

# DIGITALEUROPE AND THE EC'S SKILLS STRATEGY 2016

Recommendations from DIGITALEUROPE  
Boosting the skills for the future of digital Europe  
13 January 2016

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## Synopsis and Recommendations

Exploitation of digital technologies has a crucial role to play in Europe's future prosperity and well-being. The single largest obstacle to harnessing the power of digital technologies and its transformation potential is a shortage of skills, particularly digital technology experts, where the shortfall is currently estimated at just over 700,000.

Digital skills are essential to ensure that both business and individuals can take full advantage of modern technologies and of their potential for job creation. Likewise, digital skills are crucial for the successful digitisation of the industry, and to reduce the high level of unemployment in Europe.

As Commissioner Oettinger has outlined in one of his recent statements, "We need better digital skills, if we are serious about the digital transformation of Europe"<sup>1</sup>.

This position paper articulates our recommendations to the European Commission for closing the digital skills gap. We provide concrete recommendations for actions that could be included in the European Commission's Skills Strategy to be published, we understand, in May 2016.

These recommendations reflect, among others, our work under the Grand Coalition for Digital Jobs<sup>2</sup> and the eSkills for Jobs campaigns<sup>3</sup>, two European Commission initiatives that have already contributed to reduce the digital skills gap in Europe.

DIGITALEUROPE would urge the European Commission to include the following actions in its forthcoming Skills Strategy Communications to be published in May 2016.

1. Foster digital skills training programmes
2. Harness industry-led education
3. Accelerate the encouragement of labour mobility for digital jobs
4. Bolster National Coalitions for Digital Jobs
5. Raise awareness of the role played by technology in the EU's digital single market and the digital career opportunities available
6. Ensure availability of EU funding dedicated to upskilling initiatives and training platforms at EU level
7. Inspire girls to pursue IT studies and careers and encourage better gender balance by promoting a stronger role of women

Details of specific actionable short term recommendations can be found in the following pages.

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<sup>1</sup> [Speech at the European Digital Jobs Fair](#), Commissioner Oettinger, Madrid, 20 November 2015.

<sup>2</sup> [Grand Coalition for Digital Jobs](#), Digital Agenda for Europe

<sup>3</sup> [eSkills for Jobs Awareness Raising Campaign](#)

## Background

The economic growth in Europe relies on innovation and on the successful transformation of businesses. The digital economy is vibrant and growing rapidly. In order to gain efficiency, establish new markets and develop new business models, companies and public services are investing in advanced digital technologies such as mobile communications, cloud computing, big data analytics and smart devices. The adoption of these technologies has massive transformative power, adding genuine value to society and providing tools for the next generation of entrepreneurs across Europe. This is especially true today, as digital technologies are transforming every area of economic and social life. We must ensure that these benefits are felt throughout Europe.

However in order to drive a successful digital transformation, harnessing digital and entrepreneurial skills has become a pre-requisite for success. The skills demand must be addressed to enable economies to take advantage of the productivity gains from adopting digital solutions, meet the growing industry demand for skilled staff, and increase opportunities for young talents in today's difficult job market.

While new technologies are widely adopted, and at the same time create new types of jobs that have not existed before, the demand for highly specialised skills is growing rapidly. By 2020, Cloud Computing has a potential to generate 2.5 million cloud-related jobs<sup>4</sup>. In Germany alone, SMEs could create 670,000 new jobs by using technology effectively<sup>5</sup>. Digital jobs contribute to job creation also outside of tech Industry: for every high tech job, up to four non high-tech jobs are created in the local economy<sup>6</sup>.

Over the last years, the number of ICT jobs has been growing faster than any other job category. Employment of ICT professionals has grown more than 3% per year (for the last 10 years). These ICT professionals work in all sectors of the economy and represent 2,8% of our workforce<sup>7</sup>. Notwithstanding this, Europe is faced with a significant shortage of people capable of filling existing and newly created digital jobs. According to European Commission estimates, an additional 150,000 IT experts are needed every year in Europe. It should also be noted that the number of fresh IT graduates is not keeping up with the demand.

The different growth rates found between the demand and supply of digital technology experts is the origin of what is termed the digital skills gap.

Initiatives from the European Commission including the eSkills Week and eSkills or Jobs campaigns held since 2010, and the Grand Coalition for Digital Jobs launched in 2013 have contributed to reducing this gap. Whilst still high at just over 700,000, the digital skills gap is slowly but surely reducing (the gap was estimated in 2010 at + 1 million).

The ICT industry, and its European umbrella association DIGITALEUROPE, have been heavily involved in these initiatives aiming to increase the supply of ICT professionals throughout Europe and to further contribute to reduce the digital skills gap.

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<sup>4</sup> [Uptake of Cloud in Europe](#), Final report, A study carried for the EC by IDC, 2013

<sup>5</sup> Digital Transformation of European Industry and Enterprises. A report of the Strategic Policy Forum on Digital Entrepreneurship, 2015

<sup>6</sup> [High Technology Employment in European Union, Discussion Paper](#), University of Leuven, December 2013

<sup>7</sup> EC's video: <https://www.youtube.com/watch?v=BK-UuUnQalM>.

## Skills for digital transformation

But the industry cannot do this alone. The digital transformation that Europe is currently facing requires an even greater engagement from policy makers and educators, not only to reform curricula and ensure that the new generations are equipped with the relevant skills to live and work in the current digital world, but also to support initiatives to boost digital and entrepreneurial skills outside of the formal education systems.

A revision of employment legislation is also required to bolster lifelong learning. Companies must be able to embrace change brought by the digital revolution by addressing the skills demand and adapting their working models; young people and employees must constantly increase their knowledge base, skills and competences throughout their life.

In order to make sure that both industry and citizens are ready to take advantage of the digital transformation, new and innovative models of cooperation must be established among all relevant stakeholders. The digital transformation will change the way companies do business and consequently the skills set they expect from their workforce.

Those organisations that decide to embark into the digital transformation are looking for new types of skills. Examples include skills in the areas of Digital Security, Business Networks, Big Data Analytics, Internet of Things, Mobile Technologies, Cloud Computing, Business Change Management, InMemory Database, Integrated Product Service, Smart Grid Technologies or Novel Interfaces. Other trends that will disrupt the economy will include 3D printing, advanced robotics, artificial intelligence and virtual reality.

The specific skills in these areas include, amongst others, product and network security, data privacy and security expertise, data analytics, data scientists, big data engineering, data management, design skills (platform design, user interface) or app development.

However, companies seem to face shortage of skilled employees in these areas. They do not have enough personnel with the skills necessary for the digital transformation. Only 17% of companies are confident they have the right skills according to a recent study. Even less companies have implemented a dedicated recruitment and training programme to close this skills gap<sup>8</sup>. According to the study “Digital Talent Gap” by Cap Gemini Consulting, 87% of companies realise digital transformation is a competitive opportunity but over 90% of companies lack digital skills. 50% of companies realise ‘mobile’ is a key skill for digital transformation but over 80% face talent shortages. Startups and SMEs have even more difficulty in accessing talented staff. As a consequence they should develop their own comprehensive training programmes, provided they have the wherewithal to this effect. Study by Empirica showed 70% of SMEs leaders are using ad-hoc self-learning to improve their skillset.

This change will affect not only the ICT industry sector, but the entire business ecosystem. Many non IT positions in the area of finance, project management, sales, consultancy or legal require an understanding of the new technologies. In the near future, 90% of jobs will require a certain level of digital skills. Digitally transforming enterprises also need leaders, innovators, initiators who transform organisations, work in them or create them anew. There is a lack of managers with such a skillset. It is estimated that up to 250,000 practitioners and managers with e-Leadership skills will be needed by 2020 according to Empirica’s study on e-leadership.

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<sup>8</sup> Skills for Digital Transformation, Technical University in Munich and SAP, December 2015  
[http://www.i17.in.tum.de/fileadmin/w00btn/www/IDT\\_Skill\\_Report\\_2015.pdf](http://www.i17.in.tum.de/fileadmin/w00btn/www/IDT_Skill_Report_2015.pdf)

While it is true that digitisation and automation is replacing some jobs, we have also seen entirely new jobs being created and we have seen a rise in demand for others.

In addition to pure technical digital skills, industry needs to rely on soft skills and skills relevant for business growth. The workforce requires the ability to embrace change, spot opportunities and adapt strategies, work in teams, think creatively, be self-motivated and with a will to continuously learn. Hybrid skills are of key importance: IT and business; but also engineering or combination of Technology and Business Administration.

## Key enabling technologies

Key Enabling Technologies (KETs) provide the basis for innovation in a range of products across all industrial sectors. They underpin the shift to a greener economy, are instrumental in modernising Europe's industrial base, and drive the development of entirely new industries. Their importance makes them a key element of European industrial policy.

KETs are a group of technologies that have applications in multiple industries and help tackle societal challenges. They include micro and nano electronics, nanotechnology, industrial biotechnology, Internet of Things technologies, advanced materials, photonics, and advanced manufacturing technologies.

KETs are among the priority action lines of European industrial policy. The European Strategy for KETs aims to increase the exploitation of KETs and to reverse the decline in manufacturing as this will stimulate growth and jobs.

One of the major weaknesses of Europe with regards to KETs lies in the difficulty of translating its knowledge base into marketable goods and services. This innovation gap has been identified as the European 'Valley of Death'. KETs-related manufacturing is decreasing in the EU and patents are increasingly being exploited outside the EU.

What is more, Europe faces a shortage of skilled labour with large and small companies capable of handling the highly multi-disciplinary nature of KETs.

## Detailed recommendations

Without appropriately digitally skilled people, the digitisation the European economy will become problematic. Europe should invest in skills to establish a global leadership position in the digital economy. Not only do we need to work together on innovative training programmes and apprenticeships, but also to raise awareness about the attractiveness of digital jobs that exist across all sectors of the economy. Europe should ensure that training in digital skills is included in schools and university curricula.

Our recommendations are built around several thematic areas that we believe are crucial to bridge the skills gap. We would encourage the European Commission to include these specific actions in the Skills Strategy Communication.

### 1. Foster digital skills training programmes

Industry has been working closely with schools, universities, employment agencies and NGOs to set up innovative programmes to supply people with key skills necessary for the digital transformation. For example, they have been offering Massive Open Online Courses (MOOCs), apprenticeships and programmes to upskill and retrain staff internally. Industry has been promoting ICT and STEM careers through their online platforms training people with the skills needed to get into digital jobs. Jointly with academia, industry has also developed curricula for Industry 4.0. Additional specific actions to be deployed by the European Commission include:

- Expand the use of the EC's ICT Vouchers to include digital training for SMEs.
- Bolster apprenticeship schemes across Europe focused on digital careers; create a pilot by building on a PPP between industry, vocational training organisations and universities and public employment agencies.
- Encourage links between digital demand and digital supply to increase digital employment (and reduce the skills gap); amplify current industry led and European initiatives (such as the pledges made in the context of the Grand Coalition for digital jobs) by fostering the links with national public employment agencies and public and private training organisations.
- Bridge the gap between digital job opportunities, skills of people seeking digital employment, and digital training opportunities (through public and private training organisations) by developing a European and Member State repository, perhaps in the form of a dedicated website.
- EU and national policy makers should ensure that current education approaches are enhanced by a set of actions to improve cybersecurity know-how in the whole of society<sup>9</sup>.

### 2. Harness industry-led education

New and innovative models are needed to adapt to the fast changing environment, where old actors come together creating added value beyond the traditional cooperation models. The following cooperation models offer a potential to reduce the skills gap.

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<sup>9</sup> Public Private Partnerships in Network and Information Security Education, October 2014, ENISA: [https://www.enisa.europa.eu/activities/stakeholder-relations/nis-brokerage-1/public-private-partnerships-in-network-and-information-security-education/at\\_download/fullReport](https://www.enisa.europa.eu/activities/stakeholder-relations/nis-brokerage-1/public-private-partnerships-in-network-and-information-security-education/at_download/fullReport)

- At University level (Bachelors, Masters), provide students with the skills they need to get ahead in the digital careers in the ICT and other sectors. This should be based on employer involvement in the curriculum which in turn should include both technological and business skills in the area of Big Data, IoT, Cloud and other technology trends. The curriculum should also focus on improving security of products and networks. Examine best practices, assess what would be needed to export these and launch a pilot to roll out a pan European program.
- At upper secondary level (16-18) and vocational training, provide students with the skills they need to get ahead in the digital careers in the ICT and other sectors. This should be based on employer involvement in the curriculum which in turn should include both technological and business skills. Examine best practices, assess what would be needed to export these and launch a pilot to roll out a pan European program.
- Create a common understanding of future technology careers and digital skills, across all sectors with a focus on the digital transformation of European businesses (large and SMEs) and a focus on growing and emerging technologies such as green tech, Internet of Things, Big data, security, Virtual reality, etc.

### 3. Accelerate the encouragement of labour mobility for digital jobs

- Contribute to the success of Europe's Digital Single Market strategy and promote the uptake of digital jobs across Europe. This should be undertaken through European Digital Jobs Fairs organised under a PPP model where industry, private and public sector employment services and European mobility portals would work together.
- Call on the implementation of the common European framework for ICT Professionals in all industry sectors.

### 4. Bolster National Coalitions for Digital Jobs

- Encourage the setup of national skills platforms to provide guidance, engagement and management of actions across all stakeholders at national level (industry, academia, public services and relevant Ministries). The European Commission should provide some seed funding to cover basic set up costs. Member States should ensure that digital skills are included in curricula through the whole education cycle and support the EU Code Week initiative.
- Formalise the links between national coalitions, their national government departments with skills and jobs portfolios, the local European Commission representative offices and relevant European Commission Directorates General to ensure the identification of, and subsequent uptake of European funds (ESF, ESS, Erasmus+....) to be allocated to actions linked to the national coalitions.
- Pilot across Europe, based on the fTI model in Spain, a PPP scheme that allocates public funding to digital training. The focus would be to create a structure that would act as broker between state employment agencies, job seekers, IC training providers and industry corporates. Based on a well-documented model, the state could fund a programme at 100% that would guarantee that at least 60% of job seekers who gain digital training through nationally certified training organisation are ultimately employed by industry.



- Rely on the Grand Coalition for Digital Jobs to share best practices, learn, and identify common needs. Ensure high level political support across the European Commission Directorates General and extend the platform to all Industry. The Grand Coalition should:
  - provide guidance on the implementation of the national skills strategies focusing on the skills supply in the area of Cloud, Big Data and IoT;
  - develop a toolkit with steps to implement strategies and facilitate workshops in member states;
  - identify best practices and innovative cooperation models to enable relevant stakeholders to join or scale the initiatives at the pan European level;
  - create guidelines for small businesses on ways to boost key tech skills, and facilitate organising apprenticeships in digital roles.

## 5. Raise awareness of the role played by technology in the EU’s digital single market and the digital career opportunities available

- The European and member state eSkills awareness raising campaigns organised by the European Commission since 2010 have contributed to reducing the predicted 2020 skills gaps from around 1m to just over 700,000 (latest forecasts). As unemployment levels remain high and, juxtaposed with emerging technologies (products and services), there is a need in to increase understanding of and promote digital careers across all the sectors and organisations, not only across IT industry, and especially among women.
- Given the fast moving nature of technology, the digital skills in demand are constantly evolving. In order to broker the appropriate relationships between demand and supply, the European Commission should launch a survey on specific skills requirements across Europe with a focus on key enabling technologies.
- Digital skills and jobs for the key enabling technologies of the future. New jobs will be created as new market trends evolve. Europe needs to do more to ensure that young people, students (primary, secondary and tertiary), the unemployed and ICT professionals are made aware of these.

## 6. Ensure availability of EU funds dedicated to upskilling initiatives and training platforms at EU level

- The European Commission could establish a short term Digital Skills Investment Task Force comprised of individuals including leading thinkers from within the Commission, representatives from business and industry, and recognised experts from academia and the OECD. Their mission would be to provide objective analysis of the programmes and reforms within the Youth Employment Initiative (YEI) and other EU funds (European Structural Funds, European Social Funds, Erasmus +, etc) to identify and promote best practices and assist Member States in the effective and timely use of the funds to increase skills supply and provide lifelong learning.

## 7. Inspire girls to pursue IT studies and careers and encourage better gender balance by promoting a stronger role of women

- Women can and have to play a stronger role in our future Digital Society. Digital Jobs represent a great opportunity to create a more gender balanced society and women can bring a lot of expertise and capacity to this sector. The European Commission should put much more efforts to promote Digital Disciplines and to work closely with National Education Systems. Women should be encouraged at school and during their professional careers to take full advantage from Digital Jobs.
- Industry can play an important role by collaborating with Schools, Universities and Associations in order to promote Digital opportunities and to take all measures needed to facilitate women work placement and integration (i.e. champion female role models; open days in tech businesses; etc).
- The Grand Coalition for Digital Jobs could play a role in promoting women in digital domains, by encouraging the submission of the pledges focusing on attracting and retaining women to technology area and identifying best practices.
- Member States could launch the Digital Women Awards at the national level to identify and award female national champions, based on the concept of the European Ada Awards.
- Promote inclusion initiatives in companies to attract the attention from girls into the tech space (i.e. champion female role models; open days in tech businesses; coding and app development workshops etc.). The Grand Coalition for Digital Jobs and the eSkills for Jobs 2016 campaign could promote these best practices across Europe by creating a comprehensive list of initiatives.
- Successful national initiatives aimed to attract more girls to ICT could be duplicated across EU through the work of the National Coalitions. One of the examples is the TechFuture Girls project, after school clubs for girls aged 9-14 launched by The Tech Partnership (the National Coalition for UK).

## Examples of Industry-based training programmes and supporting actions

### BAIT (Bulgaria)

- BAIT provided engagement and management of actions across all stakeholders at national level (industry, academia, public services, Ministry of Labour, Ministry of Education, and the Council of Ministers)". BAIT together with the Council of Ministries and Ministry of Education and Science created the national Strategy for 30 000 new IT specialists. On 16 of December 2015 the Council of Ministries approved the strategy and took a decision on its implementation. There will be established Advisory Board to The Ministry of Education and Science where BAIT will have 2 representatives.
- Also in collaboration with the Bulgarian Employment Agency All labour offices throughout Bulgaria provide information about all current trainings and courses in the field of information and communication technologies (ICT), conducted by the leading companies in the sector. This became possible thanks to the good partnership between the Bulgarian Employment Agency and BAIT within the EC initiative eSkills for Jobs. The labour offices experts inform registered unemployed persons about opportunities for involvement in ICT training and job vacancies in the sector in the process of individual consulting.
- 3rd great achievement within the eSkills campaign is that BAIT together with the Council of Ministers and Ministry of Labour and Social affairs worked on improvement of the procedure of blue cards. By decision of October this year The Council of Ministers adopted a decree amending the Ordinance on the terms and conditions of issuance, denial and revocation of work permits for foreigners in Bulgaria. The changes are intended to simplify the procedure for issuing the "EU Blue Card" for the exercise of highly qualified employment of foreigners from third countries. One of the novelties is dropping the requirement for the employer for a preliminary study of the workforce - ie. "Market test". The amendment concerns only employment in professions specified in the list of professions for which there is a shortage of highly qualified specialists. The very list will be drawn up at the proposal of the nationally representative organizations of employers and will be approved by the Minister of Labour and Social Policy debated in the National Council on Labour Migration and the National Council for Promotion of Employment. It will be updated annually by 31 January. BAIT has already sent the list to the Minister of Labour and Social Policy for approval.

### CISCO

Cisco Networking Academy is an IT skills and career building program for learning institutions and individuals worldwide. More than 5 million people have joined the Networking Academy and become a force for change in the global economy since 1997.

Present in 28 EU Member States, Networking Academy is one of the pillars of Cisco's Corporate Social Responsibility policy. Through Public Private Partnerships, it delivers classroom instruction, online teaching materials, interactive tools, and hands-on learning to students from every socioeconomic background, so that they can develop the knowledge and skills required to succeed in a technology-driven market.

The Internet of Everything will generate unparalleled demand for skilled workers and opportunities for creative, tech-savvy people everywhere. The Networking Academy identifies and develops the skills people and businesses need to thrive in a changing economy.

- Our courses provide in-depth technology training to prepare for certification, and encourage students to solve problems and work together, just as they will in the workplace.
- Our curriculum is translated into multiple languages and delivered via an online learning platform to make the experience both personally relevant and globally recognized.
- Our community of support and training centres prepares local instructors to coach and mentor students in hands-on labs and supports consistent implementation of the program.
- Our partnerships with employers and community agencies help students transition from classroom to career path.

From secondary schools to universities to community organizations, more than 9,000 institutions in 170+ countries offer the Networking Academy curriculum. Together, we are building the workforce of tomorrow.

## DELL

Dell believes that access to education and technology is not a luxury, but a necessity. That's why we work directly with non-profit organizations around the world to close the learning gap and give young people the power to discover better possibilities. Dell provides grant funding, as well as our latest technology. A local Dell Champion manages the deployment and upkeep of Dell systems and solutions, and local team members volunteer their time to support the organization's needs. Dell also addresses any basic or community needs that might hamper a child's ability to learn, such as food or security. This shared responsibility between Dell and the community - supported by Dell volunteers - brings about real learning opportunities and change.

In France we work with the Fondation Agir Contre l'Exclusion (FACE), dedicated to developing and promoting innovative action to combat exclusion by enhancing education, training and employability. The program provides vocational guidance, training and links to occupational internships to help thousands of junior high students from economically challenged areas. FACE and Dell are working together to close the gap in technology through multiple innovative projects, one of them: "Wi-Filles", also focusing on reducing the gender gap by inspiring and equipping 14 to 16 year-old girls from deprived areas with skills and resources to pursue opportunities in the field of computing.

In the United Kingdom, we are committed to helping Action for Children to ensure that vulnerable young people are able to access technology and successfully connect with the digital world. One of their key programs: Inspire IT has been a vital part of support provided to young people with complex and challenging lives giving them the opportunity to enhance their education and career opportunities. The program brings project staff and young people together to clearly identify barriers and needs, address fears and frustrations, and demonstrate the transformational impact of enabling access to online learning, new technologies and a digital curriculum.

We also partner with UK-based Transformation Trust on the Powering Transformation challenge, which focuses on how young people view their community and what they see as their biggest challenge. Schools taking part in the program have access to Dell's latest high-tech equipment for one week to complete a

Team and/or Mini Challenge. During that week students choose an issue that is important to them and the changes they would like to see. Students then create two parallel representations using the technology available to them: one illustrating how they see their community now; the other showing how they would like their community to be. In the Mini Challenge, students are tasked with recording an interesting and engaging two-minute video outlining the issue, why it matters to them and an innovative technological solution to address it.

## FUJITSU

### Fujitsu Virtual Training Academy – “pilot operation” started in Europe.

Fujitsu has been working on 3D Immersive Learning Platform "Fujitsu Virtual Training Academy" during last years. The pilot operation started with a “Train the Trainer” session for Fujitsu Sales trainers. Encouraged by the consistently positive feedback from participants, Fujitsu is now planning follow-up events before going live at the start of 2016. This Platform allows a much deeper involvement of Employees and foster the collaborations among participants during Trainings. It also allows high level Trainings with Partners, Customers, new comers and any other stakeholders. It allows intensive Training courses and interactions crucial in a Global Company and reduces the Carbon Footprint by consistently reducing the need of traveling.

## GOOGLE

Together with partners from different industries, associations and governments, Google has been the key driver of many different digital skills training initiatives across Europe - with a different approach in every country to reflect Europe’s cultural and educational diversity.

In Spain, for example, [Activate](#) focuses on youth unemployment and offers free courses on subjects like web development, digital marketing, and e-commerce.

In Germany, where unemployment is less of a problem, Google has decided to focus on online export with [Weltweit Wachsen](#), and have trained thousands of SMBs. These trainings happen both online and in the physical world, thus offering both local and scalable learning solutions.

Examples from other countries include:

- [Made in Italy](#) showing thousands of traditional Italian craftspeople how to sell and market their wares online, as well as Crescere in Digitale, which helps people find internships.
- [Digital Garage](#) in the UK, offering face to face trainings in five cities to small businesses looking to enhance their digital presence.
- [Google Pour les Pros](#) in France, supporting SMEs via meetings at their shops, training them on digital skills and matching them with young graduates.

## Hewlett Packard Enterprise

From the beginning, our founders, Bill Hewlett and Dave Packard, believed their company should create great products and help make the world a better place. This commitment is fully integrated in our strategy and culture. We believe in a better future and in the power of people empowered by technology. That is why HPE takes its responsibility as a leader in the Digital Economy seriously and continues to support eSkills through partnerships and investment, HPE supports a number of programmes and initiatives to help boost the digital skills of young people from primary school to graduate age. For the last 15 years, HPE have run CodeWars, a first-class computer programming competition for high school students. This is an international event, held in the 2015 in Barcelona and Newcastle. A CodeWars event successfully combines several quality ingredients: a high-tech setting, a wide range of programming challenges, plenty of programmer food, music, plus giveaways - all in an exciting, stimulating, and competitive environment.

In Italy, since 2014, we have opened three CoderDojo centers in Milan, Rome and Bari to promoting coding for kids between 8 and 15 years. The Dojos provide free trainings on basic and advanced coding, sensors and making. In 2015, we engaged up to 500 kids with more than 1.500 training hours delivered.

Running in Italy, Safe2Web provides schools with awareness training to help young people stay safe online, including learning about the issues associated with online bullying. In the 2015, we met 2.000 kids in 60 schools, delivering over 4.500 training hours.

In the UK, through the financial investment and active intellectual support from Hewlett Packard Enterprise, [TechFuture Girls](#) programme is free for all schools in England. To date, over 1000 schools have been able to start computer clubs that encourage girls to stay engaged in the study of Information Technology, and we are on track to achieve our target of 2000 schools by the end of the academic year.

HPE's [Strategic University Partnerships](#) sees the company working collaboratively with a number of UK University's to create new types of technology-related courses. As a result, students emerge with both a professional qualification and academic one. HPE collaborates with these partners through the provision of internships, mentoring, and assistance with teaching.

In December, Hewlett Packard Enterprise launched a new initiative called the [Living Progress Challenge](#), a crowdsourcing initiative aimed at finding the best solutions for how technology can tackle social, environmental and economic problems. We expect a significant portion of the problems addressed by the challenge to include those associated with digital exclusion, for example, one of the first issues we anticipate looking at is the question of financial exclusion and literacy.

## HUAWEI

### 1. Seeds for the Future programme

Seeds for the Future is Huawei global CSR flagship program. Initiated in 2008, the program seeks to develop local ICT talent, enhance knowledge transfer, promote a greater understanding of and interest in the telecommunications sector, and improve and encourage regional building and participation in the digital community. As of September 17, 2015, the program had been implemented in 54 countries worldwide. In Europe the program had been implemented in 23 European countries (The UK, France, Germany, Italy, Spain, Portugal, Switzerland, the Netherlands, Belgium, and Ireland, Denmark, Sweden, Norway, Hungary,

Romania, Serbia, Poland, Greece, Austria, Slovenia, Bulgaria, Iceland, and Macedonia). Over 500 EU students have participated so far. The plan is to invite 2 000 students between next year and 2020.

Benefits of the program:

The program benefits a variety of stakeholders, including countries and local communities, universities and education institutes, students, and the local ICT industry.

- Benefits for countries and local communities: The program is in line with the digitization strategies of many countries. It helps cultivate and pool together ICT professionals that are crucial to industry development, thus boosting ICT industry growth, driving the development of different sectors, and contributing to lower unemployment rates over the long term.
- Benefits for universities and education institutes: The program helps local universities improve their teaching and scientific research capabilities in the ICT sector and provides students with high-quality courses and opportunities for hands-on practice.
- Benefits for students: Students in the program can enhance their abilities to adapt to the ICT industry as they learn more about state-of-the-art technologies and skills, as well as the innovation needs of the local market. By acquiring skills, students are able to gain confidence, which helps them to excel in their careers and in multi-cultural business environments.

## 2. Huawei Innovation Research Programme

The Huawei Innovation Research Program (HIRP) is a mechanism for open collaboration between Huawei and academic institutions. It offers long-term project funding to academic partners all over the world. With flexible collaboration models for all phases of academic research, HIRP ensures effective cooperation between Huawei and partners, allowing them to convert research findings quickly and efficiently into increased productive power. It is a model for collaborative innovation that benefits all participants.

- The HIRP Open project supports the ideation phase of the technological innovation process. It offers funding to a wide range of academic institutions for open research into new ideas. This in turn encourages innovative research in academia; it also helps to steer the research toward greater effectiveness and quality, by making industry projections and judgments one of the key research inputs. Researchers are encouraged to publish their theses and articles in the HIRP Journal, so that their achievements and new ideas can be widely understood and adopted.
- The HIRP Flagship project focuses on industrial applications of key technologies. Top scholars are invited to help address major technological challenges facing both the ICT industry and academics. With the benefit of long-term research funding and resources from both academia and industry, partners are able to make critical breakthroughs. The goal of producing breakthrough industrial applications inspires researchers to new levels of quality in their research and to faster advances in technology, and helps them quickly convert their findings into higher industrial productivity.

The first HIRP Flagship projects were launched in Europe (Germany and the UK) in 2010, because these projects perfectly matched the company's Europe strategy. Eleven funded projects were initiated with European institutions, including the University of Kaiserslautern, Technical University of Berlin, FAU, University of Cambridge, and University of Southampton.

HIRP has received nearly 100 research proposals from over thirty universities and research institutions in Germany, the UK, France, Finland, Switzerland, Sweden, Spain, Italy, and the Netherlands.

## IBM

### IBM Skills

IBM's priority for skills development in Europe is to align education and training programmes with the jobs that employers are offering. Our work with tens of thousands of students and teachers annually across Europe focuses on enhancing students' performance and engagement in STEM subjects, providing students with insights into STEM career paths, working with them to enhance employability, and strengthening teachers' knowledge of industry, jobs and skills.

### Industry-Education Partnerships for Skills in Europe

In Spain, IBM collaborates with the Madrid Regional Ministry of Education and the General Director of Innovation and Quality in Education to deliver a STEM Technology Camp for Teachers. Teachers are trained to code and to develop their project-based learning skills. Coding is now mandatory in Spain's secondary school computer science curriculum and IBM's course has been accredited by the Regional Government, ensuring all participants receive credits towards their professional development record.

In Germany, IBM has helped to develop an industry 4.0 bachelor course which will start in 2016. In cooperation with Duale Hochschule Stuttgart the course, combines an academic programme with workplace training. Students will learn and design the IT and business requirements to build a smart factory.

## Intel Corporation

### Intel Teach Program

Transforming education to meet the needs of today's learners requires ongoing support for teachers as they implement new teaching practices. Studies show that the quality of a teacher is the single largest influence on student achievement, and that the success of any educational change depends on a teacher's effectiveness in redesigning curricula, instruction, and assessments. The Intel® Teach program has been designed with these principles in mind. Delivered through unparalleled public-private partnerships with government ministries and teacher education institutions worldwide, Intel Teach is the largest program of its kind.

A proven program, Intel Teach helps K–12 teachers integrate technology effectively into classrooms and promote student-centred approaches, engaging students in learning and preparing them with critical skills for success in our digital world. With more than 15 million teachers trained in 70 countries, Intel Teach is the largest, most successful program of its kind.

## Oracle

Each year, Oracle Academy reaches more than 2.6 million students in 106 countries.

Oracle Academy's free program leverages Oracle's global technology leadership to offer a complete portfolio of computer science education resources to secondary schools; technical, vocational, and two-year colleges; and 4-year colleges and universities, with the goal of helping students become college and career ready.



To support continuous computer science learning at all levels, we make available a variety of free resources that can be used in the classroom and in not-for-profit academic course- and degree-related research, including technology, curriculum and courseware, student workshops, educator training, and Oracle industry certification and exam preparation materials.

Students develop IT and business skills while using production software used widely across hundreds of industries, and educators keep pace with current technology through ongoing professional development.

Oracle Academy's comprehensive curriculum offerings are created by professional educators and enable educational institutions to offer computer science course pathways lasting from one semester to three full years. Teacher and faculty training is delivered using a blended learning model that combines our hosted curriculum with classroom instruction, skill-building activities, and online assessments that provide immediate feedback.

Students engage in hands-on learning and develop skills in Java Programming, Database Design, SQL and/or PL/SQL along with career skills such as problem solving, collaboration, and critical thinking. The knowledge and practical skills students gain will help them advance their academic studies in computer science or enter the job market across industries.

Oracle Academy's courses Java Foundations and Database Foundations align to Oracle professional certifications, allowing students and faculty members to demonstrate your database and Java knowledge and skills with a distinction that is recognized by IT professionals industries.

Java Foundations Certified Junior Associate and the Oracle Database Foundations Certified Junior Associate credentials arm students with the fundamentals of Java programming and database conceptual knowledge.

The Junior Associate certifications are focused on students in secondary schools, two- and four- year colleges and universities who have participated in the Oracle Academy program and/or are studying computer science including relevant Java and database curricula and faculty members who teach foundational Java, database and computer science classes.

Computing isn't just for technology companies. All students, everywhere, need access to good computer science education to be ready for today's global digital economy. Oracle Academy delivers that, 100% free of charge.

## SAP

The [SAP University Alliances](#) programme is a key enabler for building the skills required to compete in the digital economy. SAP University Alliances is advancing digital curricula in schools and universities, incl. Industry 4.0 to prepare the future workforce for the digital enterprise, with a focus on the topics:

- Big Data and Data Science
- Design Thinking and Innovation
- User Experience
- Gamification and the use of simulations (e.g. the ERP Simulation Game)
- Industry trends (Industry 4.0, Internet of Things, the Business Network, ...)
- Technology trends (in-memory computing, cloud computing, ...)
- Business trends (digital business models, multi-channel ecommerce)

The SAP University Alliances programme is a global initiative that builds the next generation of talent for the digital enterprise and drives innovation from universities to the SAP ecosystem. At more than 2,400 institutions in 90 countries, SAP University Alliances works with faculty to develop highly qualified graduates with critical skills for the 21st century workforce.

[SAP CSR](#) aims to equip young people with skills to succeed by promote education and digital and entrepreneurial skills, providing technology donations and skilled volunteering by SAP employees, impacting overall 800.000 lives globally.

[OpenSAP](#) is an online platform which offers Massive Open Online Courses (MOOC) on Big Data, Cloud, IoT, Mobile applications development, as well as courses for teachers and trainers on programming which are free of charge (except for optional system access) and are offered in English.

### Academy Cube

[Academy Cube](#) is the platform that combines e-learnings with the job hunt. It has been developed by [leading global companies](#) such as SAP and CISCO to strengthen tomorrow's workforce and to open the door to new opportunities in the international labor market for motivated talents. Academy Cube connects students, graduates and professionals with companies and it could pave the way to your dream job. EU high tech and manufacturing companies seeking for STEM graduates with specific ICT skills are offering job placement to young unemployed academics with STEM university education background looking for jobs and additional trainings.

Academy Cube has 17.000 users and over 50 contributing partners including educational institutions. The platform is active in Germany, UK and is expanding in Europe and beyond. It aims to have 100,000 users at the end of 2017.

### Samsung

In 2013, Samsung launched a new global Corporate Citizenship strategy with a focus on Education, Employment, Health and the Environment. The driving force behind it is the belief that our people, products and services should contribute to a better society. In fact, this is one of Samsung's founding values.

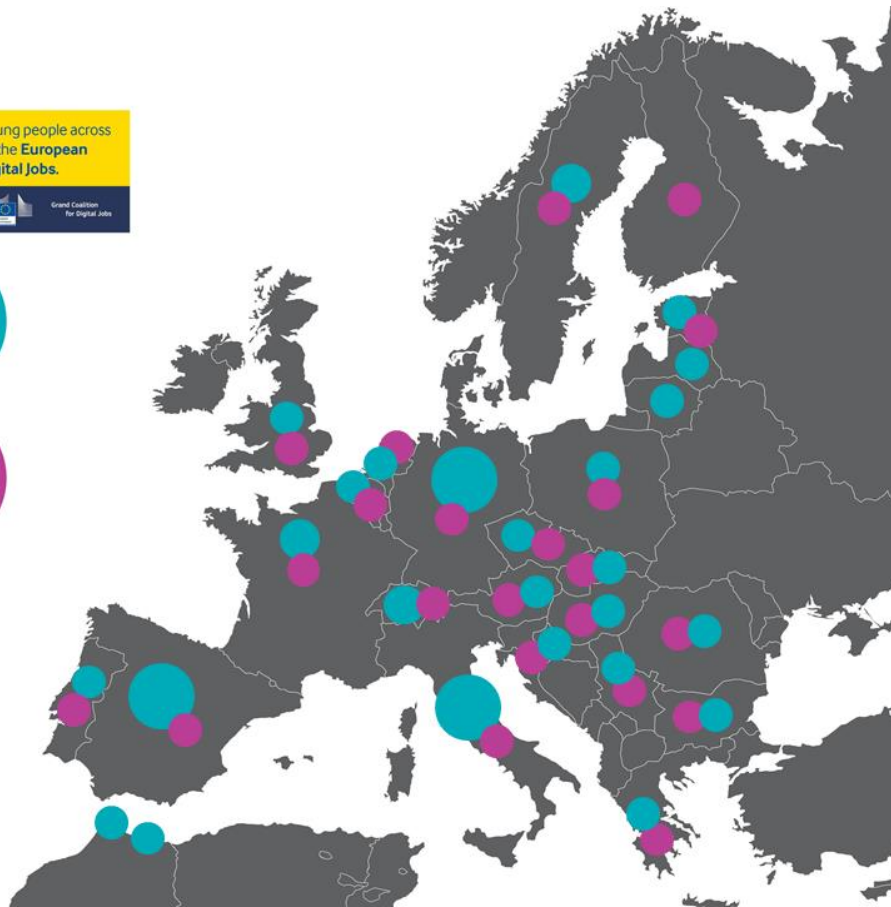
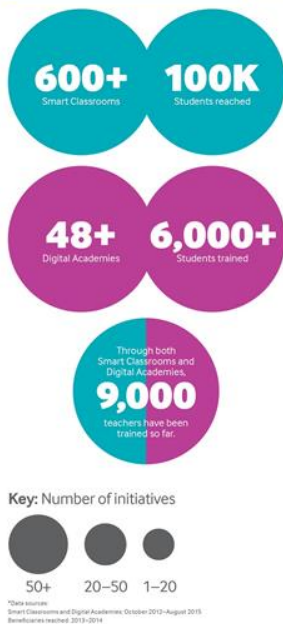
Our focus in the European region is primarily on Education and Employment. This is because two of the biggest challenges we face are high youth unemployment and a significant digital skills gap.

We have made a pledge to the European Commission's Grand Coalition for Digital Jobs that our Corporate Citizenship programmes will directly reach 400,000 young people by 2019.

We are a quarter of the way to achieving this target and are starting to see positive outcomes.

## EUROPEAN REACH

Our goal is to directly reach **400,000** young people across Europe by 2019. We've pledged this to the **European Commission's Grand Coalition for Digital Jobs**.



The skills gap poses a risk to both industry and society. By partnering with schools and universities, we are facilitating the learning of digital skills through two core programmes: **Smart Classrooms** and **Digital Academies**.

They are not only aimed at students, but also teachers, who often lack the confidence to adapt teaching practices in an increasingly digital world.

These programmes have been set up in each European subsidiary and are adapted to local needs.

### Smart Classrooms:

Through this programme we offer new learning opportunities for 6- to 16-year-olds. Most of them are in schools, but a number can be found in hospitals and museums. We do not just provide devices, we also offer educational content and teach digital skills, such as coding, to students and teachers. Since 2013, we have set up over 600 Smart Classroom initiatives across more than 20 European countries – directly engaging almost 100,000 students.

### Digital Creators:

We have initiatives across Europe that teach young people how to code and create their own digital content. They learn to be creators, not just consumers, of technology. The courses allow them to be resourceful and to learn by doing.

In an increasingly connected world, knowledge of coding is emerging as a new literacy.

Not everyone will become a digital creator in the future, but it can open many doors. Evidence shows that learning to code helps to develop 21st century competencies such as creativity, collaboration, logic and problem solving. In a knowledge economy, these skills are increasingly in demand.

### Teacher Training:

It goes without saying that teachers play a pivotal role in education. To address the digital skills shortage in Europe, they need both access to technology, and the knowledge and confidence to use it as a teaching tool.

With this in mind, Samsung runs teacher training programmes across Europe, aimed at both in-service teachers and pre-service teachers. We also run bespoke Professional Development Programmes with European Schoolnet, a network of European Ministries of Education.

We work together with teachers to develop scenarios and learning activities that use technology to evolve their pedagogy, and to support the transfer of digital skills in the classroom.

By the end of 2014, Samsung had facilitated training opportunities for over 9,000 teachers.

### Digital Academies:

Digital Academies are our targeted contribution to tackling the digital skills gap in Europe.

They offer 16- to 24-year-olds access to smart technology, ICT training and work-readiness programmes, to help them transition from education to work.

Across Europe, the Digital Academies offer a range of courses from app design to engineering and networking support.

Samsung provides access to technology, advises on the course development and, where necessary, supports the refurbishment of the learning space within the university or college.

Since 2013, 48 Digital Academy initiatives have been set up and over 6,000 students have attended courses.

### techUK

techUK's skills programme connects members with policy makers to address issues including; increased computing teaching across the national curriculum; improved career advice and entry points into the technology industry including apprenticeships; greater visibility and numbers of women in the industry; a strong yet beneficial migration policy; increase focus on life-long learning and the digital inclusion agenda.

Current projects include:

- Inputting to the Migration Advisory Committee [call for evidence: tier 2 reform](#)
- Engaging on [apprenticeship levy](#) developments
- Inputting to the [Home Affairs Committee inquiry on tier 2 reform](#)
- techUK members advising of industry needs for the [National College of Digital Skills](#), launching 2016 (ongoing)

Recent projects and public-facing activity include:

- [Roundtable discussion](#) on industry involvement with digital learning programmes, co-hosted by Wearedotdotdot
- [Roundtable with SMEs and the National College for Digital Skills](#) to input to the College's curriculum (June 2015)
- Major skills and migration recommendations in [Securing our Digital Future: the techUK manifesto for growth and jobs 2015-2020](#) (September 2014)
- [Evidence and recommendations submitted to influential Migration Advisory Committee in response to call on Shortage Occupation List](#) (December 2014)

techUK supported initiatives include:

- techUK supports [The Tech Partnership](#)
- [techUK's supports of Code Club](#) - getting industry working to help 8-14 years olds coding
- techuk is part of the [Digital Economy Council](#) Skills and Capabilities working group
- Julian David, CEO of techUK is on the [independent Digital Skills Review taskforce](#), led by Maggie Philbin

See also [the 11-step vision for building the nation's digital DNA](#).

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For more information please contact:  
Jonathan Murray, DIGITALEUROPE, Director  
+32 2 609 53 28 or Jonathan.Murray@digitaleurope.org

Patrice Chazerand, DIGITALEUROPE, Director  
+32 2 609 53 12 or Patrice.Chazerand@digitaleurope.org

## ABOUT DIGITALEUROPE

DIGITALEUROPE represents the digital technology industry in Europe. Our members include some of the world's largest IT, telecoms and consumer electronics companies and national associations from every part of Europe. DIGITALEUROPE wants European businesses and citizens to benefit fully from digital technologies and for Europe to grow, attract and sustain the world's best digital technology companies.

DIGITALEUROPE ensures industry participation in the development and implementation of EU policies. DIGITALEUROPE's members include 61 corporate members and 37 national trade associations from across Europe. Our website provides further information on our recent news and activities: <http://www.digitaleurope.org>

## DIGITALEUROPE MEMBERSHIP

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Alcatel-Lucent, AMD, Apple, BlackBerry, Bose, Brother, CA Technologies, Canon, Cassidian, Cisco, Dell, Epson, Ericsson, Fujitsu, Google, Hitachi, Hewlett Packard Enterprise, HP Inc., Huawei, IBM, Ingram Micro, Intel, iQor, JVC Kenwood Group, Konica Minolta, Kyocera, Lenovo, Lexmark, LG Electronics, Loewe, Microsoft, Mitsubishi Electric Europe, Motorola Solutions, NEC, Nokia, Nvidia, Océ, Oki, Oracle, Panasonic Europe, Philips, Pioneer, Qualcomm, Ricoh Europe PLC, Samsung, SAP, SAS, Schneider Electric IT Corporation, Sharp Electronics, Siemens, Sony, Swatch Group, Technicolor, Texas Instruments, Toshiba, TP Vision, VMware, Western Digital, Xerox, Zebra Technologies, ZTE Corporation.

### National Trade Associations

**Austria:** IOÖ  
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**Estonia:** ITL  
**Finland:** FFTI  
**France:** AFDEL, AFNUM, Force Numérique

**Germany:** BITKOM, ZVEI  
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**Poland:** KIGEIT, PIIT, ZIPSEE  
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**Romania:** ANIS, APDE TIC

**Slovakia:** ITAS  
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