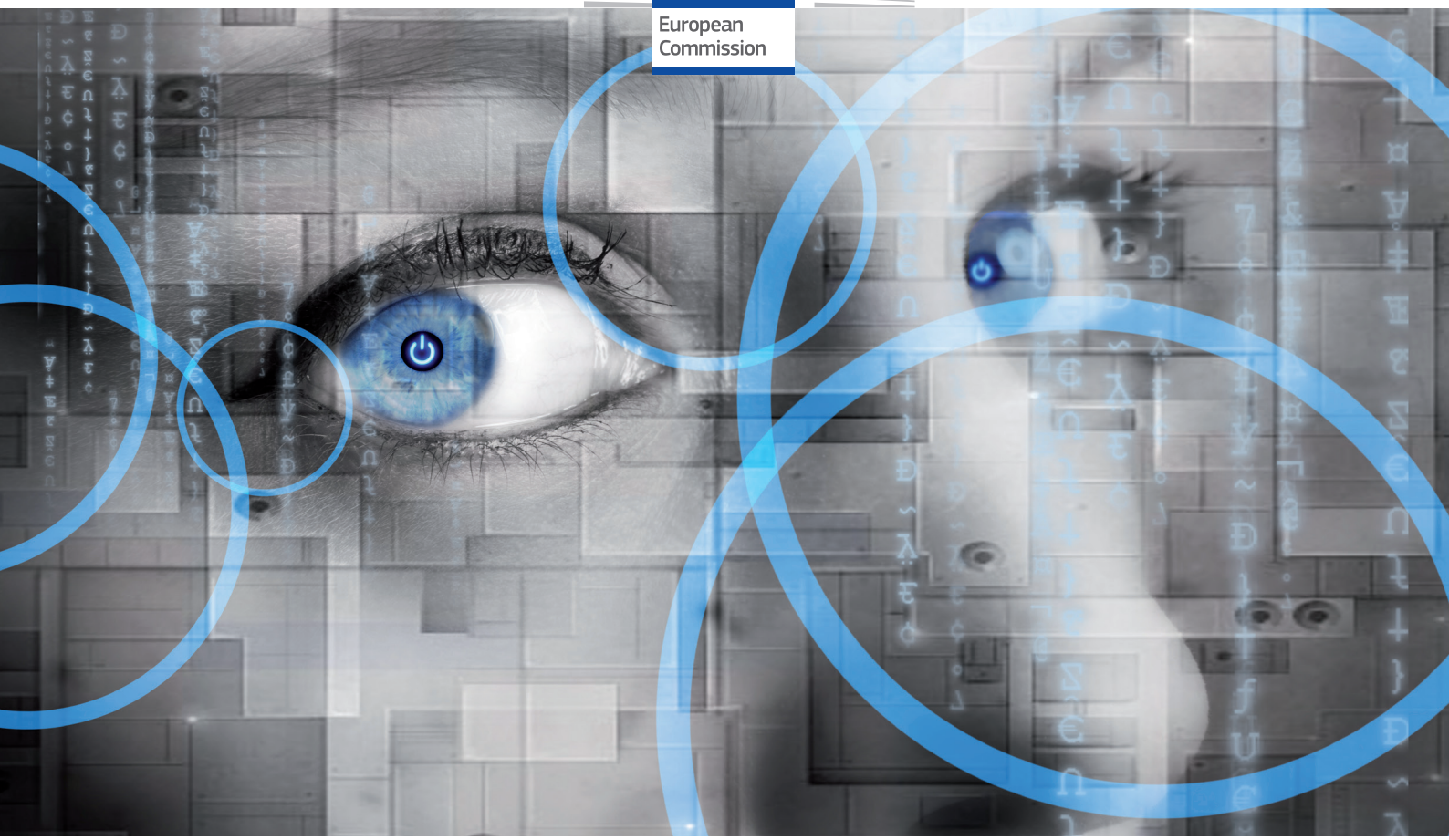
European Commission



e-Leadership

Digital Skills for SMEs

www.eskills-lead.eu

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Foreword

For Europe to compete, grow and generate jobs, we must ensure that we have the people who can lead the digital innovation and transformation of our industries. New technologies are a key engine for growth fuelled by the ideas of highly-skilled professionals and business leaders (e-leaders). Shortages are estimated to reach over 800,000 for digital professionals and 200,000 for e-leaders by 2020. Last May the European Commission launched a Digital Single Market strategy. Once implemented, the Digital Single Market could contribute over € 415 billion per year to the European economy.

E-leadership is a key component of the Digital Single Market Strategy's drive to foster digital skills needed for the modern European industry. The stakeholders are calling on Member States to increase their support to the development of e-leadership skills. The European Strategic Policy Forum on Digital Entrepreneurship recommended that e-leadership skills content should be a part of management training and educational programmes for business leaders and senior public officials. There is a broad agreement about the necessity of a joint Europe-wide effort to supply e-leadership skills across all sectors and enterprises.

This document provides a summary of the state-of-the art of e-leadership skills development in Europe and concrete examples of best practices and implementation of pan-European guidelines developed by industry and academia. Future editions will address leadership skills requirements in businesses exploiting digital and key enabling technologies including the latest advanced manufacturing technologies.

Enjoy the reading!

Lowri Evans
Director General
DG Internal Market, Industry,
Entrepreneurship and SMEs
European Commission

e-Leadership - A key ingredient to foster Europe's competitiveness and innovation potential

e-Leadership is of crucial importance for companies and industry to excel in their business operation. e-Leadership is key to using new digital technologies for innovation and transformation, managed in a relevant organisational context and embedded in the business strategy. e-Leadership skills are the skills required of an individual to initiate and achieve digital innovation:

- Strategic Leadership: Lead inter-disciplinary staff, and influence stakeholders across boundaries (functional, geographic)
- Business Savvy: Innovate business and operating models, delivering value to organisations
- Digital Savvy: Envision and drive change for business performance, exploiting digital technology trends as innovation opportunities.

e-Leadership in Europe - Actions taken

The EU e-skills strategy, based on the European Commission's Communication, ‚e-Skills for the 21st Century: Fostering Competitiveness, Growth and Jobs' (2007), has been a major component of the drive to boost competitiveness, productivity and innovation capability of European enterprises. It helps to improve framework conditions for innovation, growth and new digital jobs, and recommends that the knowledge, skills, competences, and inventiveness of the workforce are constantly updated through effective lifelong learning. In 2013, the European Commission launched a „Grand Coalition for Digital Jobs" to intensify and accelerate the efforts to fill the digital skills gap.

e-Leadership Skills triangle

In this context, the European Commission has launched a dedicated e-leadership skills initiative, welcomed and supported by stakeholders. It started in 2013 with a focus on large enterprises and was broadened in 2014 to include small and medium sized enterprises, gazelles and start-ups. The initiative will be scaled up in 2016.

The European Commission has also launched the Startup Europe initiative, which looks at the resources that entrepreneurs need - like venture capital and accelerators - and aims to strengthen the business environment for web and ICT entrepreneurs so that their ideas and business can grow. It has already held the 'Startup Europe

Panels with high-level experts discussed key issues on e-leadership

Jan Muehlfeit, Global Strategist |Coach |Mentor guided the day's debates as the chairperson

Charlotte Holloway, Head of Policy, techUK spoke on e-Leadership: Views from a Demand Perspective

The e-leadership skills topic is integral to digital entrepreneurship policies and activities.

In particular, the report on „the digital transformation of European industry and enterprises" (March 2015) of the „European Policy Forum on Digital Entrepreneurship" recommends further promotion of digital leadership, and urges building e-leadership skills content into all general management training and educational programmes for business leaders and senior public officials.

Comes to Silicon Valley' event when EU tech firms, investors and policymakers from both sides of the Atlantic got together for a week in the U.S. to share ideas.

On 6 May 2015 the European Commission adopted the Communication 'A Digital Single Market for Europe', which includes 16 initiatives to lay the groundwork for Europe's digital future. The text explicitly recognises the critical importance of digital skills and IT professionalism.

Gary Kildare, Chief HR Officer, IBM Corporation Europe provided the perspective of a global IT and Services company

Silvia Leal, Academic Director at IE Business School, Madrid speaking about the e-Leadership Programme Portfolio of IE Business School for Executives, SMEs and start-ups

Philippe Trichet, Digital Expert Director, The Boston Consulting Group, speaking on Agile Leadership: Five Imperatives for Navigating Digital

The European Conference on Digital and Key Enabling Technologies Skills (1st and 2nd June 2015 in Brussels, see: www.leadership2015.eu) brought together over 300 participants from government, academia and industry to discuss developments in skills for e-leadership and key enabling technologies.

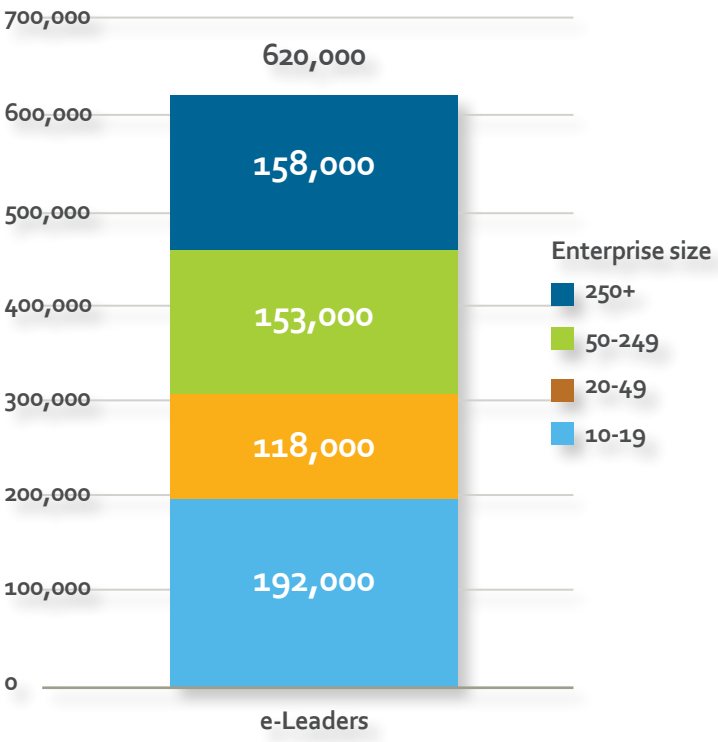
Prof. Peter Kelly from Aalto University speaking about the Practice of High Growth Entrepreneurship

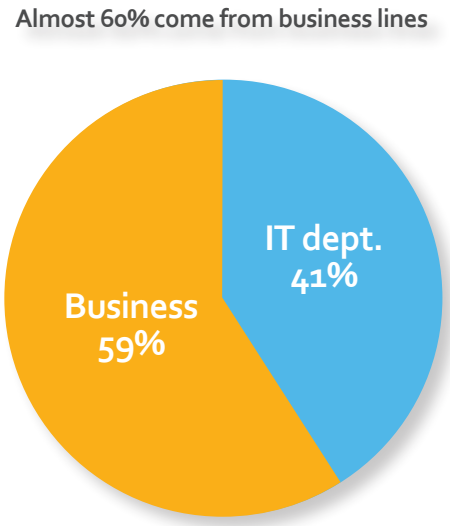
Forecasting demand - Europe needs over 40,000 new e-Leaders per year until 2020

Demand is growing throughout European industry to improve the quality of e-leadership. Although no official statistics exist to date regarding the demand or supply of e-Leadership skills, innovative e-leadership positions in Europe are estimated to be around 620,000 e-Leaders in

2015, more than half in business units in companies, rather than from IT departments. This estimate includes those who have the idea and develop innovative IT projects in organisations - not all them likely to yet encompass the full skill set needed to become a successful e-leader.

Quantification of potential e-Leadership Positions in Europe 2015



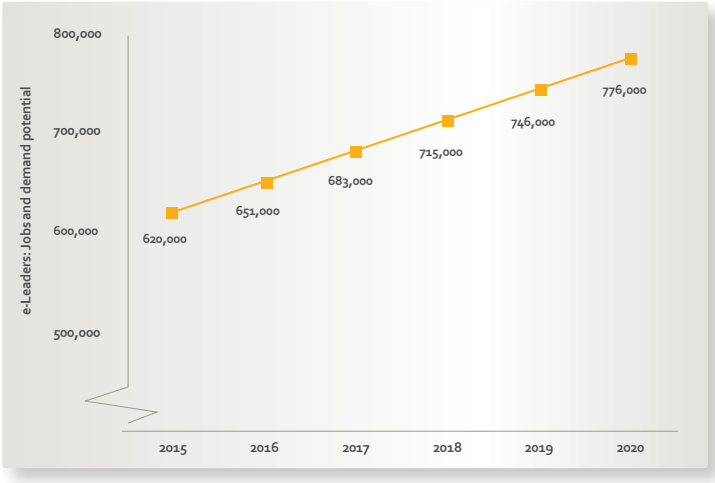


Source: empirica, Survey NL, UK, DE 2013. Data for EU, extrapolated to 2015 and grossed up using Structural Business Statistics (Eurostat)

In forecasting e-leadership demand, we rely on estimated growth rates in analogy to the most highly skilled IT positions, for which such estimations exist . We expect e-leadership demand to rise by an average 4.6% until 2020, when demand is estimated to reach 776,000.

Taking account of expansion and replacement demand, Europe will therefore need 200,000-250,000 additional e-leaders by 2020, or 40,000-50,000 per year. The data behind these estimates is augmented by a collection of e-Leadership "eco-system" data linked with the demand or supply of e-Leadership skills through the e-Leadership scoreboard.

e-Leadership forecast for Europe (EU28) 2015 – 2020



Source: empirica 2015

e-Leadership at a glance – European scoreboard

The e-leadership scoreboard monitors progress in e-leadership skills development, covering areas of the e-leadership eco-system including:

- e-Leadership education,
- Quantity of the workforce with e-leadership potential
- Structural variables enabling the exploitation opportunities of e-leadership, and
- e-Leadership enabling policies or other driving mechanisms.

The scoreboard uses indicators from primary and secondary sources. It compares the e-leadership "performance" of EU Member States and identifies relative strengths and weaknesses of e-leadership eco-systems between countries, so as to inform policy discussion at national and EU level.

The scoreboard model measures the factors likely to affect demand and supply for e-leadership skills in each country. It provides insights into how countries perform in distinct e-leadership domains that translate into abilities to exploit innovation opportunities for business growth, and suggests avenues for future activity.

In total 24 indicators are organised in four dimensions, and divided into several building blocks.

Philippe Trichet
Digital Expert Director, THE BOSTON CONSULTING GROUP

Digital talent thrives best in open, collaborative, experimental cultures where team members can learn and grow around a critical mass of similar talent, rather than in top-down, micromanaging bureaucracies that spread digital talent thin and stifle innovation.

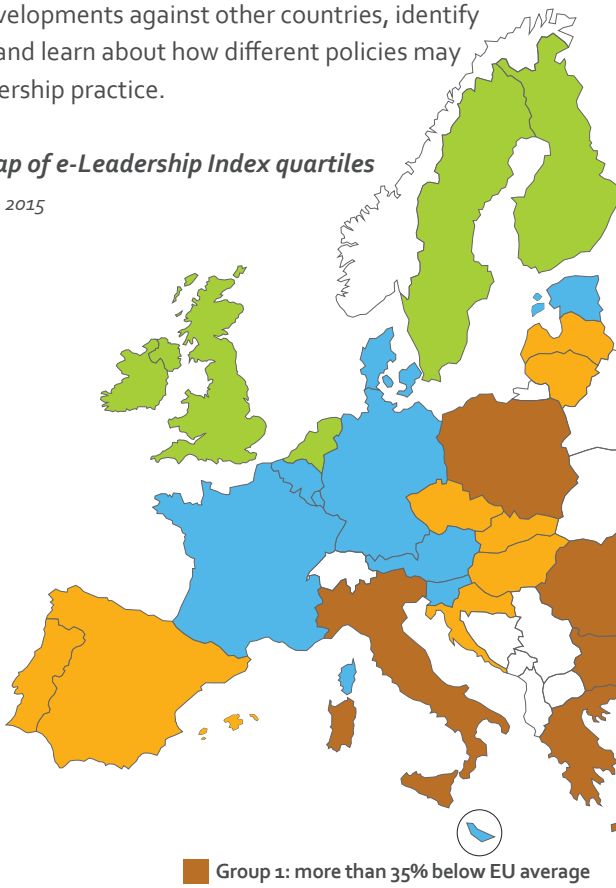
The national scoreboards are an integral part of 28 Country Reports for each EU Member State, providing a snapshot of the national situations on e-leadership policies, initiatives, practices, training, higher and executive education, and the scoreboard. Country Reports can be downloaded at http://leadership2015.eu/documents/ and http://eskills-lead.eu/documents/.

e-Leadership Index - Benchmarking Member States

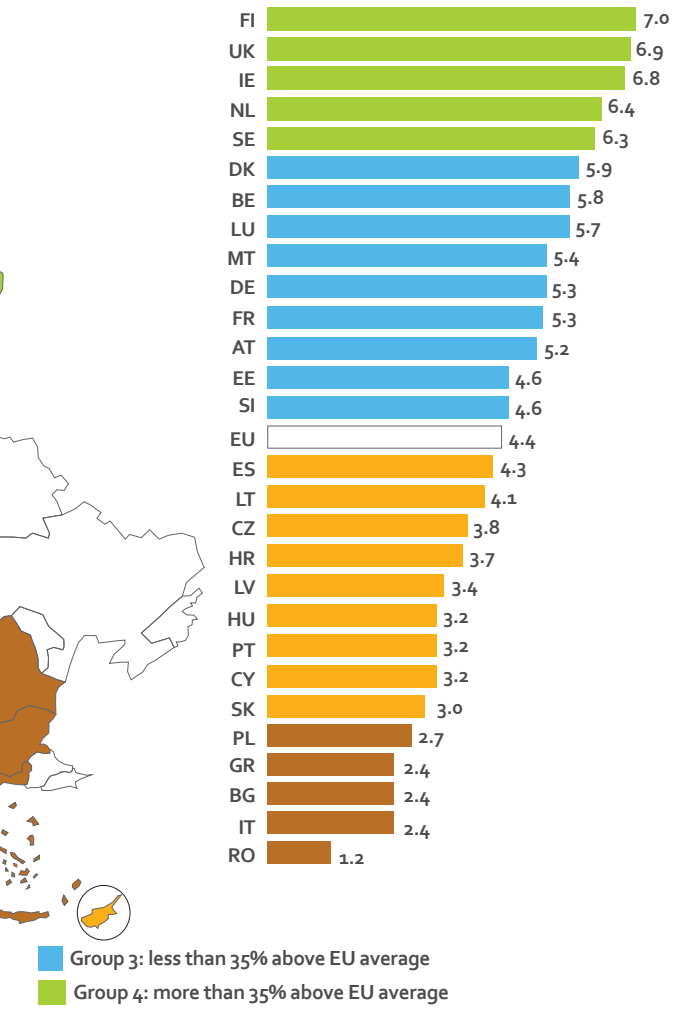
The e-Leadership Index combines the different dimensions of the e-leadership scoreboard in order to monitor and benchmark EU Member States. It amalgamates indicators on the business and policy climate, infrastructure and related outcomes on e-leadership. It is intended to help fill the need for metrics and practices that can measure and understand e-leadership. Individual countries can use the index to monitor performance over time or benchmark domestic developments against other countries, identify role models and learn about how different policies may affect e-leadership practice.

European map of e-Leadership Index quartiles

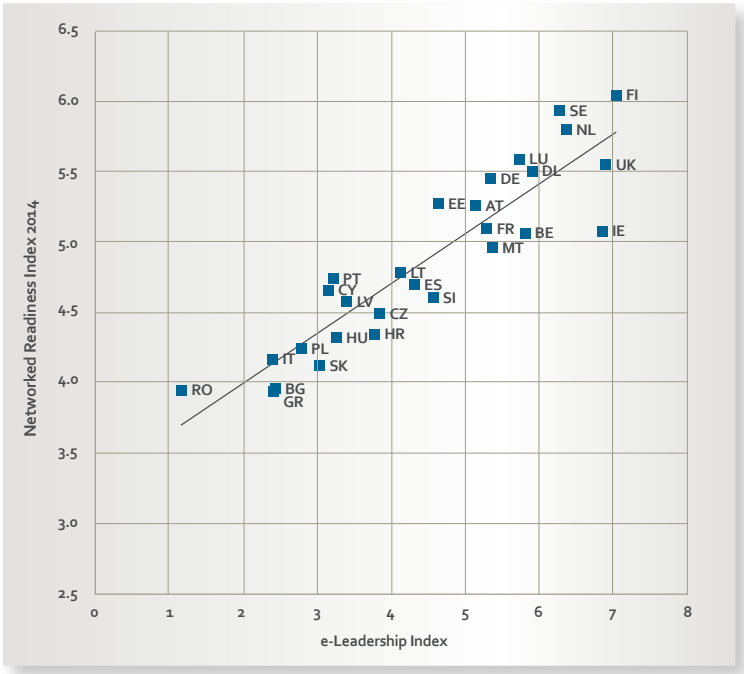
Source: empirica 2015



The e-Leadership index correlates closely with GDP data as well as with technology related indicators such as the Networked Readiness Index (of the World Economic Forum), but the deviations of technology and GDP trends lines indicate which countries perform "better" or "worse" than indicated by economic and technology maturity. Especially Ireland, but also Belgium and the UK appear to positively deviate from the "trend" of higher e-leadership maturity being associated with both higher economic power and higher digital maturity, and exhibit higher than expected e-leadership.

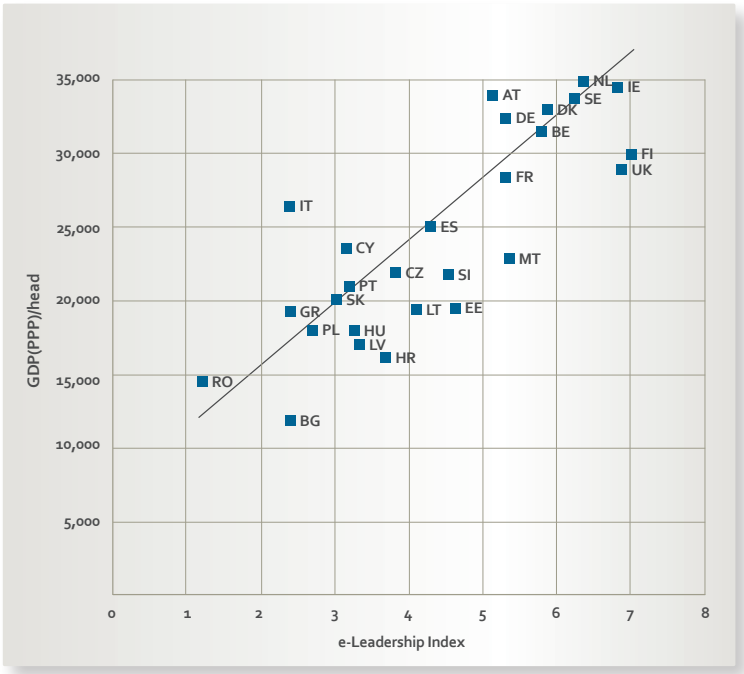


e-Leadership Index and Networked Readiness Index



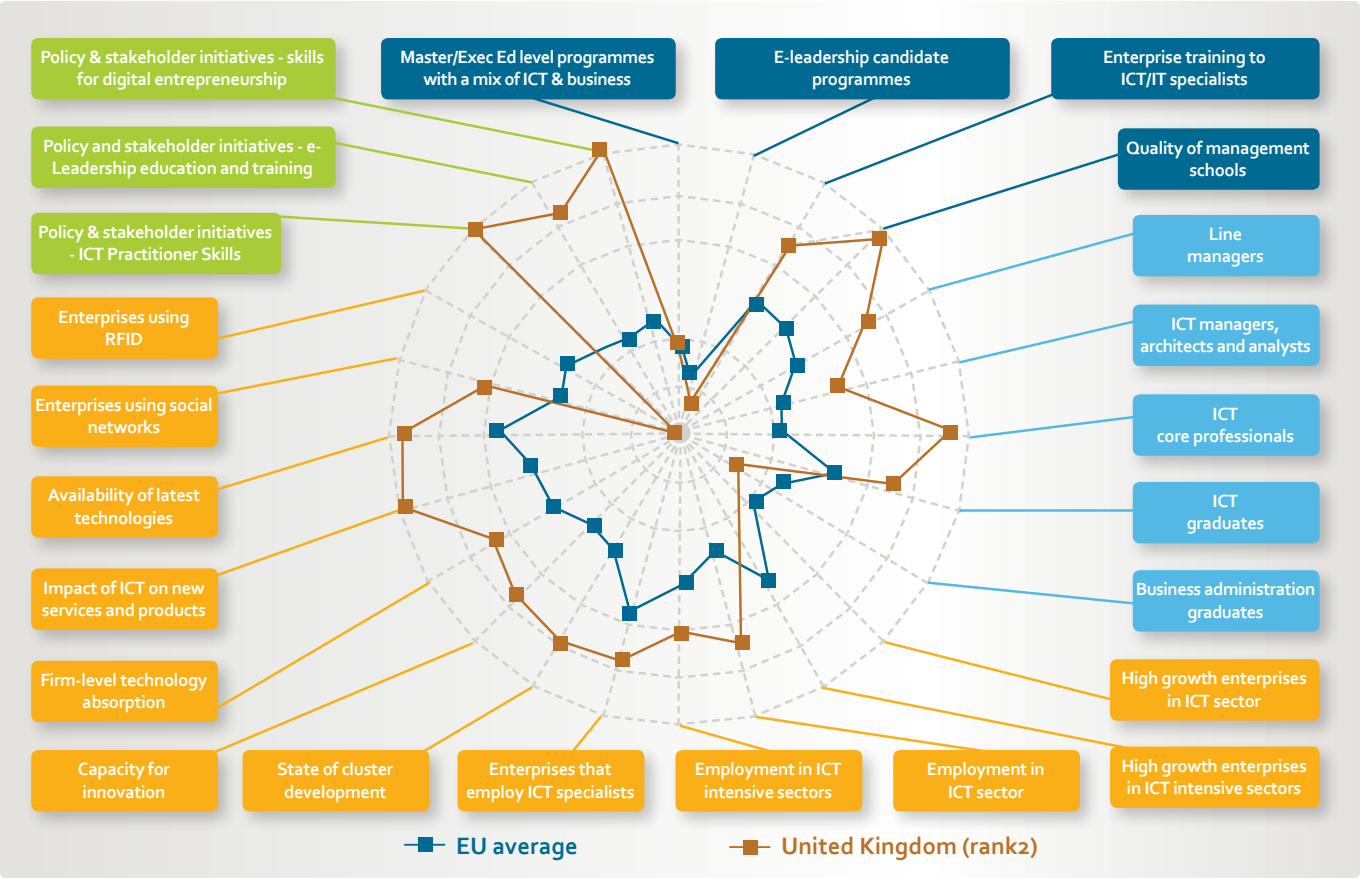
Source NRI: www.weforum.org; empirica calculations

e-Leadership Index and Networked Readiness Index



Source GDP: http://ec.europa.eu/eurostat/ Luxemburg was excluded (GDP 68,500, eLI 5.7); empirica calculations

e-Leadership Scoreboard United Kingdom



Source: empirica 2015

Growing recognition in digital skills policies

Providing SMEs and entrepreneurs with the skills for e-leadership is still often treated only as secondary to more well-established policy objectives such as take-up of digital technologies; basic digital user skills; adoption of e-government and e-business; access to venture capital; or start-up subsidies. However, the 2007 e-Skills Agenda and subsequent e-leadership skills initiatives by the European Commission have prompted some Member States to engage in public debates and helped develop appropriate responses.

e-Leadership policy is cross sectional and covers a wide spectrum of policy areas

Arnaldo Abruzzini
Secretary General, Eurochambres

e-Leadership is a pivotal factor in businesses' ability to thrive in the modern economy and to capitalize on opportunities presented by digital technologies. But it cannot be taken for granted, particularly among smaller businesses in which managers often play a multi-disciplinary role. EU, national and regional policy makers must collaborate to ensure that coherent measures are in place to facilitate the development of e-Leadership within Europe's current and future SMEs.

Today, only eight Member States have taken decisive initiatives on e-leadership education and training: Ireland, the U.K., Italy and Denmark as well as Belgium, Spain, Malta and the Netherlands. Elsewhere, the extent and consistency of policy-making is still limited and most countries lack a master strategy and continuous attention to e-leadership in policy-making.

Markku Markkula
President, EU Committee of the Regions

Europe needs to speed up change with the help of digitalisation. According to the recently approved priorities for the five-year term, we - the EU Committee of the Regions - are calling for a new entrepreneurial spirit, combined with a functioning Digital Single Market and Smart Specialisation, to lead to new skills, knowledge, innovation and employment. To become competitive, Europe needs a few committed regions and cities to take an active pioneering role in e-leadership.

The multi-stakeholder partnership (MSP) has proved useful in the e-skills domain. MSPs bring together private-sector industry and employers with the traditional education system, and complement services provided by the public sector with additional resources and knowledge.

In the e-leadership field, developing these partnerships to the same level as in digital literacy and IT practitioner skills will need key stakeholders to agree on action, help promote awareness of the topic and boost training.

Charlotte Holloway
Head of Policy and Associate Director, techUK

Government, industry, and educational institutions can together meet the digital skills challenge in the 21st century and ensure that more young people obtain digital skills and e-leadership to become entrepreneurs and makers, and to shape our digital world. techUK is delighted to work with the European Commission e-leadership programme to help tackle this challenge.

Best practices by main focus areas

Dedicated course programmes on e-leadership often arise from close cooperation between business and education. The U.K.'s Tech Industry Gold degrees are linked to the ICS Leadership Development Programme in Ireland and the Intensive Training and Masters Programmes in Knowledge Based Entrepreneurship in Malta. A partnership approach helps to align curricula with employer needs.

Education programmes for extra occupational learning are being created in response to a perceived lack of offers that suit the requirements of SMEs and entrepreneurs on duration and costs. Examples include London's Mobile Academy; THNK, the Amsterdam School of Creative Leadership; Cranfield University's IT Leadership Programme; and the British Computer Society Digital Leader coaching programme.

e-Leadership education is provided in the context of university spin-off programmes. For supporting digital-driven business cases, e-leadership training is provided, drawing upon university resources. Examples include the Henley Accelerator in the U.K. and the ECN Network in Austria.

e-Learning and MOOCs for e-leadership training are proving useful, particularly in economically less developed Member States, e.g. the Start-Up initiative in Greece and the Akademia PARP and e-Business Academy in Poland. Athens University of Economics and Business recently launched a MOOC for training in digital entrepreneurship. In France, the Conservatoire National des Arts et Métiers (CNAM) has implemented a range of MOOCs targeting those who seek to acquire leadership skills in the French-speaking world.

Subsidised or free e-leadership training to SMEs is offered by business development bodies to lower the participation barrier. This approach is increasingly used for training in e-leadership skills as well, e.g. in Northern Ireland.

e-Leadership excellence schemes are still rare; the only prominent example is Germany's Software Campus, a cooperation between government, education and industry that supports young ICT researchers of outstanding promise. While not aimed at SMEs, some participants are likely to start their own company rather than joining an established „big player".

Self-assessment tools allow SMEs to self-assess their leadership capabilities through an online platform. A good example is Northern Ireland's LMSA online diagnostic tool.

Voucher schemes have been set up in some countries to make it easy and affordable for SMEs to obtain consultancy and training, e.g. the Innovationscheckar from Sweden's VINNOVA, Enterprise Ireland's Innovation Voucher and Denmark's voucher scheme.

e-Leadership education in the context of business incubator and accelerator schemes most often takes place via consultancy and mentoring, but also through management education courses in cooperation with established providers, such as Infopole Cluster TIC in Belgium's Walloon region; WAYRA, the accelerator programme launched by Spain's Telefonica; Telenet Idealabs in Belgium; and the European Entrepreneurship Foundation in Hungary.

Business plan contests, start-up awards and the like are popular instruments for addressing the perceived shortage in leadership skills among young highly educated persons, and for motivating individuals with strong potential for digital entrepreneurship. Contests and awards are comparatively inexpensive, favoured by sponsors, and easy to promote. But they cannot offer the support needed to equip digital entrepreneurs with a sufficient e-leadership skills base.

Promotion of e-leadership skills to students takes place in Austria's AWS First initiative, the Bulgarian Young Leaders Program, Germany's Student2Start-up scheme and Finland-based Demola. The Future Leaders Development Program in Greece brings together new graduates and NGOs to solve leadership challenges. Croatia's eStudent NGO is run by and for advanced university students.

Initiatives focussing on women are targeting women who seek leadership positions in IT. Examples include the UK-based everywoman in Technology Leadership Academy, which has evolved into a global membership organisation.

Insight and awareness raising are used for promoting the e-leadership skills issue to key stakeholders and the wider public. In France, the Pasc@line Association conducted a representative business survey to investigate the issue in detail.

Specific skill requirements of SMEs and start-ups

The requirements that SMEs and entrepreneurs have for e-leadership education are diverse, but patterns emerge from the analysis. Many competence needs of fast growing SMEs and entrepreneurs can be translated into training and education offers in the three skill areas that constitute e-leadership: digital savvy, business acumen and strategic leadership skills.

Sebastiano Toffaletti
Secretary General, PIN-SME

Small and medium-sized enterprises in Europe are heavily reliant on the leadership of their owners and managers, particularly in markets where ICT can provide competitive edge. PIN-SME welcomes the Commission's follow-up of our recommendation to also address the training requirements of SMEs as part of the e-leadership initiative.

Learning requirements - Diverse and hands-on

The following picture contains the competence requirements gathered through qualitative research.

Our surveys of expectations about e-leadership education show that most SMEs need leaders with very strong, practical, hands-on, digital skills. In larger companies, the digital skills requirements for leaders often emphasize an understanding of digital capabilities (knowing what is possible, being able to budget, source and allocate work to be done), but leaders in SMEs are more closely involved in the production of digital products or services or digitally supported processes.

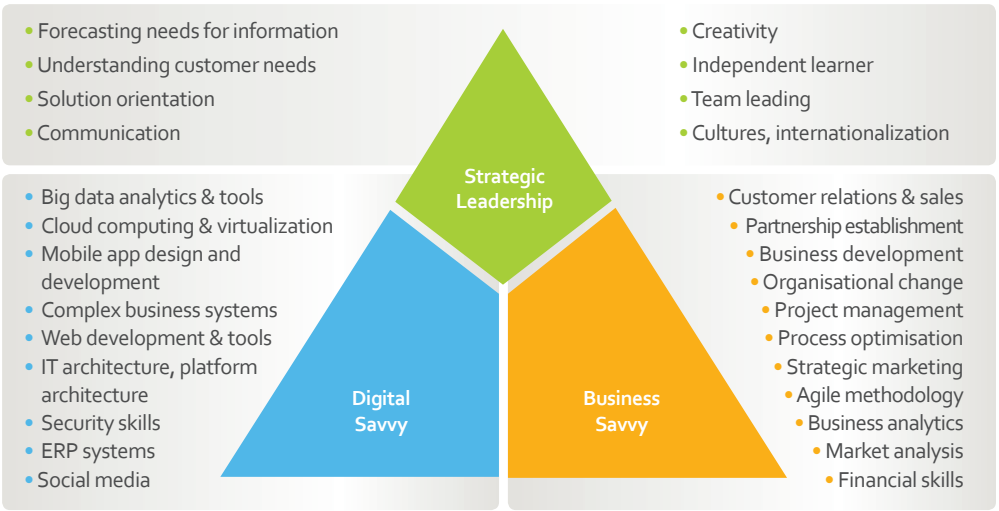
Another significant finding is that many SMEs rely heavily for their digital needs on outsourcing to consultancies, vendors or other partner enterprises in the value chain. The e-leadership requirement in SMEs therefore is to lead qualified interdisciplinary staff and consultants, contractors and vendors and other partners.

Additionally technical content education needs for SMEs include cloud computing, big data/data analytics and mobile apps development, as well as software development, web development, and programming languages and environments.

The most useful digital management trainings include enterprise architecture, governance and management.

Other e-leadership skills included communication skills, an understanding of the customers and the market, change management and project management, business development and sales and marketing.

Entrepreneurial and fast growing SMEs' competence requirements gathered through qualitative research



Source: empirica 2015

Peter Kelly
Professor of Practice, High Growth Entrepreneurship, Visiting Professor, School of Business, Trinity College Dublin, Visiting Professor, School of Design (MADA), Pontificia Universidad Catolica de Chile, Santiago

Future leaders need to discover and empower the entrepreneurs in their midst – the vitality of their business is dependent on their ability to embrace opportunity and exploit it profitably.

Need for focused, short, flexible and affordable formats

The research revealed requirements regarding the format and operational details of training and education provision: self-learning and one-to-one coaching are important because only brief absences from work are possible. Consultancy projects are often used to transfer knowledge and gain competences.

There is a preference for affordable training of a few days with flexible hours and closely targeted on acute business problems.

But founders and key employees often have a deep Higher Education background. Both targeted training as well and a broad and deep foundation is important in finding e-leadership.

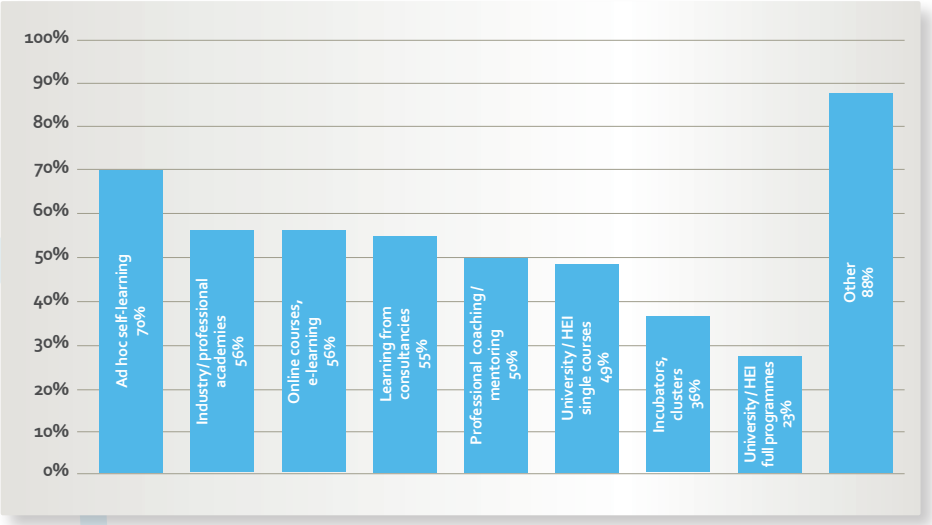
Self-learning dominates a diverse and rich learning culture

Ander Michelena
CEO and Co-Founder ticketbis.com

Online businesses have shown us the importance of iteration. However, people don't usually understand that this impacts the business as a whole. An innovative company has to iterate in every aspect of what it does: its product, its structure, its core values. We constantly ask ourselves: „What are we doing wrong? What could be improved?"

In addition to the requirements capture, a learning practice survey was carried out on 118 SMEs between March and May 2015. The population was not representative, so there is some bias towards Danish respondents, but the results are still instructive.

Of the 118 SMEs who responded, 114 reported at least one "important" source of learning among the list of 12 learning sources. On average, each SME named six sources. Ad-hoc learning comes out as the most important learning format for SMEs. Industry or professional academies and also 'learning from consultants' was also cited frequently - by 56% and 55%. Higher education institutions are seen as training providers, but mostly for single courses (49%) and less for full programmes (23%).



Percentage of SMEs that named each an "important" source of learning in their company in the areas of e-leadership skills

N=118, online survey by empirica in March - May 2015
Source: empirica 2015

Designing e-Leadership training and education

Robert Kopal
Ph.D., Vice Dean of R&D, Algebra University College

e-Leadership is not only about making best use of ICT and delivering value to your organisation. It is much more. It is the matter of preparedness: if you are prepared, e-Leadership is the evolution; if you are un-prepared, e-Leadership will be a revolution. Anyhow, in digital reality it is a necessity for all.

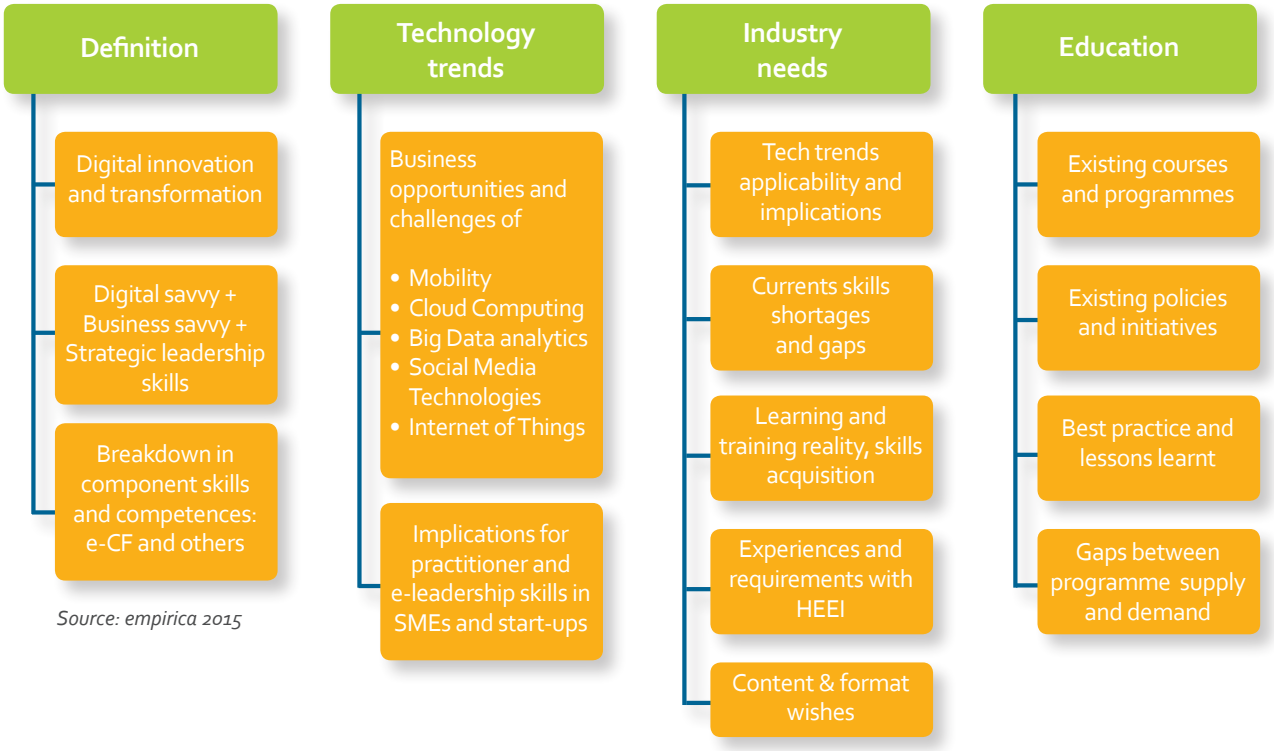
SMEs and start-up companies also show diversity in their technological, organisational and value chain set-up, and hence have differing needs for e-leadership skills, so a framework for e-leadership offers has been developed.

In line with the e-leadership skills definition, any education for e-leadership should serve the primary goal of exploiting digital technologies for innovation. e-Leadership offers may address all three competence areas, or focus on one or two of the areas when they complement existing skills and competences.

e-Leadership exploits nascent or emerging technological trends that are ready for deployment, and consequently it adapts to the evolution of digital development and its deployment in the market. Current major trends such as Mobility, Cloud Computing, Big Data analytics, Social Media Technologies, Internet of Things, Customer Experience IT and IT Security need regular revisiting so as to keep up to date.

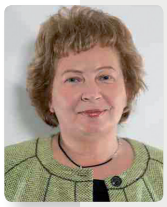
These technology trends need to be discussed with SMEs. We did so, and then we engaged with successful SMEs, including fast growing gazelles eager to expand across borders. Theoretical definitions of e-leadership and emerging technology have to be confronted with real life leadership demands, SMEs' needs for skills, and where barriers impede feeding insights into the design of educational offers.

Research based foundation of the design of educational offers



Source: empirica 2015

What is an e-Leadership training offer?



Dr. Māra Jākobsone
Coordinator of the Latvian e-Skills coalition, Vice- President of LIKTA

The e-Leadership skills initiative should take into account the specific training needs of SMEs, since they account for so much of Europe's business and jobs. Short term, non-formal training and personalized e-leadership skills development pathways could complement the formal education system.

Hugo de Sousa
Founder and CEO of ALPHAPPL

There's no e-leadership without people. Europe has plenty of unemployed "intellectual horsepower". We must continue to retrain the ones that work for a better future. Unemployment must be renamed ‚Career Shifters'.

e-Leadership can be described as a combination of leadership, business and digital savvy, distinct from the traditional separation between IT and other business functions.

Three criteria are key in distinguishing an e-leadership offer from an educational offer:

- Target group fit: an e-leadership offer targets business owners and entrepreneurs, senior professionals with advanced skills levels and decision making powers, rather than junior professionals or students. For medium sized enterprises, the target group is at executive level.
- Digital applicability: If the subject is not IT itself, its applicability to an IT based enterprise should be visibly part of the curriculum
- Skill level fit: the learning outcomes are at a level above bachelor degree level, i.e. they might be components of an MSc course.

Additionally, the offer should have at least:

- Innovation focus: business innovation/transformation potential is part of the offer; or
- Business relevance: rather than being an academic exercise, the focus is on application in a professional or organisational context; or
- Strategic relevance: the significance of technology for business is taught alongside its "technical" application.

New e-leadership training offers are emerging

An analysis of Higher Education Courses and MOOCs offered by Higher Education institutions targeted at SMEs or entrepreneurs and aiming at highly skilled professionals has shown that across the entire EU, only 56 programmes which meet all three e-leadership criteria can be found. Of these, three are Executive Masters, four MBAs, 22 Masters of Science, 19 other Masters and eight non-Masters programmes. Only eight of them last only 12 months or less, and six of these are Non-Masters and two are Other Masters. The lack of e-leadership education is striking, and so too is the limited offer of short targeted programmes meeting the needs of SMEs and start-ups.

Algebra University College e-Leadership MBA programme, Zagreb (Croatia)

Diverse pathways to e-leadership are indispensable

e-Leadership skill profiles for SME leaders cannot usually be acquired merely from an e-leadership programme at a university. It is usually the result of experiences during a career, education and training, and informal learning such as mentoring and coaching.

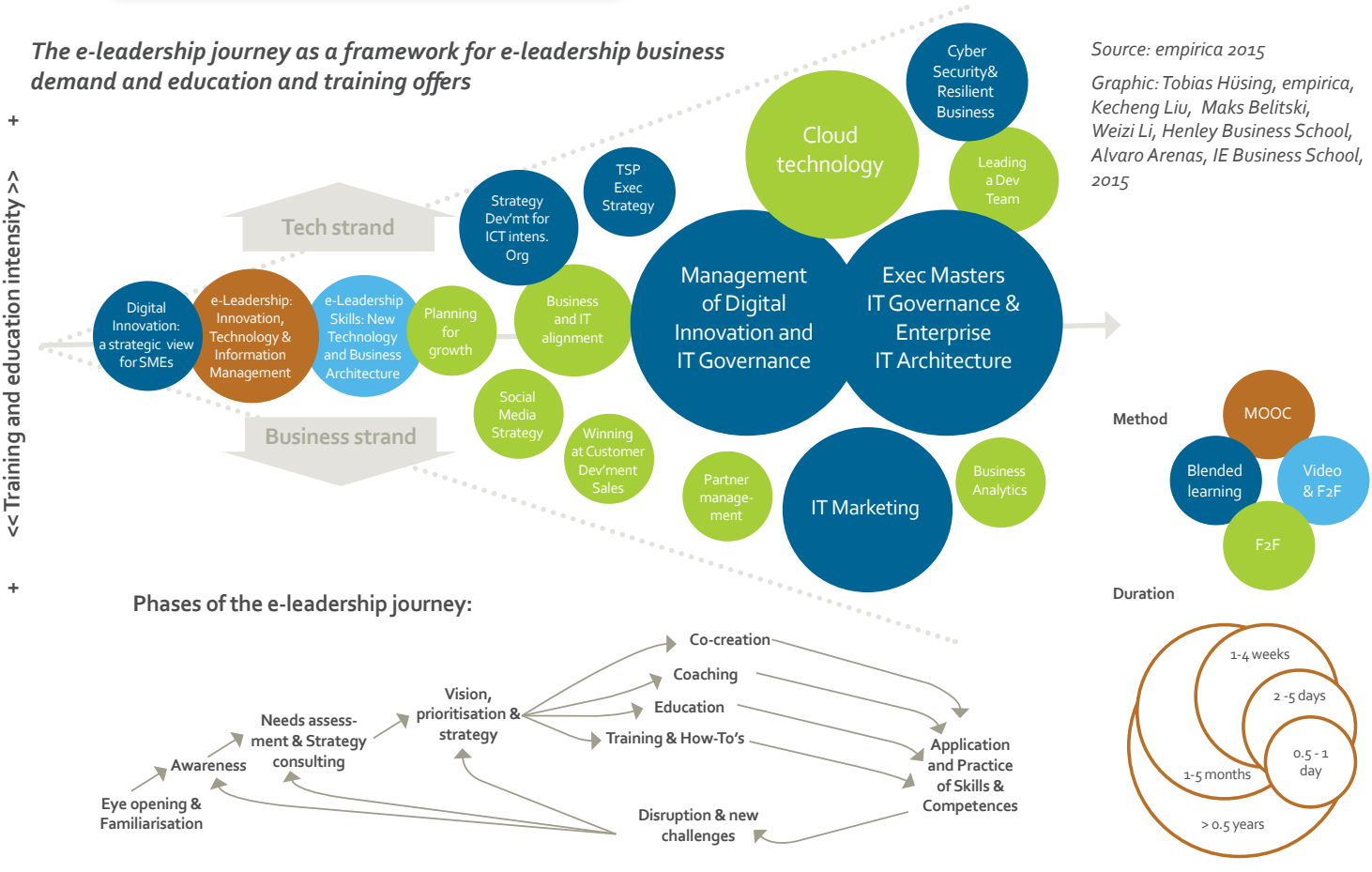
William Stevens
CEO, Tech Tour. www.techtour.com

Enterprise CEOs and entrepreneurs are being challenged more than ever to move fast to keep their organisations lean and agile. Therefore, investing and partnering to efficiently and effectively strengthen leadership skills and strategic resources is essential. The role of the board members and shareholders is to guide the leadership in meeting these challenges.

As the depth of e-leadership skills evolves, companies' needs will usually be either for further steps on the e-leadership ladder, or for diversifying and complementing existing skills at the same level.

The e-leadership journey may go from awareness and curiosity to a vision for digital transformation and its potential for innovation – that will then need translating into an implementation plan. Information events and open lectures familiarise larger numbers of individuals from target groups with the topic and stimulate their own vision. Subsequent more focused events can cater for individual needs assessment. Further stages may include training in specific e-leadership skills and competences, through traditional education programmes, specific training courses, or coaching, consulting and the co-creation of knowledge.

The e-leadership journey as a framework for e-leadership business demand and education and training offers



Source: empirica 2015

Graphic: Tobias Hüsing, empirica, Kecheng Liu, Maks Belitski, Weizi Li, Henley Business School, Alvaro Arenas, IE Business School, 2015

The courses demonstrated by partner institutions of Higher and Executive Education map this journey, serving different e-leadership needs at different stages. Needs vary from operational to strategic, and from digital to business. Prospective learners with business or IT backgrounds may choose entry points at operational or strategic level.

Pablo Hernandez
Partner, McKinsey & Company

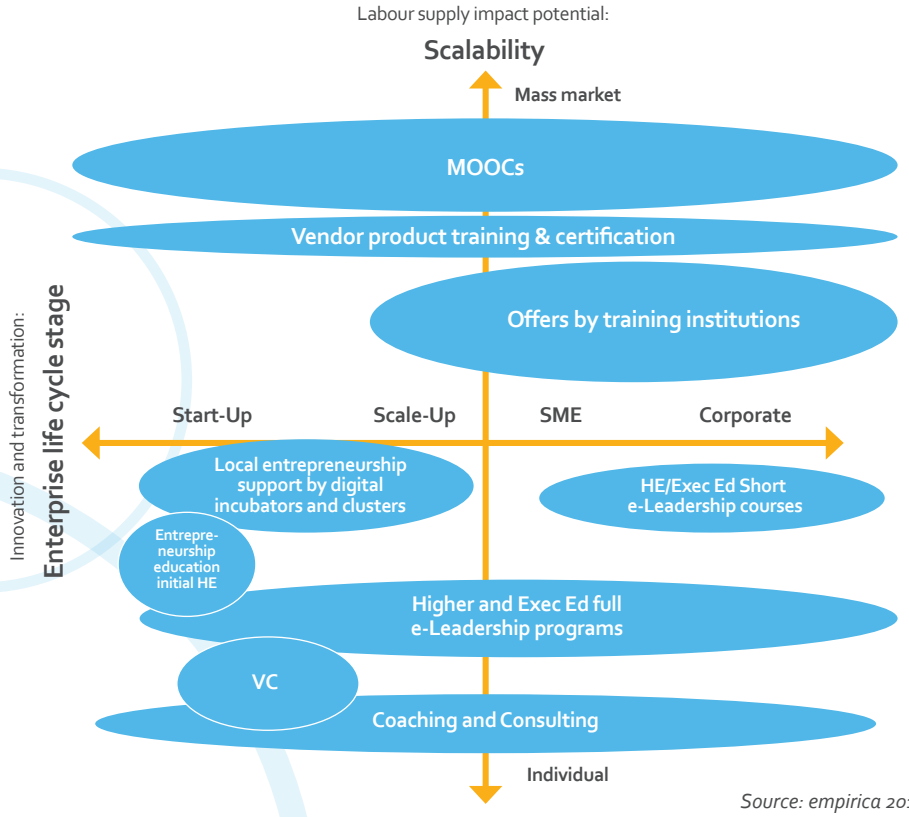
'Generation Spain' targets youth unemployment by providing skills and capabilities that employers demand.
We are looking for partners to train the next generation of young leaders in a pioneer way that combines social, job-readiness and leadership skills, with a focus on digital professions across industries

Opportunities should exist for providers of education and training to develop and offer suitable training programmes and courses for the different stages of this e-Leadership journey. In addition to universities and business schools, providers may include professional or industry academies, chambers of commerce, coaching and consulting organisations, and publishers.

Higher Education and commercial or semi-commercial training and learning material providers are well positioned to offer courses and programmes, online or offline. Consulting and coaching might be tailored to the specific needs of the enterprise.

The education and training systems of all EU Member States need to move quickly. MOOCs offer scalability and wide reach, but a survey showed only limited current coverage of e-leadership. The well-established market for

e-Leadership training by labour market impact potential and enterprise life cycle



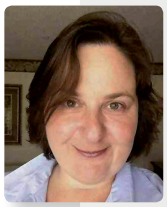
Source: empirica 2015

Graphic: Tobias Hüsing, empirica, Kecheng Liu, Maks Belitski, Weizi Li, Henley Business School, Alvaro Arenas, IE Business School, 2015

vendor and product training and certification for professional further education does not cater extensively for e-leadership. The short courses of higher and executive education institutions that explicitly address e-leadership have only limited reach, and coaching and consulting services have high costs. Self learning should be considered as an option. The greatest scope for improving e-leadership education is currently seen in MOOCs and self-directed learning, Higher and Executive Education post–graduate life-long learning offerings, and in specialist training providers.

Five pioneering universities and business schools

To address the lack of appropriate e-leadership education, five universities and business schools set out to engage with gazelle and entrepreneurial SMEs to discuss their training and education needs and to develop educational programmes accordingly.



Valentina Ivanova
Assistant Professor Information Technology and Services, New Bulgarian University

Agility in HEIs' programmes empowers students and businesses to pursue maximum business value as owners of their educational needs and goals.

Andrea Carugati
Associate Professor, Ph.D., Head IS Research Group, Study Director Master in IT, Aarhus University

e-Leadership skills go beyond decision-making in business and IT. Real E-leadership is about understanding the timing of decisions to keep organisations performing at their best.

Maks Belitski
Ph.D., Lecturer in Entrepreneurship, Henley Business School

Entrepreneurs and SMEs in the UK view the e-leadership framework as an efficient mechanism for technology recognition, application, transformation and exploitation. It allows effective alignment of IT and business strategies to innovate and win customers.

Steven de Haes
Professor, Information Systems Management, University of Antwerp, Antwerp Management School, IT Alignment and Governance Research Institute

The digital transformation of our economy generates both innovation opportunities and business risks for SMEs. e-Skilled business and IT leaders are key success factors for governing digital assets in support of IT value creation for SMEs.

Kecheng Liu
Professor in Applied Informatics, Henley Business School, University of Reading

The digital strategy and capability are prerequisite for the effective management and utilisation of information resource which in its own right is essential for the success of any business that uses ICT in their business operations.

Alvaro Arenas
Professor of Information Systems at IE Business School

Closing the e-leadership skills gap requires collaboration of demand and supply stakeholders to create new educational offers. e-Leaders must be adaptable problem-solvers with solid managerial skills and abilities to exploit digital technologies in their business. IE Business School has created a portfolio of courses to prepare students as future e-leaders.

The Agile University Approach: a series of short e-leadership courses by the New Bulgarian University

At the heart of the development work at New Bulgarian University (NBU) is the insight that

- SMEs need the knowledge and skills the university offers but
- do not recognize the Higher Education institutions as life-long learning providers.

To tackle this challenge, course development focuses on continuous curriculum improvement based on an agile methodology of incremental innovation in sprints. The traditional approach following the waterfall model of career evolution impedes quick reaction to changing skills requirements.

SMEs need flexibility –so the Agile University will respond to these needs.

Instead of NBU offering two to four years of a fixed educational programme:

- At the beginning of the educational process the SMEs will define their strategic goal and business needs.
- SMEs will consult with the University and a short term educational offer will be prepared.
- A modular list of potential offerings will be drafted.
- SMEs select educational modules that bring the highest value to their business.
- The „educational sprint" commences.
- The sprint is followed by a sprint review to check what is accomplished and a sprint retrospective to analyse the process and propose improvements.
- Then the business needs of the SME are re-evaluated against the strategic goal and
- A new modular list of educational offers will be drafted that will face the new needs and bring the highest value for the SMEs business.

Sprint duration can be from a week to a semester.
This process of sprint and review may continue as the strategic goal evolves, in a life-long learning approach of SME-university cooperation.

A mix of hands-on, technical and strategy-related courses is envisaged, responding to the needs of the target group:

- Strategy Development for Digital Intensive Organizations
- Cyber Security And Resilient Business
- IT Marketing
- Cloud Technology
- TSP (Total Software Process) Executive Strategy
- Leading a Development Team.

Modular half-day courses about SME growth, social media marketing and business analytics at Aarhus University – The e-leadership series

Aarhus University has developed the 'e-leadership series' of four courses based on the requirement capture. Courses address the need for condensed knowledge transfer in SMEs – to achieve the desired learning outcomes in half-day courses. These courses were marketed widely among the University's SME ecosystem and three courses could be piloted.

The aim is to continue to offer and adapt these courses. The demonstrations developed by Aarhus University are:

- Social Media Strategy
- Business Analytics
- Planning/Managing for Growth
- Partner management/ virtual business networks.

Adaptation of two existing long programmes to fit the needs of SMEs at Antwerp Management School

The dearth of offerings of short term, flexible courses in business critical IT is particularly acute for IT security, architecture and governance, and no offers exist specifically for smaller and younger enterprises.

At Antwerp Management School, the Executive Master programmes in IT governance and in Enterprise Architecture were not designed to cater to the needs of the SME and entrepreneurial target group.

By engaging in the SME research, Antwerp Management School was able to adapt the curriculum of the Master programmes and included a more interactive and customising approach to teaching an existing Masters programme.

Based on the research findings, it was decided to give individual coaching a larger share in the curriculum, locating the service closer to consultancy.

A new Business School Executive Education Programme for SMEs, plus two workshops at Henley Business School and a MOOC introducing e-leadership to SMEs

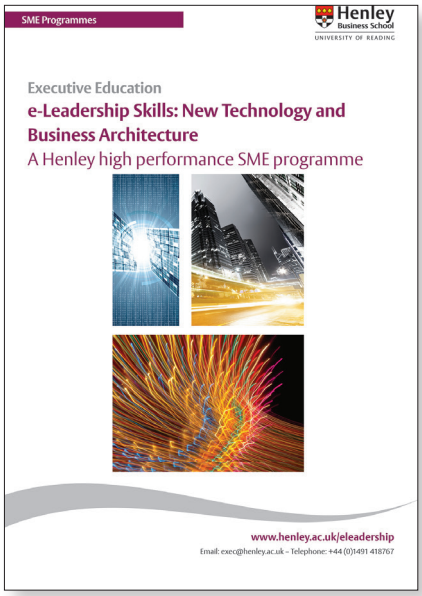
Henley Business School demonstrated e-Leadership education for fast growing and entrepreneurial SMEs in four different arenas.

The four-day programme "e-Leadership Skills: New Technology and Business Architecture" was fully developed targeting the needs of SMEs. Although not yet carried out as a real course, it will continue to be on offer at Henley and is currently marketed in a package with the other Executive education programmes "Be Exceptional".

Furthermore, Henley decided on two staged workshops with the target group to demonstrate the application of e-leadership teaching in a real life situation.

Thirdly, a business and IT alignment course was redesigned to fit an SME audience as well.

Fourthly, a MOOC is currently being produced which introduces the target group to e-Leadership.



An eye-opener MOOC and an SME executive course at Instituto de Empresa (IE Business School)

Digital technologies can help SMEs become more competitive through changes in strategy and direction, as well as improvements in efficiency and effectiveness. In this course, IE Business School reviews the IT value proposition and studies how transformation in technology provides value.

The course was taught face-to-face at IE Business Schools Campus in Madrid, and simultaneously broadcast as a MOOC. It was taught by three professors from IE Business School: Alvaro Arenas, Jose Esteves and Silvia Leal.

Based on empirical findings, the course "Management of Digital Innovation and IT Governance" was redesigned and adapted to the needs of the target group. The programme includes SPOCs (Small Private Online Courses) and classical blended teaching formats combining face-to-face and online discussion forums. The programme has been successful and will continue next year.

Policy recommendations

The following recommendations are proposed for ensuring Europe has sufficient e-leadership skills in the near future. They are to be taken forward by stakeholders in industry and academia, and by government and other stakeholders at Member State level and by the European Union institutions. They provide a roadmap for action on e-leadership skills at all levels in Europe.

Recommendation 1 – Research and training

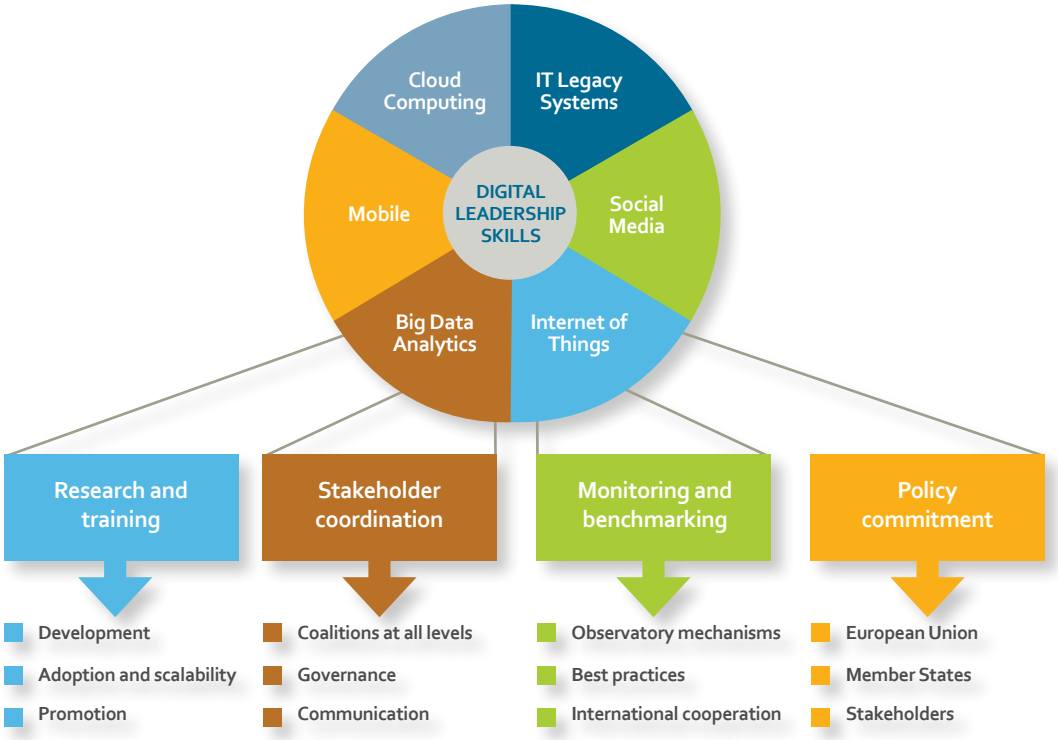
Nacho de Pinedo
Entrepreneur and Business Angel, ISDI
Institute for Internet Development

We are not living a time of change, but a change of times. The concepts of leadership, talent, skill and attitude coined in the 20th century need be revised to match the pace of this new digital era.

Research has revealed a lack of e-leadership training programmes and courses addressed to SMEs and start-ups in Europe. This applies to higher and executive education, training providers and online and blended learning providers. None of these players currently has a sufficient portfolio of solutions to address the need for providing e-leadership skills in an integrated, well recognised and accredited format. In addition, they still need to prove they are fit for such training.

Universities and business schools in Europe need to fundamental change to become academic level life-long-training providers for professionals as well as purely higher education institutions. Progress is slow and bolder actions are needed to deal with

- new online-driven education providers entering the education and training market,
- a diverse international student community with changing 'shopping' behaviour and



- increasingly demanding training offered in specific modules that can be combined in a mix-and-match fashion ('boutique students'), also asking for
- hybrid learning models for a new learning quality (e.g. gamification, virtual collaboration environments, online examination and tests, personalised learning offers etc.).

Research has shown that e-leaders, in particular in SMEs and start-ups, are moving toward the so-called pull-learning strategy, and acquire the professional knowledge they need via a variety of channels, such as MOOCs, blended education, and short courses.

Promoting and developing cooperation between higher education and industry/business is at the core of the EU's Agenda for Modernising Higher Education and a central feature of the Erasmus+ programme (2014-2020), in particular via the Strategic and Knowledge Alliances. These are designed to provide structured partnerships for collaborative projects between higher education and the business/industrial sector.

Next to the new types and ways of delivery of digital leadership education and training, there is a need for universities and business schools to increase research efforts and further conceptualise digital leadership and the organisational and human factors for its success in the enterprise context.

Prof. Mika Helenius
Aalto University, Vice Chairman of the Finnish Information Processing Association

Organisations in Europe need to regain their competitive position by improving leadership of software driven business innovation. To improve the flow of e-leadership skills, Aalto University has launched two e-Leadership programmes: a Master Degree Program in Digital Service Design and Engineering and a Future CIO executive Business and Information Systems Engineering program.

As shown below, European funding sources for strengthening research activities in this field are available, further ones may be implemented at European and national level and existing one modified to shape and establish a new European research agenda on this and related topics which are of crucial importance for European industry and the labour market.

Recommended actions

- *Training providers, higher and executive training providers and consultants to further elaborate and promote e-leadership and utilise the opportunities for e-leadership training course / programme development and provision for SMEs and start-up executives*
- *Training and education providers, Chambers of Commerce, intermediaries, sectoral associations to build strategic alliances with industry to offer suitable e-leadership programmes*
- *Stakeholders to develop new training programmes building on the experiences of the European initiatives on e-Leadership and the curriculum guidelines, profiles, labelling and course examples*
- *Training providers to adapt existing programmes and courses to meet the demand of SMEs and start-ups for e-leadership 'modules', serving specific skills demands and meeting the 'appetite' and 'shopping' behaviour of this profile of learners, including hybrid learning models such as MOOCs*
- *Universities and business schools to implement the life-long-learning paradigm and become life-long-learning training providers offering executive education and training programmes and courses of different type and size to an increasingly more diverse community at all working life-cycle stages*
- *Investigate opportunities and develop and implement faster third party certification and accreditations opportunities (including joint certification opportunities by industry and universities) attractive to target groups in a professional career*
- *Universities and business schools to put greater emphasis on digital leadership as a key research topic and develop appropriate concepts, methodologies and theory as well as learning materials*
- *European and national funding sources for strengthening research activities in thee-leadership field to be further developed to shape and establish a new European research agenda on this and related topics which are of crucial importance for European industry and the labour market*

Funding opportunities for implementation

Utilise the European Commission funding opportunities offered through:

- Erasmus+ Programme (http://ec.europa.eu/programmes/erasmus-plus/index_en.htm),
- Horizon 2020 e.g. Innovative Training Networks of Individual Fellowships (http://ec.europa.eu/research/participants/portal/desktop/en/),
- CEN Workshop on ICT Skills (http://www.cen.eu/work/areas/ict/eeducation/pages/ws-ict-skills.aspx)
- EU Structural and Social Funds (http://ec.europa.eu/regional_policy/en/funding/ and http://ec.europa.eu/esf/).
- Access to Finance portal: http://europa.eu/youreurope/business/funding-grants/access-to-finance/

Bernd Böckenhoff
CEO of Academy Cube

Providing business leaders and decision-makers with the digital skills they need is key to driving digitalisation and ensuring Europe's economic success in the 21st century. Academy Cube supports the active cultivation of these skills and helps companies as well as future leaders to take advantage of emerging opportunities in the digital world.

EUROPEAN E-LEADERSHIP CURRICULUM GUIDELINES AND PROFILES QUALITY LABEL AND SELF-EVALUATION TOOL

Access them here: http://eskills-guide.eu/documents/ and http://eskills-lead.eu/documents/

John Higgins
Director General, DIGITALEUROPE

DIGITALEUROPE will to contribute to a simple and industry focussed governance ecosystem that will promote effective e-leadership programme development, quality assessment and recognition.

Recommendation 2 – Stakeholder coordination

Given the current speed of developments, there is a need to continue mobilising stakeholders at national and European level to foster the promotion, governance and cooperation activities on e-leadership.

Awareness of e-leadership skill requirements and demand as well as related policy initiatives and actions are not equally distributed across Europe. Communication activities at all levels need to be increased. Synergy should be sought with the pan-Europe „e-Skills for Jobs" and „Watify" campaigns (2015-2016), future initiatives on skills and training and the „Grand Coalition for Digital Jobs".

Recommended actions

- *Better coordinate stakeholders to foster promotion, governance and cooperation activities on e-leadership in a coherent and efficient manner*
- *Ensure active involvement and interaction of key stakeholders*
- *Encourage action by Member State governments, stakeholders and associations, including associations of training providers and Higher Education*
- *Industry to develop and work for the long-term, in partnerships and cooperation with other stakeholders, including sector associations from the IT industry and the IT user industry*
- *Universities, business schools, employment organisations and active employers and unions to promote use of the European guidelines and profiles for new curricula for e-leadership skills*
- *Encourage stakeholders to become active partners in the establishment of an efficient governance structure*
- *Develop a governance model for digital education and training supply and move towards implementation*

Peter Hagedoorn
Secretary General, EuroCIO

EuroCIO is proud to participate in the initiative to promote e-leadership in Europe and proud that the education programme it developed with six European universities and business schools was selected to design pan-European e-leadership curriculum profiles and guidelines. Together with other European stakeholders we are now actively promoting these results to boost the supply of digital talent and create transparency in the higher and executive education market.

Recommendation 3 – Monitoring and benchmarking

Current quantitative data and statistics need further improvements to promote a better understanding of the dynamics of the demand and supply of e-leadership skills. Existing data sets do not match the concept of e-leadership.

Digital leadership skills as the combination of a set of business, digital and strategic skills cannot be easily quantified using existing data sets. Existing skills surveys such as PIAAC use a set of skills indicators too broad for e-leadership purposes. There is also no occupational matching of ISCO categories to e-leadership skilled occupations. Market surveys are costly and often too small to make comparable statements about countries. Big Data analytics merit exploration.

Regular policy monitoring and benchmarking in the e-leadership area - as has been practiced since 2007 by the European Commission and several Member States for ICT practitioners skills – would provide the information that policy makers need on strengths and weaknesses, threats and opportunities. The European Commission is willing to continue these efforts (including also digital entrepreneurship policy monitoring activities) at regular intervals to measure progress of its policy activities.

Carl Benedikt Frey
Oxford Martin School at Oxford University

European decision makers need a solid understanding of how disruption in technology, labour markets and business models challenges industry, policy action, education and training systems and other institutions and the implications on the skills and e-leadership skills required in the coming years to have good chances in the increasing worldwide competition for talent.

Best practice policy and initiative showcases allow European stakeholders to learn from experiences of other stakeholders. Competition for talent is international, so monitoring and benchmarking activities should be extended to cover Japan, US and Canada, as well as China and other countries in Asia and Latin America.

This could involve cooperation of the European Commission, Eurostat and EU Member State governments with agencies and institutions in countries outside Europe. Cooperation mechanisms should address definitions and metrics, common sets of indicators and methodological approaches, survey execution and data analysis, and should homogenise existing data sources.

Recommended actions

- *Identify new data sources for information on demand and supply of e-leadership skills, including social media data and big data analytics, to establish a comprehensive monitoring and forecasting system*
- *Ensure that definitions of e-leadership skills are adapted to new business and technological developments and remain appropriate to policy making*
- *Analyse relevant Eurostat data and exchange monitoring practice with Asia and North-America*
- *Develop innovative estimations e-leadership supply and demand figures for establishing pan-European and national observatory mechanisms to allow for a continuous monitoring and benchmarking*
- *Follow up new activities in the field of digital leadership in the world and analyse developments and their relevance for Europe*
- *Facilitate worldwide exchange of information and best practices with the advanced universities, business schools, consulting organisations in the field of digital leadership*
- *Continue identifying and promoting best practice policies and multi-stakeholder partnership initiatives*
- *Disseminate benchmarking results and best practice examples and encourage the development of online platforms*

Recommendation 4 – Policy commitment

There is broad agreement among European stakeholders and policy makers that digital leadership and entrepreneurship will be key policy topics in Europe over the coming years, especially in the context of the digital transformation of the economy. The report of the Strategic Policy Forum on „Digital Transformation of European Industry and Enterprises" includes a set of policy recommendations for the digital transformation in the EU including the development of e-leadership. The European Commission has been behind the launch of initiatives on e-leadership skills since 2013 and the Digital Entrepreneurship Monitor and the Watify campaign in 2015.

Bernhard Rohleder
CEO, Bitkom

Bitkom is convinced that there is an urgent need to bring government, industry, and educational institutions together to meet digital leadership challenges. This applies both on national and European level. Bitkom has established its own academy and cooperates closely with federal government and institutions from the higher education sector in Germany. In Europe, the Commission has launched the e-leadership initiative as a cornerstone for future excellence of the digital economy.

Yves Poilane
CEO, Telcom ParisTech and Vice-President, Pasc@line Association

The Pasc@line Association has now teamed with CIGREF and other key players in France to spread understanding of the importance of e-leadership skills. All partners agree that the approach must be dynamic: the skills to manage digital transformation are not a destination but a journey, one which help innovative companies avoid falling to Schumpeter's creative destruction.

Activities and initiatives are only slowly emerging at national level. First examples and best practice cases have been identified and are showcased on different European Commission web portals. National policy makers and stakeholder need to become more active and show a strong commitment, and implement infrastructures and initiatives in each Member State so they are anchored in national policies.

Ana Neves
Director, FCT Foundation for Science and Technology, Portuguese Ministry of Education and Science

The National Coalition for Digital Jobs in Portugal in 2015 set out to increase the supply of digitally skilled professionals, and in particular e-leadership skills are being fostered to boost growth and competitiveness.

Antonio Saravia
Deputy Director of Digital Economy at Red.es, Ministry of Industry, Energy and Tourism

The Digital Agenda in Spain has drawn all the many stakeholders together behind ambitious national targets. We now intend to start building a national coalition on e-leadership, starting with the recent national strategic agreement with Telefonica, España Open Future.

Recommended actions

- *National policy makers and stakeholders to demonstrate commitment towards e-leadership skills and digital entrepreneurship and scale up their efforts in a longer term perspective*
- *National funds and programmes to be specifically oriented towards promotion of digital transformation and the related skills required including those for digital leadership*
- *EU Member States to consider using the European Regional Development Fund and European Social Fund to invest in training and lifelong learning projects helping SMEs to make the transition to the digital economy*
- *National governments and stakeholders to implement best practice experiences in making best use of funds from successful projects*
- *Member States to build on funding programmes at EU and national levels to train and match skilled people with companies, especially SMEs*
- *The European Commission to gather information from relevant projects supported through these funds and showcase best practice cases*

Antonello Busetto
Director, Assinform - National Association of Information Technology Companies

Education is the key enabler for innovation and growth, and Assinform intends to work closely with the Ministry of Education, universities and the Agency Digital Italy to ensure that e-leadership skills for innovation are promoted in Italy.

Acknowledgements

This service contract was commissioned by the European Commission DG Internal Market, Industry, Entrepreneurship and SMEs. André Richier, Principal Administrator, Unit KETs, Digital Manufacturing and Interoperability, was our contact point throughout the study.

Top universities and business schools, key associations and specialists in entrepreneurship and SMEs contributed directly to the work under this service contract. We would like to especially acknowledge the support of Aarhus University, Antwerp Management School, Henley Business School, IE Business School, INSEAD, New Bulgarian University, PIN-SME, EYIF, CIONET, IDC, EFMD and the local hosts of the Regional Cluster Events in Germany, Spain, Finland, Portugal, the United Kingdom, France and the Czech Republic.

The results achieved would not have been possible without the generous participation of experts and national stakeholders in all EU Member States who supported the work throughout the duration of this service contract, responding to online surveys and interviews and attending the events organised.

We are grateful for the support and contributions from the members of the Steering Committee: Kumardev Chatterjee (European Young Innovators Forum), Laura Delgado Garcia (Ernst&Young), Tina Doerffer (Doerffer Leadership Group) and Bo Sejer Frandsen (it-forum).

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e-Leadership
Digital Skills for SMEs

European Commission

More information

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