Building and transforming skills for a digital world
“Digitisation is a very important driver for innovation and differentiation. It’s an opportunity for our employees to learn and acquire new skills. The “digital native” generation will have a key role in helping us accelerate the adoption of these profound changes in our day-to-day activities, whether in marketing, manufacturing or in the way we develop our talents.”

JEAN-PIERRE CLAMADIEU, Chairman of the Executive Committee and CEO of Solvay, and Chairman of the ERT Societal Changes Working Group.

INTRODUCTION

A new digital world

September 2017

The ongoing digitisation of society and business enables new ways of living, producing and consuming. Some speak of a Fourth Industrial Revolution as new technologies disrupt current business models and offer opportunities:

- Generating, storing and analysing large amounts of data has never been so easy in human history.
- Objects and even living beings can be connected to exchange information and to act in an “internet of things”.
- New high-speed fixed and mobile communication networks (e.g. 5G) enable a faster than ever exchange of data worldwide.
- New digital technologies, including hardware, open up a new world with tailor-made solutions (e.g. 3D manufacturing and prototyping).
- Cloud computing makes data easily accessible from anywhere in the world at a low cost.
- New platforms connecting providers and clients of services and goods are boosting and create added value in new ways.

To remain competitive in this global digital market and to maintain our overall welfare, European industry is shaping and converting to this new digital society.

The ERT Societal Changes Working Group has looked into the consequences of digitisation for industrial companies’ workforce. This publication highlights the Working Group’s conclusions. It shows how companies are adapting and makes suggestions for policies fit for boosting much required “digital skills”.
“Digitisation is transforming all industries. That is why digital skills should be conveyed at all levels and in all forms of education. Vocational education and training is particularly effective in this regard because there is a more direct link between education and employment. But we cannot stop there. The pace of change is so fast that learning must be lifelong.”

JOE KAESER, President and Chief Executive Officer of Siemens AG, and Chairman of the ERT Digital Single Market Working Group.
Digitisation increases productivity. The Boston Consulting Group estimates the impact of continued digitisation of industry on the productivity of Germany’s economy to be between 5% and 8% on average, which would lead to growth in employment of 6% in the coming 10 years 1.

Also, over the last 25 years, the ratio of employment to working age population has increased2, meaning that more people have a job. However, the job content has changed and keeps evolving3. The demand for abstract (high skills) and non-routine manual skills is increasing at the expense of routine tasks4.

The net impact of digitisation on the number of jobs is hard to predict and remains ambiguous due to the many unknowns: some jobs will disappear, while new ones will surface. The World Economic Forum5 predicts over the period 2015 till 2020 a net loss – at global level – of more than 5.1 million jobs due to disruptive labour market changes, which covers more than only digitisation. The highest losses are in the office and administrative job family, which is partly compensated by increases in the number of IT and technical jobs.

The European Centre for the Development of Vocational Training6 (CEDEFOP) takes a more positive view on the European labour market by 2020. It forecasts the creation of 8.5 million new knowledge and skills-intensive jobs7 – and 2 million more in elementary occupations8, while 4 million jobs will disappear, primarily in skilled manual work9. However, in practice, the automation of occupations, and by consequence their disappearance or transformation, depends on much more than only technical feasibility. Other factors are the cost to automate, the relative skills scarcity and the employment cost of workers who would otherwise have done the job. When deciding on automating a particular occupation, companies also look at other benefits of automation beyond labour cost substitution, as well as regulatory and social-acceptance3.

A focus on continuously developing the right skills and attitudes will however ensure people’s employability throughout their careers.

The impact of digitisation on the number of jobs: creation or destruction?

<table>
<thead>
<tr>
<th>Demand for skills – growth (%)</th>
<th>1995/98 – 2010</th>
<th>Average for D, E, F, I, NL, SV, UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT (HIGH-SKILL)</td>
<td>+21%</td>
<td>+9%</td>
</tr>
<tr>
<td>ROUTINE (MIDDLE-SKILL)</td>
<td>+9%</td>
<td>-19%</td>
</tr>
<tr>
<td>NON-Routine MANUAL (LOW-SKILL)</td>
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</tbody>
</table>


Siemens electronic works, Amberg – increasing productivity with a stable workforce

The Siemens Electronics Plant in Amberg (Germany) produces custom Programmable Logic Controls (PLCs) in a state-of-the-art “smart factory”. Real and virtual worlds are closely merged in production and products communicate with one another, optimising their own production process. Intelligent machines produce and distribute 950 products in more than 50,000 variants at only 12 defects per million.

Production is largely automated: machines and computers are responsible for 75 percent of the value chain. Yet humans remain indispensable – for developing products and production processes, for planning production or for handling unexpected incidents. Automation does not imply job losses: over the past ten years, the factory workforce remained stable – while productivity has multiplied.
Companies need to adapt to a changing reality to reap the full benefits of digitisation. Three trends in the field of HR push forward the digital company.

Redefining employer-employee relations

Digitisation has consequences for companies’ organisational structures. Digital platforms (e.g. Freelancer, Upwork, etc) facilitate connecting companies and service providers, so that the relationship between employers and employees has become more fluid. Companies are hiring less “own” employees and rely stronger on “external” expertise and workforce, which triggers a number of specific issues:

- External workers bring along new ways of doing things which may not be fully in line with a company’s current culture;
- More parties need to access information, which leads to changing views on the confidentiality of information as well as the need for open interfaces that enable linking;
- Managers need new ways to manage, assess and develop a mixed workforce (e.g. workload management);
- The social partners should seek suitable frameworks not only to safeguard the social rights of external workers, but also to maintain a level playing field in terms of social contributions between internal and external staff.

In short, new ways of co-operation need to be found between co-workers, managers, freelancers, service providers, etc. with significant effects on the legal frameworks governing such fields as, e.g., employment, mobility, diversity, social security, and the corporation.

A new way of working: co-operation and control

Digitisation blurs a company’s boundaries and requires different ways of looking at business’ structures. A UK study noted for example the rapid expansion of teleworking in recent years (see graph).

More flexible work arrangements trigger new questions on co-operation and control within and in-between teams. Workers need to find a balance between their professional and private life and need to come to a mutual understanding with their employer on their “choice to disconnect” in a flexible working regime.

The emergence of digital teams with members, who can be at whatever physical location, requires new job profiles such as the “community manager”. He is the catalyst of a digital community and ensures its dynamics while keeping an eye on the business goals.

Employers, employees and the legislator have to join forces to define a new framework for flexible and agile modes of co-operation.

HR management in the digital age: the challenges

Digitisation brings industrial activity back to Germany: the new Adidas Speedfactory

Adidas’ new pilot “Speedfactory” in Ansbach, Germany, uses intelligent robotic technology to produce high-performance sporting goods faster than ever before. The design and development of sporting goods are combined with an automated, decentralised and flexible manufacturing process. This flexibility opens doors to be much closer to the market and to where the customer is. The first concept shoes comprising 500 pairs of running footwear were revealed in 2016 with high-volume production for consumers set to increase throughout 2017. Adidas’ vision is to offer its customers a holistic high-tech experience, using revolutionary manufacturing technologies, in-store customisation and interactive digital experiences.

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Deutsche Telekom’s way to unleash “crowd intelligence”

In times of digitalisation, we increasingly face so-called “sticked problems”: complex and multi-layered tasks that one decision-maker, one expert or one team of experts alone cannot cope with. They require cooperation and collective knowledge – in short: crowd intelligence. Deutsche Telekom set up a corporate massive open online course for all employees group-wide (“Magenta MOOC”) – a virtual collaboration format with specific input from academic and company experts to tackle real “business challenges”. Among all employees who registered for the “Magenta MOOC”, i.e. the corporate massive open online course of Deutsche Telekom, 1,000 participants were divided into 200 teams of five, each working on a solution for a business challenge provided by respective business leaders. Challenges included e.g. the “Connected Car”, “Internet of Things”, “Beacons” and “Leaders as role model in the digital age” – all relevant digitisation issues for Deutsche Telekom.

How Iberdrola upgraded the skills of electricity networks workforce

The STAR Project (Network Remote Management and Automation System) is an ambitious initiative of the Iberdrola Group that aims to transform technology in the field of smart grids. This project, which represents a total investment by the company in Spain of more than 2 billion euros, will be completed in 2018. Over 11 million electricity meters will be replaced and around 80,000 transformer centres will be adapted.

So far more than 9.5 million smart meters have been deployed, which required current installers/controllers and other networks employees to be re-trained. The programme started 7 years ago and up to 2,300 people have been trained for new networks. Only in 2016, more than 900 employees received 11,000 hours of training.

SAP’s “Autism at Work”

The groundbreaking SAP “Autism at Work” programme integrates people with autism into the workforce. Our goal is to have 1% of the SAP workforce represented by people on the autism spectrum. This way, we are able to capture the innate abilities that are often associated with people on the autism spectrum. They can bring unique skills and competencies to a company, particularly in specialised IT tasks, while simultaneously securing a meaningful employment. The initiative currently includes over 100 colleagues and is active in Argentina, Australia, Brazil, Canada, the Czech Republic, Germany, India, Ireland and the United States, with plans to add China and Mexico in 2017.

Changing skills requirements

The digital transformation requires “digital skills”, which should not be confused with pure “ICT” skills. Digital skills are those skills that are required in a digital society and cover a wide variety of fields, also outside the IT domain, such as engineering.

Changes in skills requirements can be spotted in 3 areas which are elaborated in the next chapter:

- Basic digital skills to be acquired by every member of the workforce and, in fact, of society (e.g. digital-load management, virtual collaboration, etc.).
- New domain know-how to be developed – mostly in technical functions (e.g. additive manufacturing or artificial intelligence).
- Existing domain know-how to be updated (e.g. new business models and methodologies boosted by big-data analytics or predictive maintenance).

Digitisation and the large demand for digital skills are opportunities for creating new jobs, if people are taught the right skills. For example, in a survey amongst 81 executives from all over the world 65% CIOs: 73% claim that big data analytics is important for the digital transformation of the company, but only 39% claim to possess the necessary skills.

Interestingly, digital jobs may be more easily accessible for people with specific disabilities, as is proven by the SAP Autum at Work programme.

Example: Demand for ICT professionals will exceed their availability on the job market.

Unless adequate action is taken, 756,000 ICT jobs will remain unfilled by 2020

<table>
<thead>
<tr>
<th>Year</th>
<th>Jobs in millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>7.0</td>
</tr>
<tr>
<td>2015</td>
<td>7.5</td>
</tr>
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<td>2016</td>
<td>8.0</td>
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<td>2017</td>
<td>8.5</td>
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<tr>
<td>2018</td>
<td>9.0</td>
</tr>
<tr>
<td>2019</td>
<td>9.5</td>
</tr>
<tr>
<td>2020</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Source: Empirica (http://eskills-lead.eu/fileadmin/lead/brochure-lead/working_paper_-_supply_demand_forecast_2015_a.pdf)
Future skills needs in industry: defining a digital skills competence model

- Basic digital literacy to work in a digital environment – this includes the management of digital information, communicating, content creation, safety and security, problem-solving;
- Domain know-how where deep expertise is required – these can vary by industry, but prevalent ones include cloud computing, additive manufacturing, privacy/security, data analytics, digital marketing and developing new business models;
- Mindset and behaviours (transversal skills) required to succeed in a digital environment – these include dealing with complexity, working in an agile way, creativity and the attitude of life-long learning.

**Basic digital literacy**
- Information treatment
- Digital communication
- Digital content-creation
- Safety
- Problem-solving (digital solutions)

**Technical skills (domain know-how)**
- Cloud computing
- Additive manufacturing
- Digital twinning
- Privacy / security
- Data analytics
- Digital marketing
- New business models

**Mindset and behaviours (transversal skills)**
- Dealing with complexity
- Working in an agile way
- Creativity
- Lifelong learning

Predicting future skills needs at a cross-industry level is often hard. The model on the right hand side shows the various critical digital competencies required in industry. Employees entering the workforce as well as those being re-trained within the workforce will need a range of expertise across the 3 areas below. Education providers may use this model as a reference to update their curriculum.
Teaching “digital skills”: preparing for the future

The digitisation of the economy is proceeding fast. The lifetime of specific digital skills is thus short and requires constant updating. Only with a strong emphasis on lifelong learning, Europe can take the full benefits of digitisation. Lifelong learning requires a view on the entire learning process: from having the right quality and quantity of skills when entering the labour market, to maintaining employability by regularly updating skills or by changing to a new field with better job opportunities.

With the Digital Skills and Jobs Coalition, the Commission has recognised the role of business in building skills for Europe’s future and is encouraging Member States to develop comprehensive national digital skills strategies.

This section provides recommendations on how governments can make our education system better fit for the future and how companies update their workforces’ skills.

Teaching digital skills in schools and institutions

Adult learning: encourage initiatives supporting the continuous re-skilling of experienced professionals along their career.

Companies often have their own re-skilling programmes. However, in particular SMEs or in case of exceptional situations (e.g. large-scale lay-off), specific government programmes are required.

Need for innovative STEM and ICT training initiatives for adults.

Specific ICT training courses can address short-term qualification needs and help unemployed people in particular to find a job. Governments should support such initiatives, for example by providing public funding for training platforms and IT training vouchers for unemployed talents.

Governments must continue promoting ICT, STEM† and the spirit of entrepreneurship as essential parts of their overall education system.

No student should leave school without a basic set of STEM and ICT skills as these are essential to operate and function in a fully digitised information society. Member States must develop and implement national STEM and ICT skills strategies which may include setting national targets.

Promote a positive image of STEM and ICT – in particular directed towards girls and women.

STEM and ICT-related professions are still perceived as unattractive by many young talents. All stakeholders should join forces to promote STEM and ICT as a rewarding domain with exciting career perspectives for men and women.

The digital transformation of industry and society requires checking curricula to identify the need for additional or revised content.

Some examples include the introduction of coding in primary school, entrepreneurship education in secondary school, additive manufacturing in vocational training, and cyber-physical systems in tertiary technology curricula. Although domain-specific knowledge is crucial, also management courses need updating. They should cover, for example, data-driven decision-making and other aspects of disruptive business modelling.

Add more inter-disciplinary modes of learning, allow more experimental formats, and embrace user-generated content.

Some institutions, such as the Aalto University in Finland, managed to come to a multidisciplinary programme, combining different fields of research and finding synergies (see box). We need more experimental formats, such as a “hackathon”14, where participants have to complete a development task in just one day of short sprints and iterations, a format often used for cross-functional teams within tech companies.

On 1 January 2010, Aalto University started operating in Finland as a new innovative university merging science and technology, design and art, as well as business and economics. Multidisciplinarity is at the heart of the new university. A glimpse at their website shows what this means in practice:

- Adding Arts to STEM to become STEAM in Enchanting mathematics: a revolutionary course called “Crystal flowers in halls of mirrors” ties together mathematics and art in an inspiring way.
- Co-creative Entrepreneurship Education provides Aalto students with the inspiration, capability and network necessary to build new scalable businesses.
- Design Factory, Health Factory and Media Factory act as joint platforms combining expertise in product development, health and well-being, and media. The Factories are designed to facilitate new forms of collaboration in an environment where academic teams, researchers and students work together with companies and communities.

SAP taps into bright young minds for innovation for the digital world

SAP University Alliances launched SAP Next-Gen to accelerate the impact of its global academic innovation network of 3,100+ educational institutions. SAP Next-Gen is an open innovation platform connecting students, researchers, thought leaders, start-ups and accelerators with corporate and venture capitalists to seed in disruptive innovation and to accelerate the digital transformation and future of the economy. Through SAP Next-Gen projects, bright young minds engage with industry partners to work on real life challenges, applying design thinking, business model innovation methodologies, as well as the latest SAP and partner technologies to accelerate innovation.
Open up education systems to better interact with business and other areas of society such as, for example, the public sector. Such an exchange is especially relevant when it comes to defining and aligning curricula with the fast pace of digitisation, career counselling or the delivery of work-based education and training.

Employers are also good in delivering education and training, from quality internships via work-based vocational education and training (VET) to lifelong in-company learning programmes. These embedded formats are best in creating or maintaining employability because they combine theoretical learning with real-world application. Member States should introduce and promote apprenticeships and higher VET as public-private partnerships and support employers in ramping up the work-based components.

The education sector must become more digital and agile. The pace of digitisation requires not only a smooth process for regularly updating and revising curricula, but schools and universities should also have access to digital technologies and concepts, for example by sharing resources in so-called “makerspaces”.

Makerspaces are a good ground for breeding new companies and for stimulating entrepreneurship (e.g. by providing tools for building prototypes).

Teach the teachers: introduce an element of digital training in teachers’ education. Only when teachers feel sufficiently comfortable and have access to digital technologies are they capable of passing on their knowledge and enthusiasm to their students.

Digital technologies also change the teaching profession. Students can learn and choose courses online (e.g. Massive Open Online Courses (MOOCs) for higher education). A teacher will also guide students towards the most relevant online material and stimulate exchange of experiences in a classroom context.

Raise awareness of future and new job profiles. Governments, business and research centres should co-operate to identify early on new digital job profiles and the associated skills sets. The outcomes should be promoted via a dedicated pan-European and cross-industry campaign, leading to the required changes in university curricula and occupational standards.

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**The Junior Engineer Academy of Deutsche Telekom Stiftung**

The “Junior Engineer Academy” is a German school network of 88 secondary schools that have established a two year engineering programme in cooperation with companies and higher education institutions. The programme shows that digital skills are key in engineering today and illustrates the importance of cooperative, project-oriented work. The network is currently setting up partnerships with schools in Central, Eastern and SouthEastern Europe, where the students jointly design and execute technology projects.

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**Bizdirect (Sonae) partners with a Polytechnic Institute**

Bizdirect, a tech company part of the Sonae group, has established a partnership with a polytechnic institute and a local government in Portugal to launch a “Competence Centre of Innovation and Development” focused on Microsoft technologies. New graduates develop their ICT skills in Microsoft technologies and participate in major international projects while still remaining in a local environment. Graduates participating in the programme receive a certification of “Microsoft technology professional”.

So far, four technical academies have been launched. Four more academies are in the pipeline for 2017, focussing on Digital Business, Customer Experience, Data Analytics and Internet of Things.

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**Bizideas**

The impact of digitisation on the number of jobs: creation or destruction?

HR management in the digital age: the challenges

Future skills needs in industry: defining a digital skills competence model

Teaching “digital skills”: preparing for the future

Glossary

Members
Companies upgrade the skills of their workforce

The digital transformation in industry requires new skills from the current and future workforce. Companies are defining the digital competence model that is relevant for their business. Lifelong learning, as well as a positive attitude towards complexity (methodological thinking), flexibility and creativity will become even more important to ensure employability.

In times of technological or structural shifts in industry and the labour markets, certain skills sets may become obsolete and new skills will be required. In these situations government intervention is needed so that workers can be re-skilled.

Companies are contributing to lifelong learning and have set up several initiatives.

Companies make their own digital learning programmes, but the role of a company’s training department is changing: from creator to curator.

A company professional in skills development put it this way: “We were used to make the trainings ourselves, while now we have to assist people in selecting the appropriate ones which are digitally available.” Even more than creating their company’s skills development programmes, they have to manage a portfolio of online trainings and guide people through them.

Digitalisation disrupts everything – including the way in which we acquire new skills. At SIEMENS, the learning organisation has to face ever faster innovation cycles and with “competition” from the internet. Furthermore, digital skills are horizontal, i.e., they cut across occupations or job families. To teach employees to be more agile, the learning organisation has to become agile itself. Platforms and formats have become more open: curated rather than created content, focus on experimental learning, more applied and interdisciplinary learning on the job, business impulse or rapid-prototyping events. In many formats, the learning outcome is unknown at the outset – a perfect simulation of today’s business journeys. In this way, learning has become a key driver of the digital transformation within Siemens.

VODAFONE has also shifted its learning culture from one where learning was frequently completed in a classroom to one where 90% of learning is done digitally. A new integrated digital learning platform enabled all 130,000 employees to take learning at any time, on any device on a range of business, management and technical training. Best practices are shared via video on apps and new products are experienced with the use of virtual reality technology. Learning is relevant, fun and often gamified, with learners competing against one another and gaining badges for completion of learning levels.

TELEFÓNICA focuses on developing more digital and transformational employees through its advanced learning and development corporate offers. The “Change the Game” Learning Hub, powered by a human resources information system, is a one stop shop to access everything that has to do with learning and development in Telefónica (e.g. corporate university content, MOOCs Factory, mentoring tools including reverse and start-up related techniques, etc.) It pushes content curation over creation and applies an “everything under one umbrella” approach.

Nokia combines university-industry co-creation and training students to develop a digitally skilled and entrepreneurial workforce

Out of Nokia’s traditionally early and intensive involvement with universities and high schools, the “Demola” concept was born in 2008, which Nokia then helped to establish. Demola consists in setting up multidisciplinary teams of creative students of all areas (business, ICT, technology, engineering, design, etc.) to solve real life industry challenges, Nokia and other industry partner companies bring to them. The teams test ideas and develop service and product concepts.

Demola has since become an engine to set up innovation ecosystems at 54 universities in 13 countries with 700+ innovation partners of which many ERT Member companies.

For more: www.demola.net

Companies transform into digital enterprises.

NOKIA, for example, is driving a digitisation agenda, based on a digital vision built on four pillars: the Digital Company, the Digital Customer, the Digital Enterprise and the Digital Employee – which are enabled by a transversal digital platform. Nokia’s internal operations will be digitised, run on smart devices and use automation, robotics, cognitive learning and artificial intelligence. The workforce will evolve to become more ‘fluid’ and more remote, allowing for seamless internal and external collaboration and increase the usage of flexible teams.
Companies take action to identify and improve the digital skill level of their workforce.

In-company learning processes and experiences are upgraded and digitised to take full advantage of the digital transformation. Methodologies are being developed and deployed to assess someone’s digital skills level.

**TELEFÓNICA** for example, created an aspirational profile for its leaders, the Digital Transformative Profile to be better prepared for the challenges ahead. The framework has three dimensions:

- Learning agility, or the capacity to better answer to current challenges based on previous experiences;
- Transformative competencies, or the capacity to lead in times of change;
- Embracing technologies, or the capacity to incorporate new technologies and its advantages in day to day responsibilities.

Telefónica has assessed more than 3,300 of its leaders by means of this model and could in this way identify specific training needs and propose a targeted global learning and development offer.

**NESTLÉ’s** “Lead others in the cloud” proves that leadership development can be efficiently and effectively managed on digital on-line platforms.

“Leading others” is an highly engaging 6 week self-paced learning journey addressed to 45 first-time managers and includes peer to peer learning, inspirational videos, business and individual assignments, virtual coaching and mentoring. From 2017, it will be offered 5 times per year to more than 400 people, complementing (and replacing) mentoring. From 2017, it will be offered 5 times per year to more than 400 people, complementing (and replacing) mentoring.

**ORANGE**’s “Inside” programme is a coaching tool available to the workforce, while personal efforts to upgrade skills are recognised and promoted. Orange’s “Digital Leadership Inside” programme consists of three parts:

- **Making digital equipment available to the workforce** (e.g. hardware, etc.) to try out.
- **Complementary training programme** with virtual online courses (CODC) directly related to people’s jobs and the required skills (e.g. digital HR engineer);
- **Personal digital ‘Ninja’** - a mentoring system, which supports each employee in building a personalized digital footprint.

Some workers, especially older ones, may need specific attention if they are less used to digital technologies in their private life.

Companies create a positive environment for lifelong learning, in particular for developing digital skills.

Some workers, especially older ones, may need specific attention if they are less used to digital technologies in their private life.

Companies’ challenge their business model and leave room for disruptive models.

PEOPLE with innovative ideas get room to challenge current business models. Out-of-the-box thinking sharpens the current business model.

IBERDROLA asked a group of 26 young employees from different areas and counties to work on defining the company’s vision for the digital world and to develop associated products and services that can be part of Iberdrola’s portfolio. They get total freedom, without hierarchies, without restrictions and without previous conditions so that they can brainstorm on new products such as super-connected homes, new energy platforms or solar airplanes. An example of the output of these initiatives is the launch of “PowerUp,” a completely new way for consumers to buy and manage their energy, as it is bought based on the number of “days energy”, which makes it easier for consumers to understand the amount of energy they consume. As it is app-based, it allows customers to manage their account, make energy purchases and enter meter readings online and on the move.

Air Liquide’s Digital Fabs to deliver digital solutions

To implement its digital transformation strategy, Air Liquide has set up five “Digital fabs” on a selected number of topics transforming Air Liquide’s core business. They bring together people and skills from across the Air Liquide Group to design and build digital solutions and an operating model at Group level, while accelerating time to market. The agile and multidisciplinary “fab team” is empowered by the Group to be a one-stop shop for all business stakeholders and is accountable to manage resources to deliver digital solutions that are scalable, safe-by-design, customer-centric and “operation-ready.”

At ORANGE, new technologies are made available to the workforce, while personal efforts to upgrade skills are recognised and promoted. Orange’s “Digital Leadership Inside” programme consists of three parts:

- Raising awareness on digital by introducing a system of “digital passports”: employees get familiar with a certain issue (social media, big data, community management, etc.) by following a digital module, which takes about 2 hours. If they successfully pass the test they are rewarded with an “icon” that can be put in people’s signature, and people get access to more benefits and courses. In total 100,000 out of 160,000 employees get a “digital passport”;
- A competence training programme with corporate online courses (CODC) directly related to people’s jobs and the required skills (e.g. digital HR engineer); and
- Making digital equipment available to the workforce (e.g. hardware, etc.) to try out.

The SONAE GROUP has been deploying many resources in order to lead the digital transformation of its businesses. On this ground, the group invites company and external experts on digital issues to challenge and train its employees. The motto is that each employee can be a digital ambassador within the company to explore and promote the potential of digital in the business. These open sessions (also available online) embrace issues such as Artificial Intelligence, Robotics, Virtual Reality and Technological Disruption.

Some workers, especially older ones, may need specific attention if they are less used to digital technologies in their private life.

When it comes to learning how to work more digitally, key groups of people like senior managers and older workers benefit from being paired with their own personal ‘Digital Ninja’ at VODAFONE. Their Ninja is usually a graduate who spends time mentoring their partner on a range of digital ways of working. From how to use social media and cloud storage through to what apps to use to help with personal productivity. Mentoring normally lasts for 3-6 months. The response from those being mentored was fantastic, with many senior leaders proudly posting pictures with their Ninjas on their newly set up social media posts, whilst ensuring that those key groups are more comfortable and productive with their digital tools and ways of working.

Apprentices and trainees participating in NESTLÉ’s YOUth network in Switzerland have an extended role in helping managers to feel comfortable with new technologies – such as moving from physical phones to Skype calls or inputting their own expenses on computers. Also when moving from old-style offices to digital workplaces, these young people spend 1 or 2 days with all managers from the team to help them set up their new digital environment. We want to deploy this network in all countries. Young people also gain from this in terms of visibility with senior leaders or in improving their communication or soft skills.

Companies challenge their business model and leave room for disruptive models.

People with innovative ideas get room to challenge current business models. Out-of-the-box thinking sharpens the current business model.
Glossary

Members

Chairman
Benoit Potier
Air Liquide

Vice-Chairman
Vittorio Colao
Vodafone Group

Members

José María Álvarez-Pallete
Telefónica
Jean-Paul Agon
L’Oréal
Paulo Azvedo
Sonae
Ben van Beurden
Royal Dutch Shell
Kurt Back
BASF
Jean-François van Boxmeer
HENKERS
Carlo Boszotti
STMicerelectronics
Svein Richard Brandtzæg
Norsk hydro
Paul Bulcke
Nestlé
Pierre-André de Chalendar
Saint-Gobain
Jean-Pierre Clamadieu
Solvay
Iain Conn
Centrica
Ian Davis
Rolls-Royce
Rodolfo De Benedetti
CIR
Volkmar Denner
Robert Bosch
Claudio Descalzi
Eni
Wolfgang Eder
voestalpine
Henrik Ehrnrooth
KONE
John Elkann
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Christoph Franz
F. Hoffmann-La Roche
Ignacio S. Galán
Iberdrola
Moya Greene
Royal Mail Group
Timotheus Hottges
Deutsche Telekom
Paul Hermelin
Capgemini
Zosil Herradí
MOL
Hinrich Hiesinger
thyssenkrupp
Frans van Houten
Royal Philips
Pablo Isla
Inditex
Leif Johannson
Ericsson
Joe Kaeser
Siemens
Isabelle Kocher
ENGI
Bruno Lafont
L’Air Liquide
Thomas Leyssen
Unicore
Martin Lundstedt
Volvo Group
Bill McDermott
SAP
Nancy McKinstry
Wolters Kluwer
Lakshmi M. Mittal
ArcelorMittal
Dimrit Papalexopoulos
Titan Cement

7. Legislators, managers, professionals & technicians
8. Labourers
9. Agricultural, craft and trade workers, machine operators
13. ICT: Information and Communication Technology
14. Hackathon (synonyms: a hack day, hackfest or codefest): a design sprint-like event in which computer programmers and others involved in software development, including graphic designers, interface designers, project managers and others, often including subject-matter-experts, collaborate intensively on software projects. (Source: Wikipedia)
15. Makerspaces (synonyms: Hackerspaces, FabLabs): a local and shared manufacturing environment, where machines and associated training are accessible for everyone, from 3D printing to laser cutting and welding. It relates to all materials like metal, paper, wood, fabric, plastic and gives anyone all relevant capabilities and resources to design and build physical objects, prototypes or even small batches of a final product. Pushed by societal and environmental challenges and made possible by new software and hardware technologies.
16. MOOC (Massive Open Online Courses): an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials such as filmed lectures, readings, and problem sets, many MOOCs provide interactive user forums to support community interactions among students, professors, and teaching assistants. (Source: Wikipedia)
17. Hadoop: a framework that allows for the distributed processing of large data sets across clusters of computers using simple programming models. (Source: http://hadoop.apache.org/)

INTRODUCTION
A new digital world

KEY MESSAGES
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HR management in the digital age: the challenges

Future skills needs in industry: defining a digital skills competence model

Teaching “digital skills”: preparing for the future

Glossary

Members