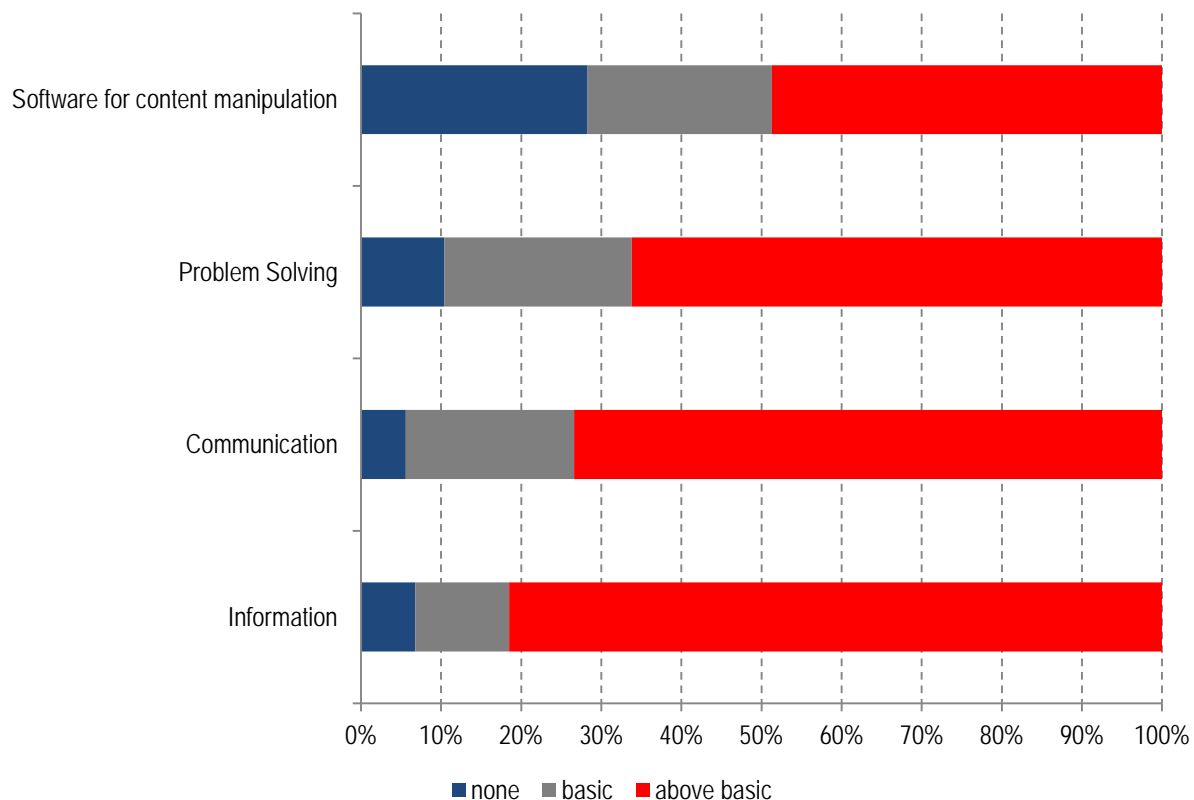
Source: Eurostat

\* Data not available for Italy

## Approximately 28 % of the EU's internet users have no software-related skills.

Advanced digital skills are becoming a prerequisite for entry into many jobs and have a wide range of applications, even beyond domains where they are needed for core tasks. Across competence dimensions, the largest skills deficit, both among the active labour force and the population at large, relates to the use of software for content manipulation. Almost one in three internet users in the EU has no skills in this area (i.e. they claimed not to have carried out any of the activities considered under this dimension, which range from relatively basic text treatment and spreadsheet-based work to video editing and coding). This share is particularly large in Member States like Bulgaria, Romania (about 51 % of internet users) as well as Latvia (40 %) and Ireland (39 %). Conversely, in others like Luxembourg, Portugal, the UK and the Netherlands, a large majority of internet users has above basic software skills (69 %, 58 % - both- and 57 % respectively). By type of activity, only about 7 % and 30 % of EU internet users had, respectively, written code and used advanced spreadsheet functions. In contrast, 82 % and 73 % can be considered to have above basic skills in the information and communication dimensions respectively.

Digital skills, by competence dimension and level, 2017  
(% of internet users)

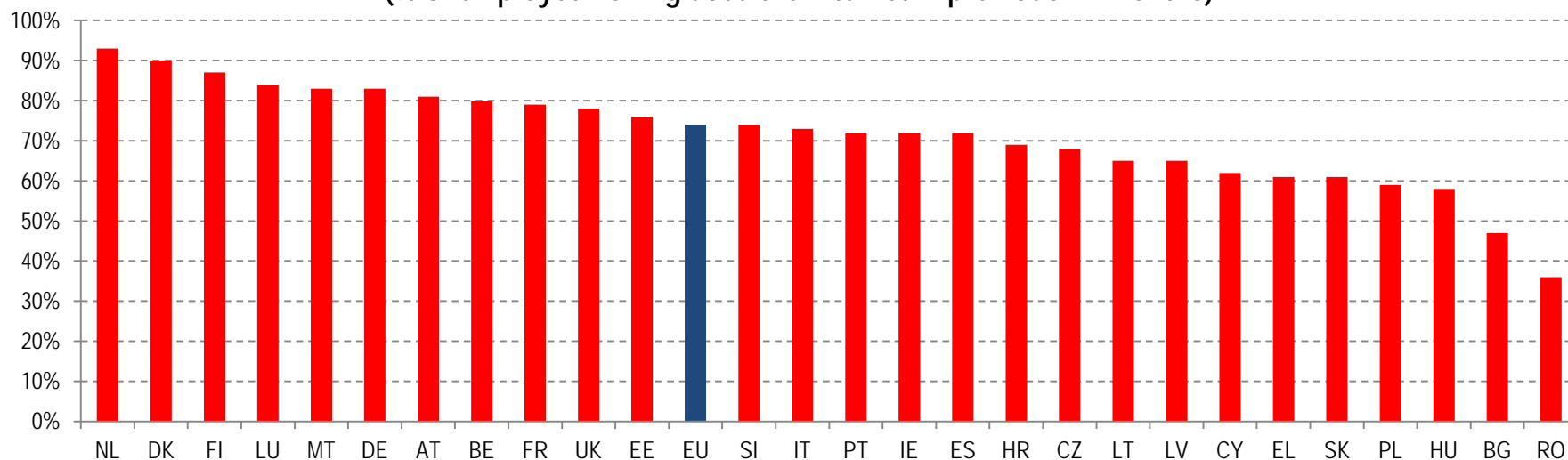


Source: Eurostat

## 74 % of internet users who were employed in the EU used computers or computerised equipment at work in 2018, with large disparities across countries.

In 2018, 71 % of EU internet users in employment reported to use computers, laptops, smartphones, tablets or other portable devices at work; 19 % of these workers used computerised equipment or machinery, such as those used in production lines, warehouses or delivery services. 74 % used ICT devices or equipment from at least one of those categories. The Netherlands had the highest rate of ICT usage by workers in the EU, as 93 % of its internet users in employment declared that they used computers or computerised equipment at work. It is followed by Denmark (90 %) and Finland (87 %). Conversely, the lowest ICT usage rates amongst the internet users in employment were observed in Romania (36 %) and Bulgaria (47 %), which is partly explained by these countries' low shares of ICT specialists in total employment.

Use of computers or computerised equipment at work, 2018\*  
(% of employed having used the internet in previous 12 months)



\* Data not available for Sweden

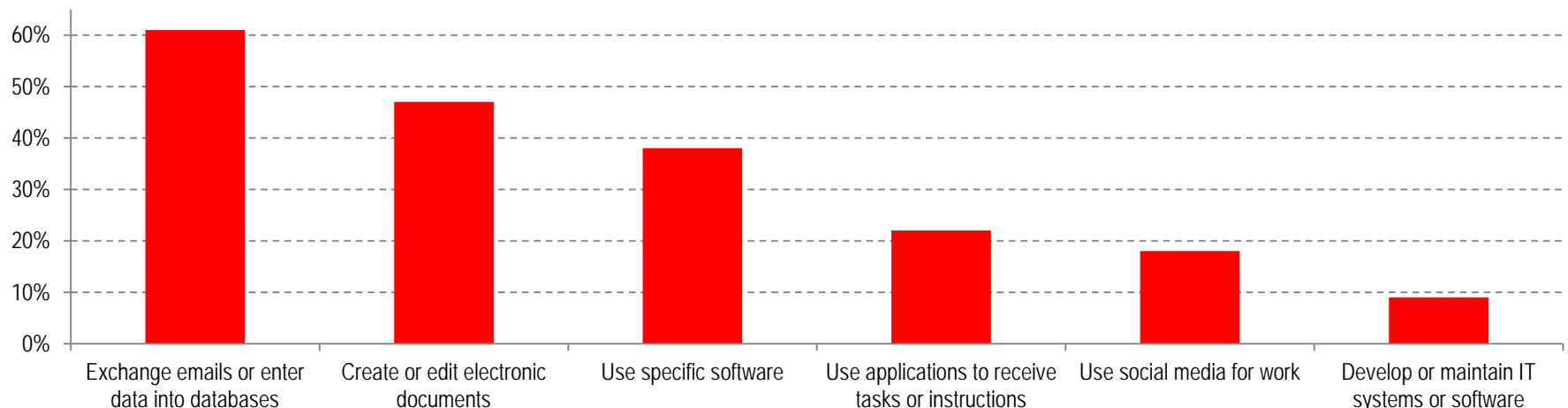
Source: Eurostat



**61 %** of internet users in employment used **email** or **entered data** into databases and **47 %** worked with **electronic documents** in 2018, but less than **10 %** developed or maintained **IT systems**.

The most common activities involving the use of computers, laptops, smartphones, tablets or other portable devices or computerised equipment at work were exchanging emails or entering data into databases (61 % of internet users in employment), creating or editing electronic documents (47 %) and using specific occupational software; e.g. for design, data analysis, processing, etc. (38 %). 22 % of internet users in employment worked with applications to receive tasks or instructions (excluding emails), and 18 % used social media for their work. Only about 9 % of internet users in employment were involved in developing or maintaining IT systems or software, although significant variations exist across Member States: from only 2 % in Romania, Bulgaria and Slovakia to 14 % and 15 % in Denmark and Finland respectively.

**ICT-related activities at work carried out at least once a week, 2018\***  
(% of employed people having used the internet in previous 12 months)



\* Activities not mutually excluding.

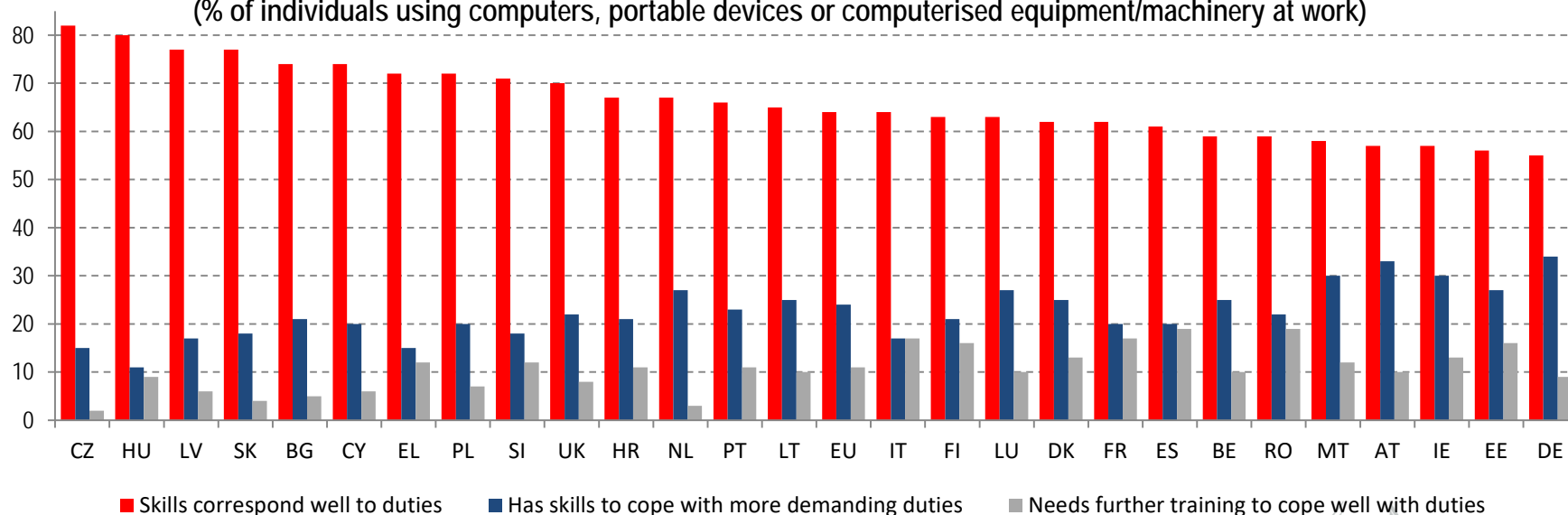
Source: Eurostat

## New software or computerised equipment entailed **changes in the main job tasks of 16 % of European internet users in employment** in 2018.

In 2018, 39 % of EU workers using some sort of ICT device or equipment declared that they had to learn how to use new software or computerised equipment for their job over the previous year. 21 % reported changes in their main professional tasks as a result of new software or equipment being introduced during same period, and 20 % said they were involved in choosing, modifying or testing the software or computerised equipment used at their work. The highest shares of ICT-using workers whose main job tasks changed due to new software or computerised equipment were registered in Denmark, Luxembourg and Portugal (all 30 %). Cyprus (5 %), Latvia (11 %) and Bulgaria (12 %) had the lowest shares.

About 64 % of the EU's workers using ICT devices or equipment deemed their skills relating to the use of computers, software or applications at work corresponded well to their duties, whereas 24 % said they had the skills to cope with more demanding duties and 11 % admitted that they needed further training. Approximately 12 % of the EU's internet users (regardless of employment status), in turn, relied on on-the-job training to improve their digital-related skills; 11 % on free online training or self-study and 9 % on training provided by their employer\*.

Skills relating to use of use of computers, software or applications at work (self-assessed), 2018\*\*  
(% of individuals using computers, portable devices or computerised equipment/machinery at work)



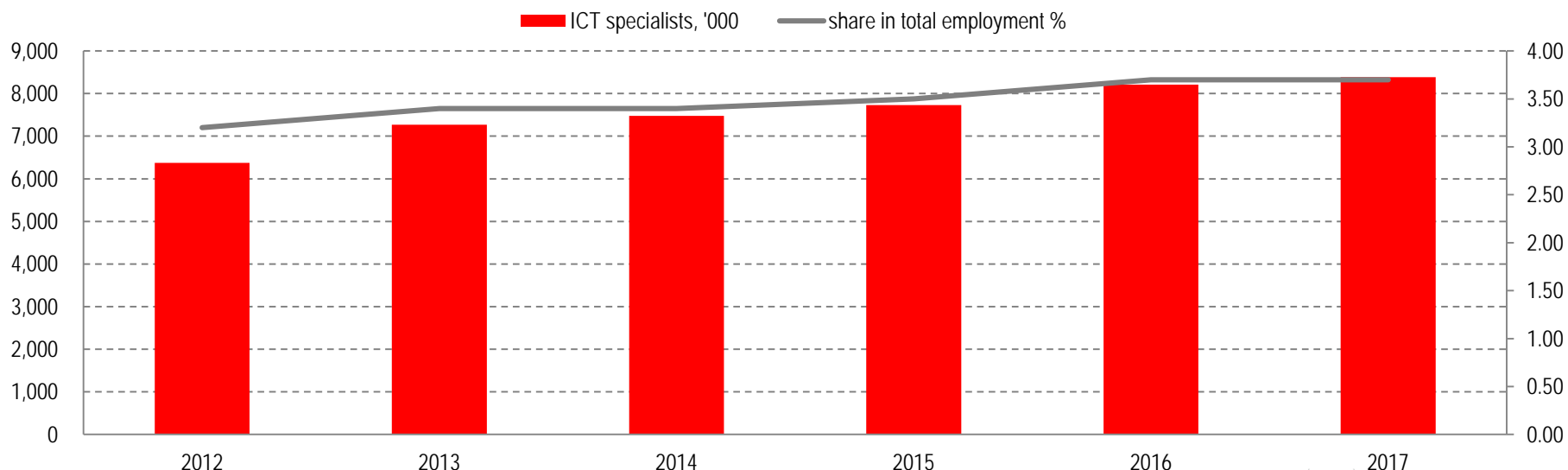
\* Activities not mutually excluding. \*\* Data not available for Sweden

Source: Eurostat

## The number of ICT specialists employed in the EU reached nearly 8.4 million in 2017, but the employment potential of people with specialised ICT skills remains underexploited.

In 2017, nearly 8.4 million people were employed as information and communication technologies (ICT) specialists in the EU. This amounts to about 3.7 % of total employment. These figures represent a slight increase compared with a year earlier. Although the progression is less strong than in 2016, it remains significant from a long-term perspective: between 2007 and 2017, the number of ICT specialists employed in the EU grew by 36 %, compared with a 3.2 % increase in overall employment. Nearly 83% of all ICT specialists employed in the EU in 2017 were men, and about 62 % had at least tertiary education. The Member States employing the most ICT specialists were the UK (1.6 million), Germany (1.5 million) and France (1 million). The highest shares of ICT specialists in total employment were recorded in Finland (6.8 %), Sweden (6.6 %) and Estonia (5.6 %); the lowest in Greece (1.6 %), Romania (2.1 %) and Portugal (2.2 %). In 2018, 1 in 5 companies in the EU employed ICT specialists and nearly 1 in 10 recruited or tried to recruit ICT specialists. However, 53 % of companies that recruited or tried to recruit ICT specialists in 2018 reported difficulties in filling vacancies, compared to 41 % a year earlier. This situation, combined with evidence on the growing number of ICT vacancies, suggests that the gap between demand and supply of ICT specialists may be widening in the EU, and that the employment potential of people with specialised ICT skills remains underexploited.

### Employment of ICT specialists in the EU, 2012-2017



Source: Eurostat

Through its **Digital Skills and Jobs Coalition**, the Commission seeks to further reduce digital skills gaps by fostering the sharing, replication and upscaling of best practices in areas such as training and matching for digital jobs, certification and awareness raising.

The Digital Skills and Jobs Coalition is one of the 10 key actions under the New Skills Agenda for Europe. It has been operational since 2016 and brings together Member States and stakeholders from the private and public sectors to develop a large digital talent pool and ensure that Europe's citizens and labour force are equipped with adequate digital skills.

As of mid-2018, more than 100 companies, education providers and NGOs have made pledges to reduce digital skills gaps by providing measures such as training courses, matching for digital jobs, certification and awareness raising. 23 National Coalitions for Digital Skills and Jobs have also been created in the EU Member States.

members of the Digital Skills and Jobs Coalition have so far offered 10.9 million people in the EU a chance to improve their digital skills. In total, 7.4 million digital skills training courses were provided, 1.9 million certifications were delivered and 1.6 million people were reached through awareness-raising campaigns.



Furthermore, the Digital Opportunity Traineeship, which was launched in 2018, will provide cross-border traineeships for up to 6,000 students until 2020. The aim is to provide students of all disciplines with hands-on experience in digital-related fields demanded by the market. Trainees will strengthen their ICT specific skills, in fields like digital marketing, software development, cybersecurity and big data. More than 3,000 traineeships have already taken place throughout the EU and in partner countries during the first year of implementation.