NEW CURRICULA FOR E-LEADERSHIP SKILLS

GUIDELINES AND QUALITY LABELS FOR NEW CURRICULA FOR E-LEADERSHIP SKILLS IN EUROPE

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About this document

This document is the draft Final Report of the programme of work under the initiative of the European Commission on "New Curricula for e-Leadership Skills: Guidelines and Quality Lables for New Curricula for e-Leadership Skills in Europe ".

Disclaimer

The views expressed in this report are those of the authors and do not necessarily reflect those of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the information provided in this document.

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Executive Summary

The context

The programme of work under this service contract was commissioned by the European Commission (DG Internal Market, Industry, Entrepreneurship and SMEs) to develop guidelines and quality labels for new curricula fostering e-leadership skills in Europe. The work contributes to the Commission’s strategic initiative on the development for e-Leadership skills in Europe, the e-Leadership Initiative.

The approach started from market needs and existing best practice, including key industry led initiatives and the guidelines and quality labels developed are compatible with the European quality assurance reference framework for vocational education and training (EQAVET).

The focus of work is on e-leadership skills. E-leadership skills include in particular the capabilities needed to exploit opportunities provided by ICT, notably the Internet; to ensure more efficient and effective performance of different types of organisation; to identify, explore and take advantage of possibilities for new ways of conducting business/administrative and organisational processes; and/or to establish new businesses.

The scope of this element of the e-Leadership Initiative is a coverage of large enterprises, with a primary focus on leadership in the ICT function and on the skills needed for the role of CIO. The current working definition for curricula guidelines focuses on those e-leadership skills which enable people with very strong ICT skills to lead qualified staff from different disciplines towards identifying and designing business models and exploiting key innovation opportunities, making best use of developments in ICT and delivering value to their organisations.

The e-Leadership Challenge

In ensuring adequate growth and quality jobs, Europe requires strong e-leaders, capable of driving successful innovation and capitalise on advances in information and communication technologies (ICT). Economic growth to create jobs relies on innovation opportunities being identified and effectively exploited, and this in turn requires good e-leadership skills.

The European Commission has already responded to widespread inadequacies in the current market for e-skills, skills relating to ICT, as flagged by stakeholders across the EU. Based on the results of a series of studies, initiatives have been launched to help foster a full range of e-skills in Europe to promote increased professionalism among ICT practitioners. After developing strategies and instruments to bridge the gap between e-skills demand and supply, the most recent focus is on the skills gap in the e-leadership domain.

e-Leadership skills include the body of knowledge and set of competences which enables an individual to initiate and guide ICT-related innovation at all levels of enterprise, from the start-up to the largest of corporations, from private to public.

Demand is growing throughout European industry to improve the quality of e-leadership, covering organisation leadership in ICT innovation to deliver business value. Recent research has confirmed that the shortage of e-leadership skills across Europe is significant, calling for action.
Closing the e-leadership skills gap requires a range of actions to improve the functioning of Europe's educational ecosystem:

- Improve processes of generating educational offers with demand and supply stakeholders,
- Encourage programmes based on new course design and content,
- Strengthen communication flows in e-leadership skills development and deployment.

The continuing emergence of new applications of ICT both brings enormous opportunities for European enterprise and represents a challenge for Europe in terms of providing the understanding and skills to grasp these opportunities for competitiveness and growth.

Currently, the world of information and communication technology (ICT) is in the midst of a completely new wave of innovation, characterised by the confluence of social, mobile and cloud technologies, the rise of Big Data and the new kinds of analytics needed to create value in this environment. This sea-change comprises multiple trends, some of which can are expected to strongly affect demand for e-leadership skills over the next decade.

The trends we identified have strongly disruptive potential - rapidly advancing technologies with broad scope of impact and significant value which will dramatically change market balance. These will profoundly change the skills balance, reducing operational ICT skills and enhancing specialized design and deployment skills for new digital services. e-Leadership skills are needed to identify and exploit these new opportunities for business growth.

Source: 2011-2013 data based on Eurostat LFS, forecast by empirica and IDC^{1}

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^{1} See footnote 5
Technology trends requiring skill response

**Mobility:** The extremely rapid penetration of mobile devices and technologies in the market and the broad phenomenon of leveraging mobile solutions in the business environment.

**Cloud computing:** the disruptive delivery model of IT software and services, virtual platforms, infrastructure and business processes, based on flexible and on-demand business models.

**Big data analytics:** a new generation of technologies and architectures, designed to economically extract value from very large volumes of a wide variety of data, by enabling high velocity capture, discovery, and/or analysis.

**Social Media technologies:** the use of social media within and outside the enterprise, implementing social marketing techniques and facilitating collaboration and knowledge sharing.

**Internet of Things:** A dynamic global network infrastructure with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual “things” have identities, physical attributes, and virtual personalities, use intelligent interfaces, and are seamlessly integrated into the information network.

**Secure systems:** given the increasing dependency of European organizations on ICT systems, and the growing complexity of connected environments, there is strong demand for and diffusion of software and tools to insure IT systems security at all levels.

**Microelectronics** and parallel systems: the diffusion of multicore/manycore technologies, in-memory computing, cognitive chips is profoundly changing the semiconductor industry and affecting the dynamics of all microprocessor end user markets. Parallelism in particular creates a number of challenges for software development and requires a change of tools, systems and methods of software design and development.

**Convergence:** Over and above the impact of each trend, the convergence of these new technologies is having cumulative effect on market structure; their joint exploitation places yet greater demands on e-leadership competence.

Forecasting e-leadership

A survey of enterprises has been carried out in 2013 with the ambition to identify and quantify enterprises which successfully carried out innovative IT projects and within those enterprises the actual number of employees in and outside of IT departments who were initiating and leading these projects. The results have been used to estimate a European quantification of e-leadership workforce, which we estimate to lie in the range of 568,000 (number of persons successfully proposing innovative projects using IT) to 802,000 (leading projects for innovative projects using IT) for the EU-28. In total, about 40% of e-leaders are found within IT departments and 60% outside. E-Leaders in SMEs account for 70-75% of all e-leaders.

With demand established to be in the range of 568,000 to 802,000 for 2013, forecasting for e-leadership demand must rely on estimated growth rates as little market data for e-leadership vacancies or future hiring is available. We use an analogy to the most highly skilled ICT positions, for which such estimations exist. IDC and empirica have forecast demand for highly skilled ICT occupations\(^2\) to rise by on average 4.6% until 2020\(^3\). It seems reasonable to assume that demand for e-leadership is closely coupled with highest skilled ICT jobs.

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\(^2\) ICT management, architecture and analysis skills. Demand for these jobs is forecast to rise from 1.94 million (2013) to 2.65 million (2020).
Demand in 2015 is estimated to be in range of 620,000 to 875,000 by applying a 4.6% growth rate and estimated to grow to a range of 776,000 to 1,096,000 in 2020.

Taking account of expansion (new jobs) demand and replacement (because of retirements etc.) demand, Europe will so need between 200,000 and 350,000 additional e-leaders by 2020, or between 40,000 and 70,000 per year.

**Figure 2 – e-Leadership job demand forecast for the EU28 2013 – 2020**

This presents a strong challenge to the current educational ecosystem. Only 21 programmes were found in Europe that deliver e-leadership programmes as stakeholders had defined them – delivering the capability to lead business transformation to experienced executives.

National correspondents in all Member States in early 2013 carried out a systematic search for e-leadership educational programmes already being offered. The results show that Europe has been through a boom in cross-disciplinary programmes at Masters Level – combining business and IT, but mainly for career entrants.

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Demand is growing throughout Europe to accelerate innovation, strengthening competitiveness, driving growth in the economy and creating jobs. A major factor in innovation performance is the strength of leadership, particularly to take advantage of new opportunities in information and communication technology (ICT). The skills of this e-leadership are now in great demand, but the supply as yet weak, for a number of reasons. A coordinated response is called for.

**Responding to Demand**

The e-Leadership Initiative was launched by the European Commission, focussing first on e-leadership skills for large enterprises. The objective is to develop, demonstrate and disseminate European guidelines and quality labels for new curricula fostering e-leadership skills.

The guidelines for curricula and quality labels were developed using results from surveys, stakeholder input and analysis of best practice in cooperation with world class business schools. The guidelines have been used across Europe gaining strong acceptance and proved usefulness to stakeholders.

Major improvements will flow from scaling up best practice in market requirements communication, content transparency and quality label award.

The focus is on e-leadership skills for people in “resource-rich” positions in enterprises, where executives are able to mobilise significant human and other resources. Such executives including CIOs and related C-level posts guide the top echelons of the human resources of an enterprise and take direct responsibility for business, innovation and competitiveness.

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4 This picture has already begun to change, with several more programmes known to have been introduced.
Quality can be kept up easily if demand-side understanding of skills requirements at the workplace are fed back to providers. Feedback from alumni will help maintain attractiveness of delivery and content and provide added information on developing leadership requirements in work.

The first phase of the e-Leadership Initiative focuses on the leadership needs of top decision-makers in larger enterprises. The executives oversee portfolios comprising both well-defined and emergent innovation opportunities. Their pursuit of innovation requires engaging highly qualified staff, many of whom need developing to reach the necessary excellent understanding of ICT and its potential value.

Specific skills include the rapid, disciplined assessment of business cases and risks while encouraging the creativity needed to design new business models and exploit innovation opportunities.

As part of the Commission e-Leadership Initiative, guidelines have been developed for curricula to deliver into roles of e-leadership in enterprises. The intention is to make a major contribution to closing the e-leadership skills gap.

The approach supports the characterisation of skills which enable e-leadership into enterprise decision-making, and the definition of learning outcomes appropriate to action in key roles, up to C-level. Curriculum profiles are generated which define the target content and education experiences to be included in e-leadership curricula offered by institutions of higher and executive education.

Implementation of the guidelines provides transparency to enterprises seeking e-leadership and to professionals wishing to engage in further education with the prospect of more responsibility for and success in business transformation.

Demonstrations took place with different business schools and universities in Europe. It has been demonstrated in practice how curriculum profiles combined with quality criteria can be used by market participants to evaluate programmes provided by higher educational institutions and business schools.

The development and improvement of attractive, adapted, up-to-date educational offers has been encouraged, able to increase the supply of experienced and highly qualified leaders in ICT-based innovation in the private and public sector.

To scale up the delivery of e-leadership skills while keeping programmes affordable, innovation in the teaching of e-leadership skills is in demand, and online course provision is clearly an attractive alternative.

However, though there has been some investment in “massive open online courses” (MOOC) in fields related to e-leadership in Europe and the USA, the results are not yet fully visible.

Most universities have a programme at Master’s level on ICT and management but even in the USA these are taught traditionally, on site. MOOCs today deal primarily with topics at a low level by university standards, typically with learning objectives which have remained stable for some years - not a characteristic of ICT fields.

Online programmes of any kind which combine ICT and business skills are as yet few and far between. The offer is of isolated, very short - quick-fix “pills” lasting under an hour. These are neither integrated into a larger programme nor provide credits in recognition of a contribution to such.
Foundations

The guidelines for e-leadership curricula have been built on existing European and world best practice. A key input has been the excellent EuroCIO programme for executive education. A hierarchy of modular programmes deliver leadership and professional qualifications.

Figure 4 – Best practice in e-leadership education from EuroCIO

In the education approach, curricular development is based on intensive negotiation in a committee comprising industry and a small number of business schools. Each committee deals with a single specific programme offer. To supply the numbers Europe requires, new techniques have been deployed to scale up all features of this programme.

The e-Leadership Initiative builds on the conclusions of the INSEAD study "European e-Competence Curricula Development Guidelines" comprising policy and institutional guidelines across the full e-skills domain. The policy guidelines are to:

- reward life-long learning, enhancing skills among those already employed and with experience, especially for enterprise architecture, strategy and innovation;
- ensure programmes on offer are based on stable but flexible curricula which are vendor neutral.
- encourage academia, business and public sectors to engage regularly and focus on complementarities rather than differences;
- allow academia to ensure the relevance and durability of the curriculum approach;
- encourage industry to strengthen personal development and provide incentives to life-long learning e.g. by including in performance rating;

The institutional guidelines for successful curriculum development recommend:

1. creating appetite for potential students;
2. creating relevance for industry and potential employers generally;
3. designing curricula as a set of modules, making them easy to combine with other curricula, fostering multi-disciplinary approaches;
(4) anticipating graduates’ need to keep knowledge up-to-date;

(5) monitoring the curricula design and delivery process to constantly improve;

The approach to scaling-up e-leadership skill provision takes full account of these guidelines. The e-Leadership Initiatives elevates the INSEAD ideas to the level of a portfolio of new curricula delivering e-leadership skills, which are embedded in a sustainable, living quality assurance framework. This framework ensures an optimal, ongoing match between course content and innovation and leadership requirements across economic sectors and organisation sizes.

The multi-skill concept of e-Leadership and its relevance for future economic and social development in the European economy has been confirmed by the vast majority of stakeholders in the field.

The curriculum profiles respond to stakeholders’ insistence that curriculum guidelines should leverage the improved market transparency of links to the e-Competence Framework. Each curriculum profile maps to the European e-Competence Framework and makes clear, which e-CF competences are improved by compliant programmes.

**Guidelines for new curricula**

Scaling up the supply of e-leadership skills requires mechanisms to address a lack of transparency in the content of programmes offered. Different programmes are not easily compared, so that trust in offers is limited. Recognition from a trusted source is a well-tried mechanism to engender trust and unleash action and accelerate the flow of e-leadership skills.

*Figure 5 – Summary of the roles of transparency, comparability and trust in supporting programme recognition*

Scaling up the approach requires a clear analysis of locations and processes where improvements in transparency and comparability can be provided, clear specification of how alignment to requirements of innovation leadership in the large enterprise workplace can be guaranteed and how clear signals can be given that certain educational offers deliver against
these requirements. The e-leadership skills development ecosystem provides an appropriate analytic framework.

**Figure 6 – The e-leadership skills development ecosystem**

The guidelines and quality labels centre on a portfolio of e-leadership curriculum profiles, flanked by quality assessment and stakeholder interaction, incorporating effective feedback channels. Curriculum profiles bring transparency and comparability of educational offers to stakeholders in the e-leadership skills development ecosystem. Institutions of higher education and business schools are provided with the means to align programme learning outcomes to corporate demand for skilled executives in a way transparent to employers and future e-leaders.

The e-leadership curriculum profiles, which are key to the guidelines on new curriculum development, are developed by a team of academics and industry representatives supported by education experts. Curriculum profiles are to provide comparability across e-leadership programmes – bringing transparency into the e-skills ecosystem. To do this they describe, transport and expose demand for e-leadership skill sets and provide a vehicle for the curricula of e-leadership programmes to keep in tune with a changing environment.

Curriculum profiles are simple in structure and potentially place very few demands on resources for maintenance and use. This is in tune with the current economic climate - there is no revenue for paying for buildings full of specialists to develop, maintain and operate new systems. Solutions today must be lightweight!
Figure 7 – Components of an e-leadership curriculum profile

- **Title**: Meaningful name of the curriculum Profile
- **Rationale**: Short description of relevance and demand
- **Sample Roles**: Indication of typical roles in working environments
- **Core Content**: The main topics related to this type of profile
- **Learning Outcomes**: Knowledge, skills and competences
- **Competences**: Mapped to e-Competence Framework
Figure 8 – Example of an e-leadership curriculum profile: Business Enterprise Architecture

Every curriculum profile has a name and a raison d’etre – a concise statement as to why it is a necessary addition to the portfolio. The flavour of e-leadership, the roles the curricula qualify for, are listed along with essential content.

The core of each curriculum profile comprises the learning outcomes to be achieved on successful completion. Learning outcomes are the knowledge, skills and competences which a programme delivers to participants to shape their e-leadership skills.

All the curriculum profiles developed in the first phase of the e-Leadership Initiative deliver the core competence set for e-leadership in large corporations.
Learning outcomes are fully referenced to the e-Competence Framework for maximum transparency and to leverage existing self-assessment and human resources planning.

Aligning programmes to Curriculum Profiles will really accelerate skills flow, meeting requirements stakeholders on supply and demand side of the e-leadership eco-system have set, that these:

- Inspire higher and executive education to develop new programmes
- Leverage academic expertise – don’t tell them how to teach,
- ... leave them to incorporate the latest research
- Expose the results wanted, the learning outcomes in demand

Adoption of the Guidelines and supply of conformant programmes will

- Have real impact on executive training and hiring decisions
- Provide transparency to aspiring e-leaders: guide them in their choice of further education

The approach takes full account of the fact that there are different sets of e-leadership skills for different roles.

Industry and higher education have provided version 1 of three profiles:

- Business and Enterprise Architecture
- Information Security Governance and
- Innovation and Transformation through ICT

Curriculum profiles adapt as requirements shift, new profiles are generated where the portfolio scope proves too narrow, and programmes deliver ensured quality. Programme providers can easily analyse their existing offers and use a profile to adapt, or design from scratch, using a simple self-evaluation tool. The prototype of a tool is available to support the structured comparison of a single education programme against a curriculum profile, building upon quality criteria and producing an assessment report on an education offer.

An HEI can carry out its own evaluation of its programme with results published on the web, in full view of aspiring executives, top management looking to recruit or train e-leaders.

For added confidence, a quality label has been defined based on lightweight independent assessment, reusing existing certification.

The Quality Label for e-Leadership education comprises criteria, processes and a label management system, embedded in an appropriate governance structure and with light management in place. For providing independent quality assessment, existing accreditation is to be fully taken into account and past assessments and investigations, e.g. in national systems of accreditation, reused to the greatest extent possible.

**A prototype for online transparency in education**

A prototype web environment has been developed to demonstrate the guidelines with its new approach to curriculum transparency and comparability. It has been shown that such an environment can easily support recognition, stakeholder interaction and feedback, with a minimum of administration overhead.

The diagram shows how three curriculum profiles could be presented for those interested to delve into the detailed specification to understand the content in full.
Figure 9 – Prototype presentation of a portfolio of e-leadership curriculum profiles

The prototype web environment supports interactive presentation of each curriculum profile in the portfolio. Each curriculum profile centres on a set of carefully worded learning outcomes. Each has a rationale, core content, makes specification of the appropriate learning experience, shows the link between learning outcomes and the corresponding e-CF competency, and specified under "e-Leadership understanding" the subject-matter the e-leaders must understand well enough to lead others in performance, not to perform themselves.
Publishing the complete curriculum profile is a strong contribution to increased transparency, and is intended to be combined an offer to provide input to improve a profile and ensure it is fully up to date at all times.

A principle in reducing administrative overhead is that logo and all material is provided directly by the educational institutions themselves.

Programme owners also carry out the evaluations themselves, using simple tools to map their programme to a Curriculum Profile.

Employers and alumni can register to engage in collaborative improvement. Programme evaluations – and curriculum profiles - are exposed to feedback from stakeholders and knowledge holders.

The target is moving. With this direct feedback, necessary changes can be quickly triggered, this is maximum agility.

To introduce full transparency for individual educational offers, it is envisaged that institutions of higher education and business schools can register and submit an evaluation of their programmes against a curriculum profile. Each element of the mapping of individual programmes to a profile can be captured as fully or partially compliant, delivering excellent transparency and building a strong framework for comparability of educational offers.
A key to providing a quality label is that the claim or standard to be measured against is clear. The claim for programmes which are compliant with a recognised e-leadership curriculum profile is strong and easy to understand.
Once a programme has been evaluated and the evaluation accepted, it can be presented in full transparency making its compliance with the curriculum profile transparent to all interested parties.
Triggering response

Development of the curricula guidelines in 2013 was followed in 2014 with a series of demonstrations. Demonstration activities were open to education institutions, industry partners and associations promoting e-leadership skill requirements in the workplace.

Dissemination of the European Guidelines and Quality Label was engaged in from the beginning of 2014. Activities centred on a series of regional cluster events across Europe.
The new ideas were taken out across Europe in a series of events. These engaged over 1200 experts, policy-makers and stakeholders from industry and academia from nearly all EU countries.

The multi-region campaign was followed by a high-level conference in Brussels, which attracted some 300 participants from across the EU.

In pan-European dissemination, a local host championed each event, and engaged each region’s top education providers and the key industry players. The events across Europe have generated great interest and mobilised growing strength of activity among all stakeholder groups.

The regional cluster events took place in Sofia (Bulgaria), Henley (United Kingdom), Munich (Germany), Milan (Italy), Madrid (Spain), Antwerp (Belgium), Budapest (Hungary), Aarhus (Denmark), Paris (France), and Wroclaw (Poland). Feedback from participants was very positive, with ratings of contributions averaging 4.4 on a 5 point scale - 88% of "very positive" ratings.

Experts gave a number of interesting insights into the importance of e-leadership in their region or environment. In Budapest a local expert recognised an existential threat to business if the supply of e-leaders remains so low: “If organisations cannot transform their business models, they may not survive. e-Leaders are needed to make this transformation but they are hard to find.” (Regional Cluster Event Budapest, Zoltan Buzady). In Milan one
expert emphasised the need for ongoing dialogue between industry, universities and business schools, but Danish academics and industry representatives emphasised the need for a range of different types of e-leaders – horses for courses: "Different types of e-leaders are needed to best develop ICT-based services [...] The variety of application areas does not allow for a one-size-fits-all approach” (Regional Cluster Event Aarhus, Birgitte Hjelm Pavlsen). An enterprise architect from the top of European insurance had a nice metaphor: e-leaders have to be comfortable travelling up and down between basement IT and high-flying strategy in the board-room: “My vision of the e-leader is someone comfortable with regularly taking the elevator from board room to engine room and feeling at ease in both environments” said the industry expert at the Regional Cluster Event in Munich. Other comments were that “ICT is a key strategy item to leap frog the CEE to a higher value region. These countries can turn challenges to advantages by utilising the good local talents via a professional management and (e-) leadership strategy.” (Regional Cluster Event Budapest, Prof. Mel Horwitch); “The establishment of a continuous dialogue between industry demanding e-leadership type individuals and universities and business schools expected to supply these to the market is needed” (Regional Cluster Event Milan, Lex Hendriks) and “The Curriculum Profile approach and self assessment allows universities and business schools to develop fully fledged e-leadership courses demanded by industry and in the market” (Regional Cluster Event Madrid: Prof. Eduardo Vendrell).

Local hosts engaged excellent chairpersons and the events were professionally organised at some top locations.

**The initiative moving forward**

As the guidelines are taken up and curriculum profiles develop, a complete system of curricula generation and delivery will

- Deliver market transparency: certificates issued on successful completion of a programme contain a clear set of learning outcomes easily understood by any employer looking for candidates with e-leadership skills;
- Encourage autonomous innovation in teaching: any European educational institution can develop their own approach to meeting e-leadership curricula profiles in an employer-verified portfolio, modified and extended based on advice from education providers;
- Adapt to changes in life-long learning trajectories (LLL), by providing mechanisms by which students having studied related courses for a recognised Masters degree or MBA can receive full credit for conformant learning outcomes.

Innovations like the European guidelines with the e-leadership curriculum profiles do not occur without disruption. In demonstration one business school reprinted all its brochures to implement necessary changes. New programmes built to meet e-leadership criteria replace earlier formats and content.

Triggered by the Commission, this new approach to fostering e-leadership skills is now thoroughly underway. The major European CIO associations EuroCIO (also taking ownership of the e-leadership curriculum profiles) and CIONET together with DIGITALEUROPE the European association representing Europe’s ICT industry and PIN-SME representing the interests of SMEs in the ICT sector are acting as the governance board of this initiative together with EXIN, APMG International, ASIIN and EQANIE as the service providers supporting e-leadership curriculum profile maintenance, the creation of further ones and
providing quality assurance on programmes submitted. They are supported by a group of academic partners as depicted in the graphic below.

**Figure 15 – European e-leadership initiative governance and service provision**

- **Governance**
  - Running the initiative

- **Service Provision**
  - Maintaining CPs
  - Creating New CPs
  - Providing QA on programmes submitted

- **Curriculum Profile Ownership**

- **EuroCIO, CIONET DIGITALEUROPE, PIN-SME ...**

- **EXIN, ASIIN, APMG, EQANIE ...**

- **Academic partners**
  - BEA: Henley Business School
  - ITTI: Technical University Munich
  - ISG: Antwerp University, TIAS Tilburg
1 Addressing the demand for e-leadership skills

1.1 Objectives and approach

The European Commission DG Internal Market, Industry, Entrepreneurship and SMEs in 2013 launched a strategic initiative on the development for e-Leadership skills in Europe. As part of this initiative, a services contract on ‘European Guidelines and Quality Labels for New Curricula for e-Leadership Skills’ was commissioned, to develop, demonstrate and disseminate European guidelines and quality labels for new curricula fostering e-leadership skills. Active cooperation with key stakeholders has taken place to ensure that the European guidelines and quality labels are effective and sustainable in the marketplace and that they result in an offer of a broad portfolio of quality-assured new curricula fostering an appropriately full range of e-leadership skills.

The results are presented here. The new curricula are firmly based on market needs and capitalise on current best practice, including work by multi-stakeholder partnerships, universities, business schools and industry led initiatives.

An extended, multi-region pilot demonstration of the implementation of the European guidelines and quality labels has been organised, flanked by a pan-European dissemination campaign, including ten high-profile events easily accessible to all regions of the EU.

The activities under the service contract have included:

- The development of European guidelines and quality labels for new curricula fostering e-leadership skills;
- A pilot demonstration of the implementation of the proposed European guidelines and quality labels proposals by several different universities and business schools from different European countries;
- A pan-European dissemination campaign.

The target groups for the guidelines are:

- ICT professionals and managers, entrepreneurs and freelancers (professionals who need e-leadership skills) and enterprises, SMEs and start-ups in all sectors with a particular focus on Chief Information Officers – CIOs - in larger enterprise;
- Business managers and professionals who have hybrid skills and increasingly take a key part in e-leadership initiatives via roles such as business architects and digital business managers.
- Enterprises in all sectors with a particular focus on "gazelles" seeking to develop cross-border business and/or competitive advantages with ICT;

New technological trends are thoroughly integrated in the whole approach.


The work was organised in 7 work packages running over 24 months, in three phases, with the first phase (month 1-6) covering detailed planning, stakeholder interviews and surveys as well as the collection and analysis of recent and up-to-date information and data regarding supply and demand in respect of curricula for e-leadership skills in Europe. The second phase (month 6-12) included analysis and documentation of a range of cases of best practice and
the development of European guidelines and quality labels - fully compatible with EQAVET - for new curricula for eLeadership. The third and final phase (month 12-24) comprised the multi-region demonstration pilot implementation of the European guidelines and of the quality labels, along with the organisation and execution of a comprehensive pan-EU dissemination campaign, with events organised in 10 EU Member States.

**Figure 16 – ICT workforce development 2011 – 2013 and expected development until 2015 by job categories in Europe**

![Chart showing ICT workforce development](chart)

*Source: Based on Eurostat LFS data*

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5 Management, architecture and analysis skills includes ISCO categories
- Information and communications technology service managers
- Management and organization analysts (50%)
- Systems analysts

Core ICT practitioners - professional level includes ISCO categories
- Software developers
- Web and multimedia developers
- Applications programmers
- Software and applications developers and analysts not elsewhere classified
- Database designers and administrators
- Systems administrators
- Computer network professionals
- Database and network professionals not elsewhere classified

Other ICT practitioners - professional level includes ISCO categories
- Electronics engineers
- Telecommunications engineers
- Information technology trainers
- Information and communications technology sales professionals

Core ICT practitioners - associate/technician level includes ISCO categories

---

28
1.2 Quantification of the e-leadership workforce

Previous estimates at e-leadership demand and supply in Europe came to the conclusion that Europe sees a demand of about 683,000 e-leaders and a supply of 661,000. Demand estimation was based on the sector and size structure of businesses in Europe, simply assuming that an enterprise of a certain size and in a certain, more or less ICT intensive sector needs on average a certain number of e-leadership skilled employees. Supply estimation was based on occupational data and assumed that a certain percentage of several occupations (such as ICT and R&D executives) are e-leaders.

While the estimations presented a reasonable stab at establishing an order of magnitude of e-leadership in the workforce, its weakness lies in the fact that some of the assumptions made simply rely on educated guesswork. They were discussed at various workshops with experts and stakeholders, but not empirically tested.

To amend this shortcoming, empirica undertook to survey enterprises of the business economy and public sector with the intention to estimate the number of employees that could be seen as e-leaders.

A survey of CIOs carried out in the summer of 2013 was used to pilot methods for exposing e-leadership problems in today’s organisations, i.e. a focus on an organisation’s competence in identifying and addressing opportunities for business innovation using ICT.

As a yet not fully defined phenomenon, e-leadership had to be operationalised so as to be able to communicate to survey respondents whom we look for. Operationalisation of e-leadership was decided to follow the proposition that e-Leadership manifests in successful innovation.

The survey was carried out in the UK, Germany and the Netherlands – the first being the two biggest economies in Europe with the largest ICT labour markets, the Netherlands as regionally close and with a high level of educational activity in the e-leadership domain. Together, these three countries account for 38% of the business economy employment in the EU.

- Information and communications technology operations technicians 3511
- Information and communications technology user support technicians 3512
- Computer network and systems technicians 3513
- Web technicians 3514

Other ICT practitioners- associate/technical level includes ISCO categories
- Electronics engineering technicians 3114
- Process control technicians not elsewhere classified 3139
- Air traffic safety electronics technicians 3155
- Medical imaging and therapeutic equipment technicians 3211
- Medical records and health information technicians 3252
- Broadcasting and audio-visual technicians 3521
- Telecommunications engineering technicians 3522

Forecasts to 2015 were done together with IDC based on demand and supply side modeling.

In total 901 interviews were carried out, across the three countries and across sectors and size classes. The respondent was the head of the IT function in the organisation, in larger organisations usually a CIO. The following tables show the composition of the sample:

**Table 1 – Sample by sector**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing and Construction</td>
<td>220</td>
</tr>
<tr>
<td>Distributive services</td>
<td>231</td>
</tr>
<tr>
<td>Other services incl. Finance</td>
<td>240</td>
</tr>
<tr>
<td>ICT</td>
<td>138</td>
</tr>
<tr>
<td>Public sector</td>
<td>72</td>
</tr>
<tr>
<td>Total</td>
<td>901</td>
</tr>
</tbody>
</table>

**Table 2 – Sample by size class**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 19</td>
<td>73</td>
</tr>
<tr>
<td>20 – 29</td>
<td>67</td>
</tr>
<tr>
<td>30 – 49</td>
<td>92</td>
</tr>
<tr>
<td>50 - 99</td>
<td>96</td>
</tr>
<tr>
<td>100 - 249</td>
<td>142</td>
</tr>
<tr>
<td>250 - 499</td>
<td>151</td>
</tr>
<tr>
<td>500 - 999</td>
<td>116</td>
</tr>
<tr>
<td>1000 - 2499</td>
<td>88</td>
</tr>
<tr>
<td>2500+</td>
<td>76</td>
</tr>
<tr>
<td>Total</td>
<td>901</td>
</tr>
</tbody>
</table>

**Table 3 – Sample by country**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>300</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>301</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>300</td>
</tr>
<tr>
<td>Total</td>
<td>901</td>
</tr>
</tbody>
</table>

The methods were directed at organisations employing ICT staff. Therefore an interview was only carried out if at least one ICT practitioner was employed in the organisation. Incidence of ICT employment is shown in the following table.

**Table 4 – Incidence rates**

<table>
<thead>
<tr>
<th>Quotum</th>
<th>Incidence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Total</td>
<td>18%</td>
</tr>
<tr>
<td>Sample Germany Total</td>
<td>19%</td>
</tr>
<tr>
<td>Sample Netherlands Total</td>
<td>16%</td>
</tr>
<tr>
<td>Sample UK Total</td>
<td>19%</td>
</tr>
</tbody>
</table>
Though incidence rates appear low, these levels were reconfirmed by the survey organisation as being in line with results from other surveys.

### 1.2.1 Addressing innovation opportunities

Key questions in the survey address an organisation’s success in detecting innovation opportunities, both by ICT staff and by business staff. The main issue was whether overall CIOs thought their organisation was performing well in addressing innovation, and whether innovation projects were allocated sufficient resources. Some reports suggest that business innovation projects are left to the IT department, with the implication that these suffer from lack of access to resources in user departments. Furthermore, since many opportunities for innovation require understanding of both business and ICT, innovation opportunities could be detected by business executives, if these have enough understanding of ICT. Two questions therefore looked at the CIO’s view of the innovation capabilities of their organisation as a whole and as identified by their fellow non-IT executives in particular.

Though most CIOs (77%) report that the opportunities for IT-based innovation open to their organisation are being addressed in time and with appropriate resources, a significant minority report that this is not the case. Problems are somewhat more acute in smaller organisations, though the difference perhaps surprisingly small: the proportion of organisations experiencing problems drops from over a quarter of the smaller organisations to under 20% in the largest enterprises.

### 1.2.2 E-Leadership roles in innovation

Ensuring ICT-based innovation opportunities are identified, grasped and guided to fruition requires e-leadership at the different stages in the innovation life cycle. It is seen as particularly critical not only to be able to envision an innovation, and to assess its likely success in the organisation, but also to communicate this vision to executive colleagues controlling the resources impacted by the proposed organisational change. This was operationalised as the performance of two key component e-leadership roles. The first is the role of proposing an innovation project. The success of a proposal was conceptualised as an innovation project resulting from the proposal. Making proposals not leading to a project can be taken as an indicator of failure in e-leadership, having arisen either from inability to assess business outcome appropriately or inability to persuade business colleagues of the probability and value of the business outcome.

A second key component of an e-leadership role is seen as that of guiding an innovation project to success. This is not implementation of an IT solution, nor even managing its implementation, but acting as the client for the innovation project - assessing proposals, monitoring conformance to requirements, accepting results etc., including acting as client for delivery of solutions from outside organisations.

Both these e-leadership component roles are required ensure that innovative IT applications and services are identified and successfully deployed to improve performance and competitiveness.

<table>
<thead>
<tr>
<th>Quotum</th>
<th>Incidence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Total 10 to 49</td>
<td>9%</td>
</tr>
<tr>
<td>Sample Total 50 to 249</td>
<td>20%</td>
</tr>
<tr>
<td>Sample Total 250 plus</td>
<td>34%</td>
</tr>
</tbody>
</table>
To investigate this complex, it was first necessary to ask the respondents to report on recent ICT-based innovation. CIOs were asked about the number of such innovation projects their organisation had engaged in in the recent past, phrased for simplicity as “innovative IT projects”.

Of the organisations surveyed, nearly three quarters reported having initiated / carried out at least one innovation project within the previous year. A further 10% had at least one such project within the last five years. Those unable to report on a project - 7% reported no project at all, while 11% were unable to tell – had to be excluded from further questions and analysis, due to the methodological focus adopted. The average number of innovative ICT-based projects in the previous year is 5.1, the median is 2.

<table>
<thead>
<tr>
<th>Size of enterprise</th>
<th>average number of employees</th>
<th>Innovative IT projects have been proposed by</th>
<th>Number of persons involved in proposing innovative projects using IT</th>
<th>Number of persons acting as project clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 - 19</td>
<td>13.8</td>
<td>Staff from the IT department 51% Staff from other business units 54% External organisations 39%</td>
<td>In the IT department 1.5 In other business units 2.1 In external organisations 1.6</td>
<td>In the IT department 1.3 In other business units 1.4 In external organisations 0.8</td>
</tr>
<tr>
<td>20 - 29</td>
<td>23.2</td>
<td>Staff from the IT department 59% Staff from other business units 52% External organisations 21%</td>
<td>In the IT department 2.0 In other business units 1.8 In external organisations 1.3</td>
<td>In the IT department 1.3 In other business units 1.3 In external organisations 0.4</td>
</tr>
<tr>
<td>30 - 49</td>
<td>37.3</td>
<td>Staff from the IT department 58% Staff from other business units 60% External organisations 25%</td>
<td>In the IT department 1.4 In other business units 2.1 In external organisations 4.4</td>
<td>In the IT department 1.4 In other business units 1.4 In external organisations 0.8</td>
</tr>
<tr>
<td>50 - 99</td>
<td>69.2</td>
<td>Staff from the IT department 53% Staff from other business units 65% External organisations 12%</td>
<td>In the IT department 1.9 In other business units 2.5 In external organisations 0.7</td>
<td>In the IT department 1.5 In other business units 1.8 In external organisations 0.5</td>
</tr>
<tr>
<td>100 - 249</td>
<td>153</td>
<td>Staff from the IT department 56% Staff from other business units 64% External organisations 22%</td>
<td>In the IT department 1.9 In other business units 2.9 In external organisations 1.1</td>
<td>In the IT department 1.4 In other business units 2.0 In external organisations 0.5</td>
</tr>
<tr>
<td>250 - 499</td>
<td>342</td>
<td>Staff from the IT department 65% Staff from other business units 76% External organisations 24%</td>
<td>In the IT department 2.9 In other business units 5.0 In external organisations 0.7</td>
<td>In the IT department 1.7 In other business units 2.7 In external organisations 0.4</td>
</tr>
<tr>
<td>500 - 999</td>
<td>667</td>
<td>Staff from the IT department 72% Staff from other business units 73% External organisations 27%</td>
<td>In the IT department 3.9 In other business units 4.5 In external organisations 0.8</td>
<td>In the IT department 2.4 In other business units 3.6 In external organisations 1.1</td>
</tr>
<tr>
<td>1000 - 2499</td>
<td>1420</td>
<td>Staff from the IT department 65% Staff from other business units 83% External organisations 14%</td>
<td>In the IT department 4.9 In other business units 5.5 In external organisations 1.5</td>
<td>In the IT department 2.3 In other business units 4.3 In external organisations 0.5</td>
</tr>
<tr>
<td>2500+</td>
<td>9633</td>
<td>Staff from the IT department 75% Staff from other business units 77% External organisations 34%</td>
<td>In the IT department 5.0 In other business units 13.7 In external organisations 7.3</td>
<td>In the IT department 4.2 In other business units 8.7 In external organisations 1.2</td>
</tr>
<tr>
<td>Total</td>
<td>1030</td>
<td>Staff from the IT department 62% Staff from other business units 68% External organisations 23%</td>
<td>In the IT department 2.7 In other business units 4.0 In external organisations 1.8</td>
<td>In the IT department 1.8 In other business units 2.7 In external organisations 0.7</td>
</tr>
</tbody>
</table>

The second feature addressed was the locus of proposed innovation. Are successful innovation proposals flowing in from business units – a sign of at least adequate understanding of the options for ICT exploitation alongside business understanding – or are such proposals mainly generated from the CIO or IT staff working under the CIO? Or does the organisation respond to vendor proposals, proposals coming from outside without direct access to organisation-specific demand detail?

The picture is surprisingly mixed. Successful innovation project proposals are balanced in origin between business and ICT executives. Successful proposals have been proposed equally from within and outside the IT department. About two thirds of organisations with recent ICT-based innovation state each origin. Vendor or other external impetus is also very prevalent, being mentioned by about a quarter of innovative organisations.

The number of persons involved increases only slightly with enterprise size, so that a much higher share of employees in the enterprises are actually involved in smaller enterprises (up to 25% in the smallest class), while larger ones have a specialised innovation labour force:
### Table 6 – Staff involved in proposing and as clients of IT projects

<table>
<thead>
<tr>
<th>Enterprise size class</th>
<th>% of staff involved in proposing IT projects</th>
<th>% of staff involved as project clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 - 19</td>
<td>25.4%</td>
<td>19.5%</td>
</tr>
<tr>
<td>20 - 29</td>
<td>16.5%</td>
<td>11.5%</td>
</tr>
<tr>
<td>30 - 49</td>
<td>9.6%</td>
<td>7.5%</td>
</tr>
<tr>
<td>50 - 99</td>
<td>6.3%</td>
<td>4.9%</td>
</tr>
<tr>
<td>100 - 249</td>
<td>3.1%</td>
<td>2.2%</td>
</tr>
<tr>
<td>250 - 499</td>
<td>2.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>500 - 999</td>
<td>1.3%</td>
<td>0.9%</td>
</tr>
<tr>
<td>1000 - 2499</td>
<td>0.7%</td>
<td>0.5%</td>
</tr>
<tr>
<td>2500+</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Total</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

It is interesting to see that the relation between IT staff and non-IT staff involved in driving IT based innovation is rather constant at 40/60, both in terms of initiation (proposing, 2.7 IT staff and 4.0 Non-IT staff) and implementation (acting as client, 1.8 IT staff and 2.7 Non-IT staff).

While the survey only addressed three countries, we experimentally applied the results of the three countries to the known business structure according to size class (but not industry) of the whole of Europe (EU28). The following e-Leadership quantification emerges from grossing up from DE, NL and UK to EU28.

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The countries in the survey account for 38% of the employment in the European Union. Scaling up the result to the European Union should also require taking account of sector differences between these countries and the remaining 25 Member States but due to the limited number of cases and inconclusive variance between sectors and it seemed reasonable to restrict adaptation to size class structure only. Given the sector structure difference between the whole of Europe and the countries covered, the true value might be somewhat lower.
The order of magnitude of the European e-Leadership workforce can thus be estimated to lie between 570,000 and 800,000 workers. The previous estimate of 660,000 to 680,000 e-leaders has not been out of range.

1.2.3 Forecasting demand

With demand established to be in the range of 568,000 to 802,000 for 2013, forecasting for e-leadership demand must rely on estimated growth rates as little market data for e-leadership vacancies or future hiring is available. We use an analogy to the most highly skilled ICT positions, for which such estimations exist. IDC and empirica have forecast demand for highly skilled ICT occupations\(^8\) to rise by on average 4.6% until 2020\(^9\). It seems reasonable to assume that demand for e-leadership is closely coupled with highest skilled ICT jobs.

Demand in 2015 is estimated to be in range of 620,000 to 875,000 by applying a 4.6% growth rate and estimated to grow to a range of 776,000 to 1,096,000 in 2020.

Taking account of expansion (new jobs) demand and replacement (because of retirements etc.) demand, Europe will so need between 200,000 and 350,000 additional e-leaders by 2020, or between 40,000 and 70,000 per year.

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\(^8\) ICT management, architecture and analysis skills. Demand for these jobs is forecast to rise from 1.94 million (2013) to 2.65 million (2020).

Figure 18 – e-Leadership forecast
2 The European Guidelines and Quality Labels

2.1 Guidelines and Quality Label – An Overview

The following sections present the Guidelines and Quality Labels for new curricula fostering e-leadership skills in Europe.

The first sections present the Guidelines and Quality Labels respectively. A subsequent section describes the development method alongside the starting points researched for the process.

A central element of the Guidelines on fostering e-Leadership in Europe is a portfolio of e-Leadership Curriculum Profiles. The new concept of a Curriculum Profile is to capture the essential elements of any educational offer qualifying for e-leadership positions, in particular by specifying key learning outcomes. Those successfully completing a course of education compliant with a Curriculum Profile are expected to exhibit top performance in key e-leadership roles in the economy.

Curriculum Profiles are to have concise learning outcomes and to be mapped for transparency to the emerging standard European e-Competence Framework e-CF. Learning outcomes for a Profile are identified through analysis of the responsibilities and benefit delivery expected of the role. Experts in delivering best-practice programmes specify critical elements of the learning experience for successful delivery of the defined learning outcomes.

The portfolio of Curriculum Profiles is to reflect the sets of e-Leadership competencies required in a modern economy, and the portfolio is to increase transparency in the vast and increasing offer of programmes and courses by institutions of higher and executive education in Europe. Curriculum Profiles can be referred to by higher/executive educational institutions (HEEIs) wishing to new curricula or adapt educational offers delivering e-leadership skills. Given compliance, they can be used as reference for positioning existing educational offerings.

The Quality Label is to be a tool for supporting the development, demonstration and dissemination of new curricula fostering e-leadership skills. Starting point for the label are specific quality criteria for educational offers that aim at enabling e-leadership performance of individuals. The adoption of widely agreed quality criteria when awarding a label for e-leadership education is expected to help to increase transparency for potential learners and their employers as well as their trust in what they get for their investment in e-leadership education programmes.

The Quality Label is designed to assure that education in e-leadership through a designated programme:

- contributes sustainably to the acquirement of e-leadership skills and competences when successfully completed.
- is regularly and effectively aligned to the needs of present and future employment and entrepreneurship markets as well as to predictable developments in science and technology.
- is continuously improved including the relevant stakeholders from the point of view of the offering institution - at least teachers, learners and profession/employers.

Starting point for the Quality Label is the market demand for e-Leadership competency, the learning outcomes of education and training that enable the learners to be successful in an e-Leadership role. This aspect of the Quality Label makes use of the new e-Leadership
Curriculum Profiles. In this way the Curriculum Profiles offer a reference for the quality ambitions of a programme or course. They are not intended to represent a complete set of quality criteria appropriate for the e-leadership curriculum quality label. These criteria have been developed in all of three key quality domains: market demand, academic rigour and transparency.

The requirements for curriculum profile content, the design of curriculum profiles and of the portfolio of such, and the design of the proposed quality label are described in the following sections in more detail.

2.2 Guidelines for e-leadership curriculum profiles

Introduction

Stimulating new curricula for programmes offered by higher and executive education institutes (e.g. universities and business schools) is to ensure an adequate flow of the e-leaders required to generate innovation in the European economy. The approach capitalized on best practice and successful e-leadership curricula.

e-Leadership curriculum profiles define programme learning outcomes which are a set of the e-leadership skills and competences in demand in a modern economy. They form a central part of the European guidelines for new curricula fostering e-leadership.

A curriculum profile constitutes a subject-specific, content-oriented reference framework suited both for the development of an educational offer, as well as for understanding, comparing and assessing educational offers.

Scoping the guidelines

The scope of curriculum profiles for e-leadership is set by the focus on e-leadership skills delivery for accelerated innovation, competitiveness, growth and employment. This scope is fully in line with previous work.

According to the definition in CWA 16234-2 e-leadership can be specified as the capability:

- to exploit opportunities provided by ICT, notably the Internet;
- to ensure more efficient and effective performance of different types of organisation;
- to identify, explore and take advantage of possibilities for new ways of conducting business/administrative and organisational processes;
- and/or to establish new businesses.

An important additional input was provided by the INSEAD report on e-Leadership, which defined a set of personal achievements rather than business outcomes:

- Managing change and inventing
- Developing a compelling vision
- Building and aligning relationships across boundaries
- Making sense of a situation/ experimentation

Stakeholders at a project workshop assessed the INSEAD and CWA approaches and combined the two into a succinct description of e-leadership skills This remains centred on
innovation outcomes and also highlights features of individual leadership - vision, initiation, guidance to success.

e-Leadership skills are described as a set of competences (knowledge, skills and attitudes) which an individual in the modern economy requires to initiate and guide innovation utilising ICT and includes the skills to lead qualified staff from different disciplines:

- towards identifying and designing business models and
- exploiting key innovation opportunities,
- making best use of developments in ICT and
- delivering value to their organisations.

The core skill elements, including the business and personal perspectives, to be addressed by an e-leadership curriculum can be described as follows. The description of an "e-Leader" is of someone who leads inter-disciplinary staff and builds the capability to:

- Innovate strategic business and operating models
- Exploit digital trends
- Envision and drive change for business performance and
- Influence stakeholders across boundaries (functional, geographical)

Requirements for curriculum profile design

The design of curriculum profiles also sets out from the premise that a learning process is more likely to deliver the defined learning outcomes if it is part of a properly designed programme implementing a coherent curriculum.

An e-Leadership curriculum profile is not intended to replace the documentation normally provided by educational institutes, e.g. in brochures or on their web site. Instead, the profile is to offer a concise overview of the curriculum, with a focus on the benefits for the attendees in case of successful completion.

Requirements for curriculum profiles include that the profile should

- be informative for stakeholder organisations in their selection of executive training and in their hiring decisions and for this, contain essential learning outcomes for important e-leadership roles, ("profile learning outcomes")
- be inspiring to HEEI with new ideas and research in the field, minimise the level of prescription to HEEI (while remaining informative to stakeholder organisations), in particular, not contain all the information which an HEEI would publish on a programme in a brochure / on the web
- show clear benefits for students / alumni
- be free of intellectual property rights

A curriculum profile should not contain details that should remain specific to the higher education institute offering compliant programmes. These include the way learning outcomes are assessed, teaching methods and formal admission requirements.

While accepting the value of differentiation of educational offers and their openness to local initiative and innovation, supported by autonomy in the decisions of higher education institutions, the curriculum profiles are to contribute to making educational offers in the field of e-leadership comparable from an outside perspective, from the perspective of those
wishing to improve their e-leadership skills and those looking for improved e-leadership performance in their organisation.

A curriculum profile also does not reflect quality aspects of the institution, like personal experience of the teachers or internal quality assurance procedures.

Nevertheless, a curriculum profile covers essential quality criteria for an educational programme capable of delivering e-leadership capability, including:

- the reflection of demand in large enterprise for e-leadership performance;
- the application of academic rigour - this refers to the quality of the educational institute and its staff, e.g. the academic standards assuring the curriculum to be at Master’s level;
- provision of transparency in the market for related educational offers

**The structure of a curriculum profile**

In meeting the requirements set, key features of a curriculum profile are:

- core learning outcomes
- mapping to the e-CF
- required e-leadership understanding

At the centre of a curriculum profile is the set of learning outcomes to be achieved. In this way learning outcomes, i.e. statements of what a learner knows, understands and is able to do on completion of a learning process, are a central element of all e-leadership curriculum profiles.

A standard taxonomy, based on Bloom, is used for learning outcome definition. Succinct descriptions of learning outcomes are not easy to create with the necessary high rigour and capturing all elements of relevance. To systematise the approach, a hierarchy of skills was applied to learning outcome specification, using an updated view of Bloom’s taxonomy. The verbs prescribed for a learning outcome specification, from high-order to low-order skills are: create, evaluate, analyse, apply, understand and remember.

As an example, the learning outcomes of an educational programme implementing a curriculum in Business and Enterprise Architecture might be specified such that on successful completion of the programme, the then business architect will be able to:

- Create architectural designs that help innovate strategic business and operating models
- Exploit digital trends to develop target model architectures
- Envision and drive architectural change for business performance
- Influence architectural stakeholders across boundaries
- Build architectural capability and lead inter-disciplinary staff

In addition to transparency of learning outcomes, transparency is additionally provided by mapping learning outcomes to the European e-Competence Framework (e-CF).

Both the notion of learning outcome and competency are related to the educational experience, the learning process:

- Learning outcomes are statements of what a learner can be expected to know, understand or do after successfully completing the learning process
e-Competencies are statements of what competences a student is expected to possess after successfully completing the learning process.

A curriculum profile contains a number of topics referred to as e-leadership understanding, which are referenced to competencies in the e-CF. In most cases the ability to act effectively in an e-leadership role also requires a good understanding of related areas. As an example, a Lead Business Architect will not need to be an e-leader in shaping the business strategy, but obviously would need to be able to contribute, and critically appraise work done to develop the strategy. In terms of the (revised) Bloom taxonomy, the knowledge and understanding of the topic IS and Business Strategy would need to be at least at the level of ‘evaluating’ (level 5).

Guidelines for constructing curriculum profiles

In creating curriculum profiles requires the following steps to be taken:

- Identify a core set of skills expected to be required from all e-leadership programmes
- Translate the core skill set into learning outcomes for a sample role
- Provide a complete curriculum profile for a sample role

A profile should be the result of consultation between qualified academics and industry. After consultation, the approach was refined in a number of ways.

The following are some practical guidelines in the effective mapping of the learning outcomes to the e-CF:

1. Document the details of the curriculum, like the title, short description, target group and prerequisites
2. Establish the main subjects in the curriculum. This often requires overviewing all modules and providing a high level description to keep the number of subjects below, say, 10 items.
3. Go through the list of e-competences and select those that seem to be covered by the curriculum (based on the information obtained so far in the previous steps)
4. Carefully compare the description of each e-competence in the e-CF with the evidence collected on the curriculum: Is there evidence at all the competence is covered?
5. Establish for every assigned competence the level at which it is covered by the curriculum by carefully comparing the level descriptions in the e-CF.

Users should note that as a result of this procedure, probably several competencies, referring to be important in the curriculum, will not be at level 4 or 5 for all graduates of the course. Several of these may however find their way into the list of topics of e-leadership understanding needed in for the typical multi-disciplinary background required for e-leadership roles. Also some learning outcomes (knowledge, skills, competencies) might remain “unmatched”, where no corresponding e-competence has (yet) been defined within the e-CF. If such learning outcomes are regarded as relevant to the e-leadership skill set under design, they can be included under the Main Topics heading.
Guidance for a portfolio of curriculum profiles

Though each curriculum profile is designed to specify adequately programmes of education which can deliver a full set of e-leadership skills, just one such profile is not adequate to the task. Instead, these guidelines suggest that flexibility, dynamic adaptation and coverage of the range of e-leadership roles there are is best achieved by maintaining a portfolio of such profiles. On this approach the portfolio of curriculum profiles should meet a number of requirements:

- The portfolio of curriculum profiles should as a whole cover all sets of learning outcomes which make up e-leadership
- There are to be no blocks to differentiation based on innovative approaches, allowing that two profiles may overlap in terms of learning outcomes. To meet this requirement it should be possible for educational institutions to propose an additional profile
- A new profile must be accepted as a valuable addition to the portfolio from the point of view of employing (demand-side) stakeholders. To this end an executive organisation might be engaged by stakeholder organisations to organise profile vetting and acceptance. The organisations in question would be any employing organisation expecting to commission executive training or hire staff whose performance would be more valuable with e-leadership skills.

Proposals for e-leadership curriculum profiles can continue to be based on existing higher education programmes. Here the basic information - rationale, sample roles, related ICT-trends and main topics - can often be easily extracted from existing documentation.

The current guidelines focus on e-leadership in large enterprise. As the concept of e-leadership is extended, the following segmentation of e-leadership roles may be useful: executive, professional and entrepreneur types of e-leadership. For each, skills are related to deliverables to expose the opportunities for defining learning outcomes:

- e-Executives – evaluate and create business outcomes – typically C level
- e-Professional Leads – enable business outcomes by creating enabling solutions
- e-Entrepreneurs – create and evaluate new digital businesses

Presenting conformant programmes

Today, a web platform is the chosen vehicle to provide information widely at low cost. Here, the provision is to be of trustworthy information about the quality of educational offers relevant for e-leadership performance and behaviour of individuals all over Europe.

It is suggested that institutions can publically present their e-leadership education and training within a web-based register. Compliant institutions would undergo and document regular self assessments against curriculum profiles.

An entry in the register would be the result of self-assessment plus approval be the governing board for e-leadership education. A programme may also acquire a quality label, which would be recorded in the register.
2.3 Quality labelling for e-leadership programmes

Introduction

A quality label for e-leadership programmes has been developed, to complement the guidelines on curriculum profiles and to further strengthen the drive for new curricula fostering e-leadership in Europe.

The adoption of widely agreed criteria for awarding a quality label for e-leadership education is to help increase transparency for potential learners and their employers as well as their trust in what they get for this further investment in their education.

The quality label is proposed as complementary to self-initiated registration and approval of programmes evaluated by the educational institution against an approved e-leadership curriculum profile. The requirement is to support the improved functioning of the e-leadership ecosystem, acting as an additional communication tool between stakeholders. Both registration/ approval and quality label can act as a bridge between market demand and specific courses provided by institutions.

Curriculum profiles in conjunction with the quality label aim at improving links between the professional world and higher education in order to facilitate and accelerate delivery of higher education and training which enhances the e-leadership performance of individuals.

The outcome of an e-leadership educational programme comprises the knowledge, skills and competences each individual participant gains through it - the flow of participants achieving the learning outcomes of interest, e-leadership skills. Where the relevant learning outcomes are obtained by participants on successful completion, these alumni will prove able to sustainably deliver e-leadership performance.

The relevance of the learning outcomes achieved to performance in e-leadership in public and private office is ensured primarily by the processes of design of curriculum profiles. For optimal outcome, profile and educational offer should be regularly and effectively aligned to the anticipated e-leadership needs in employment and entrepreneurship. Thus effective processes of designing, running and enhancing educational offers are critical.

A major concern with the idea of a new, specialized quality label is the possible creation of isolated label procedures in parallel with existing national or international external quality assurance solutions. Such a parallel structure would signify inefficiency and additional cost for education institutions. Different – compulsory and voluntary – external assessments are carried out for different reasons but process similar data and using similar instruments in large part.

The quality assurance approach proposed is to bring as much transparency as possible while burdening educational institutions as little as possible in terms of resources. At the same time the approach is to be aligned to best practice of external quality assurance in education systems, including evidence based decision taking, not-negotiable reference criteria, independent third party assessment, on site visits and peer review.

The quality claim

A necessary baseline for the definition of any quality label is a clear claim to compliance with a defined set of quality criteria. In the current context, this claim should be in essence that an educational offer enables excellent e-leadership performance by those completing the education. An appropriate claim (this has been negotiated with key stakeholders) is:
Award of the Quality Label for Education and Training in e-Leadership confirms for the designated course or programme, that
(a) on successful completion a participant possesses a set of skills (e-leadership skills) that fully or partially correspond to the learning outcomes published in a e-Leadership Curriculum Profile, which is aligned to current and anticipated skill requirements for e-leadership in public and private office;
(b) effective continuous improvement processes are in place to take notice of and respond fully in a timely manner to
   (i) research findings relevant to teaching and delivering e-leadership skills;
   (ii) experience of teaching staff and participants.

Claims to quality are effectively made at two levels, the level of processes of crafting the individual curriculum profiles, and the level of the specific conformant programme offered by and educational institution. The quality label proposed applies to the second level. The quality of the first process is to be assured by proper governance of the generation and approval process. This portfolio process should include formal recognition of each profile, including using mechanisms for taking account of feedback from employers and alumni about the profile. The particular focus is on quality criteria related to intended learning outcomes. The latter quality level applies to claims made additionally by the educational institution. The focus here is on quality criteria associated with the delivery of actual learning outcomes.

To address the transparency goals set, the quality label is based on:
- curriculum profiles for e-leadership which define what the market demands plus
- criteria that define how demands are assured through academic rigour
- open communication and compatibility with industry frameworks to ensure transparency

**Building on curriculum profiles**

The quality label for e-leadership education builds on the curriculum profiles. A curriculum profile constitutes a subject-specific, content-oriented reference framework suited both for the development of an educational offer, as well as for understanding, comparing and assessing educational offers. Current profiles are designed to be complied with not by a single course or module but by an offer of a comprehensive series of modules in a formalized study programme. The relevant quality criteria could also be used for the assessment of single modules, given an appropriate curriculum profile.

The quality label approach focusses on evidence for the sustained, wide delivery of the learning outcomes defined in a curriculum profile.

In line with the guidelines, in defining quality criteria, these should allow educational intitutions to develop different solutions in terms of specific educational offers - this should be independent of whether they are grouped in a number of single courses, modules or presented in a complete programme. At the same time, the quality criteria applied should ensure the claimed curriculum profile is complied with, so that this can perform as reference to compare the variety of solutions offered by educational institutions.

Questions relating the the quality criteria centre on the issue as to whether the specific educational offer, the series of modules / programmes presented, complies with the selected reference curriculum profile, in particular covers the learning outcomes presented there. However, beyond this central content compliance criterion, criteria for the quality label also
cover quality assurance processes expected to be in place to ensure intended learning outcomes are achieved in the maximum number of participants in a programme.

**Continuous improvement at two levels**

It is well understood that in order to maintain a high quality of programme outcome, an educational offer should be continuously improved. It is also undisputed that such improvement processes should include all relevant stakeholders, that is, teachers, learners and employers or leading professionals. The approach to quality assurance must also be compatible with the autonomy of higher education institutions to make their own decisions on structure and processes. The autonomy includes decisions to respond rapidly, with delay or not respond to requests and expectations of its stakeholders.

Given the new instrument of curriculum profiles, this continuous improvement takes place at two levels:

- adaptation of curriculum profiles and updating of the portfolio
- application of continuous improvement at the level of educational institutions

In awarding a quality label to a programme, this second level is applicable. External criteria are applied, and responsiveness to stakeholders is assessed positively where the interests pursued by stakeholders are aligned to sustainable delivery of e-leadership performance.

**Quality principles**

The internal logic of the quality criteria and requirements is built upon the questions

- **what** learning outcomes are intended to be delivered with an individual educational offer,
- and consequently **if** these learning outcomes are achieved by a satisfactory number of learners
- and **what** the education institution does for delivering and ensuring what is promised?

Therefore “**mission critical**” requirements presented within the quality criteria for the assessment of and the quality label for e-Leadership education are the following:

- **Compatibility of the intended learning outcomes** of a module / series of modules or programme with typical **e-Leadership skills** (Innovate strategic business and operating models, Exploit digital trends, Envision and drive change for business performance, Influence stakeholders across boundaries).

- **Compatibility** of the intended learning outcomes of a module / series of modules or programme with at least one **e-Leadership curriculum profile**

- Reflection of the education institutions’ specific potential to contribute to e-Leadership education according to its mission and strategy.

- With regard to methods and didactics: adequate **possibility for learners to exercise professional practice** related to the intended e-leadership performance and behaviour integrated in the course / module / programme.

- With regard to staff resources: **personal experience** with science on and or performance and behaviour of e-leaders in professional life present **among the teaching staff**.
With regard to enhancement and quality processes for the individual educational offer within an education institution: an efficient, effective and sustainable process / mechanism for **identifying, handling and taking into account**

- ICT-related trends in science and economy,
- needs of potential employers,
- needs of potential and present learners and teachers / professors,
- when defining intended learning outcomes as well when developing a new offer focussing on e-leadership or when internally assessing and improving an existing one.

**A set of quality criteria for the quality label**

The following proposed quality criteria for the award of a quality label on e-leadership education are grouped according to the agreed categories of

- Market demand
- Academic rigour and
- Transparency

The table below shows the topics on which quality requirements are set for achieving a label as well as the related criteria and descriptors in the curriculum profile template:
<table>
<thead>
<tr>
<th>Criterion*</th>
<th>Corresponding field Curriculum Profile template</th>
<th>n*</th>
<th>Topics on which quality requirements are set for the quality label on e-Leadership education</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD + AR + T</td>
<td>Learning Outcomes</td>
<td>n. a.</td>
<td>Objectives, Content and their Applicability</td>
</tr>
<tr>
<td>MD</td>
<td>Rationale</td>
<td>n. a.</td>
<td>Intended learning outcomes</td>
</tr>
<tr>
<td>MD</td>
<td>Sample Roles</td>
<td>n. a.</td>
<td>Needs of stakeholders</td>
</tr>
<tr>
<td>AR</td>
<td>Core Content</td>
<td>n. a.</td>
<td>Labour market applicability</td>
</tr>
<tr>
<td>AR + T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Content (curriculum / syllabus)</td>
</tr>
<tr>
<td>AR</td>
<td>Learning Experience</td>
<td>n. a.</td>
<td>Methods and Didactics</td>
</tr>
<tr>
<td>AR</td>
<td>Learning Experience</td>
<td>n. a.</td>
<td>Admission requirements</td>
</tr>
<tr>
<td>AR</td>
<td>Learning Experience</td>
<td>n. a.</td>
<td>Teaching methods and didactic approach</td>
</tr>
<tr>
<td>AR</td>
<td>Learning Experience</td>
<td>n. a.</td>
<td>Examination methods</td>
</tr>
<tr>
<td>AR</td>
<td>Learning Experience</td>
<td>n. a.</td>
<td>Learning Environment: Structures, Organisation and Support</td>
</tr>
<tr>
<td>T</td>
<td>Learning Experience</td>
<td>n. a.</td>
<td>Structure of the education offer</td>
</tr>
<tr>
<td>AR</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Work Load</td>
</tr>
<tr>
<td>AR</td>
<td>Learning Experience</td>
<td>n. a.</td>
<td>Organisation of learner assessment (exams)</td>
</tr>
<tr>
<td>AR</td>
<td>Learning Experience</td>
<td>n. a.</td>
<td>Support and assistance of learners</td>
</tr>
<tr>
<td>AR + MD</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Resources</td>
</tr>
<tr>
<td>AR</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Staff</td>
</tr>
<tr>
<td>AR</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Institutional setting, funding and equipment</td>
</tr>
<tr>
<td>T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Development and Enhancement of the module / course / programme</td>
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<tr>
<td>T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Quality assurance – processes and results</td>
</tr>
<tr>
<td>MD + T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Involvement of learners and teachers</td>
</tr>
<tr>
<td>MD + T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Involvement of profession / employers</td>
</tr>
<tr>
<td>MD + T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Alignment to developments in science and technology</td>
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<td>T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Documentation and Transparency</td>
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<tr>
<td>T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Legal relationship with learners, rights and duties</td>
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<tr>
<td>T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Relevant documents</td>
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<tr>
<td>T</td>
<td>n. a.</td>
<td>n. a.</td>
<td>Certificate upon conclusion</td>
</tr>
</tbody>
</table>
Label award procedure

To complete a quality assurance procedure, the self-assessment documentation / report of a education institution together with the evidence material in a second step is reviewed by a group of independent, external experts who document their analysis and conclusions if and how far the quality criteria and requirements are met. This external assessment can

- either be executed paper based (minimum requirement)
- or include an on-site audit by the independent experts for visiting facilities and direct exchange with management, teachers, learners and other stakeholders of an education offer (standard requirement).

External assessment increases credibility while allowing the offering institutions to keep part of the evidence confidential, accessible only to the independent external peers. Furthermore it allows a detailed expertise-based feedback on a range of quality relevant aspects of an education offer, including expert recommendations that support continuous improvement.

Efficient assessment

Higher education institutions in Europe at present mandate regularly external assessment and certification procedures of different kinds e.g. for satisfying requests by national bodies or by international networks they belong to, for marketing reasons and or for aligning with professional and scientific standards within the respective professional/scientific communities.

When applying for a higher quality level or the quality label for e-leadership education, the providing institution will be asked to bring forward the results of other accreditation / certification procedures already gone through.

Thus two types of procedures are at disposal:

1. “piggy-back”-procedures relay on other external assessments or certification procedures of interest for the education institution offering e-leadership education. The responsible body or agent reviews each case brought to its attention and decides individually if and how far the attribution of a quality label can build upon the existing assessment results or to what extend additional checks need to take place.

2. “stand-alone”-procedures executed for the attribution of a quality level and or label would not rely on existing external quality assurance initiatives and their results.

Roles in the quality process include:

- Programme Agent: an authorised representative of the educational institution offering the programme for which a quality label has been applied for.
- Assessment Agent: an independent third party recognized by the quality label owner as expert in quality assessment and acting in quality assessment processes as authorized agent of the label owner. The quality assessment agent will typically manage an assessment process with the result of a recommendation to the label owner for label award
- Expert Agent: an (academic) expert, independent of the educational institution offering the programme for which a quality label has been applied for, who has good
understanding of the subject matter of the education and of appropriate and effective teaching methods for this subject matter. Such an expert agent may be engaged directly by the label owner or by the quality assessment agent.

An authorised agent may offer combined external assessment and certification procedures to providers leading to different results and seals — among those the attribution of a quality level and or label. In any case the final decision on the attribution of a higher quality level (including the award of the label) is taken autonomously by the responsible owner body or by authorised agents and regardless if other labels and certificates were, are or would be awarded.

The evidence assessed in the process will include:

- Certificates, reports and other documents generated by previous accreditation / certification procedures which third parties can be given access to
- Observations of management, academic staff and other staff at the educational institution which can be elicited by interview by a third party, e.g. by assessment agent or expert agent.
- Processes at the educational institution which can be made accessible to observation by third parties, e.g. by expert agents.

**Governance of quality label award**

For governing the quality labeling system a series of functions need to be allocated in a sustainable institutional setting — such as an organisation generating legal status and sustainability, a permanent management structure, a finance model / business case for sustaining the management structure and processes as well as non-for-profit bodies, a permanent body constituted by stakeholder representatives from academia and professional world with experience in education and performance of e-leaders responsible for regularly revising the quality criteria, deciding on the attribution of a quality level and the quality label, authorizing third parties / bodies to decide on the attribution of a quality level and the quality label, eventually authorised agents entitled to act in the name of the responsible body / “owner” in deciding about the attribution of a quality level including the quality label for e-Leadership education.

2.4 Gaining feedback from alumni e-leaders

2.4.1 Introduction and rationale

Guidelines have been developed to help educational institutions engage with and learn from alumni in the long-term and identify opportunities to develop an even more employable and enabling portfolio of competences for future participants. More specifically, these guidelines are intended to help education institutions develop their own systematic process for engaging with alumni to track demands for and benefits associated with having an e-leadership portfolio of competences. These guidelines were developed by Nils Fonstad (INSEAD)\(^{10}\) and Jette Lundin (It-vest)\(^{11}\) and successfully piloted with alumni from the Masters

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\(^{10}\) During this project, Nils Fonstad was Associate Director at INSEAD. As of July 1, 2014, he is a Research Scientist at the MIT Center for Information Systems Research (MIT CISR).
in IT Program within It-vest (Denmark), several months or years after individuals had participated in one or more modules provisioned by It-vest.

Long-term evaluations of alumni provide insights from the perspective of both their experience in the program and their professional experience since the program:

- Overall, many educational programs collect feedback from participants immediately at the conclusion of an educational module and/or program. However, few if any engage with alumni several months (or years) after they participated in a program. The following guidelines are intended to complement short-term efforts to collect feedback from participants.
- An advantage of a long-term evaluation – i.e., an evaluation of a program several months or years after having participated – is that participants can be asked for their own perceptions of the impact of their participation on their careers and responsibilities as well as for recommendations based on both their professional and academic experience for making the program even more relevant.
- These guidelines provide a way for education institutions to complement immediate evaluations by systematically engaging with alumni in the long-term.

2.4.2 Guideline overview

The guidelines are organized into four interrelated types.

1. **Content Guidelines** are recommendations for what kinds of questions to include in the survey;
2. **Design Guidelines** offer advice on how to structure the questions and the survey;
3. **Process Guidelines** consist of proposals for conducting the survey; and
4. **Meta Guidelines** are suggestions for enhancing the broader context in which the survey takes place.

2.4.3 Content Guidelines

1. Include a set of questions that enables key types of alumni to be identified and compared. What are the most important differences amongst your alumni, especially with regards to their needs from an educational program such as the one they participated in? Although there are many different types of participants in the Masters of IT Program, we focused on the following 6 types, based on 2 dimensions that we believed were most salient.
   a. Which of the 3 tracks they were participating in (i.e., Software Construction; Interaction Design and Multimedia; and Organisations); and
   b. Whether or not they have earned a Masters degree.

2. Include multiple ways to define and identify e-leaders. One of the most salient findings from this project was that there are multiple ways to define an “e-leader” and each will lead to a different (although not necessarily conflicting) set of insights. This is consistent with the breadth, variety, and subjectivity of definitions of leadership. Some definitions of leadership are based on formal power and consequently rely on the formal role and position of a person

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11 We are grateful to Tina Jensen for her help with the analysis of the survey data.
relative to others, as well as how many employees a person is responsible for. Other definitions are based on what a person has accomplished and rely on aspects such as the extent to which a person practiced specific capabilities, such as expertise in developing applications, expertise in business services, and developing a compelling vision. One of the objectives of this survey was to learn how participants from the Masters in IT Program became e-leaders. We discovered that there are different types and degrees of e-leaders. Appendix 3 describes in greater detail the various approaches we took to defining e-leaders.

3. Include multiple ways to estimate impact (rather than rely on a single question).
   a. Ask questions that enable comparisons of the conditions of participants before and after participating. We asked participants to estimate the percentage by which their salary changed during the time they worked before and after participating in the program. We also asked them to describe their responsibilities at work before and after participating in the program.
   b. Ask participants to estimate what percentage of any changes in their conditions was due to having participated in the program. There are several factors that could contribute to changes in conditions from before participating in a program to after. We asked participants to estimate what percentage of any change in their salary was due to having participated in the Masters of IT Program.
   c. Ask alumni to describe in their own words the benefits of participating in a program. We asked survey participants to describe in 1-2 sentences the impact(s) (if any) that participating in the Masters of IT Program had on them. This enabled us to capture benefits that were specific to individual and their circumstances, as well as benefits that we did not anticipate.
   d. In addition to inquiring about the benefits of participating in the program, inquire about the barriers and costs of participating in the program.

4. Keep the survey focused on gathering the absolutely essential data necessary to answer 3-4 core questions. Craft as small yet as diverse as possible a set of questions to collect sufficient data within 15 minutes. Throughout the process of developing the survey with It-vest, it was a constant negotiation between all the participating stakeholder groups to avoid expanding the set of core questions beyond 4 and to maintain the questions in the survey focused on only those that were absolutely necessary to address the set of core questions. Throughout the process, many excellent (as well as very poor) questions were proposed to collect very interesting data. However often, we had to prioritize. If a new question was going to be included, then an older one had to be removed, in order to maintain the survey at 15 minutes.

2.4.4 Design Guidelines

1. Include the most important questions at the front of the survey. What if someone only completes half the survey? Ideally, the survey will be designed in such a manner that even those who completed half the survey have provided useful data.

2. Taylor questions to capture different types of participants yet ensure there are enough common questions to control for different types of participants.
A participant’s choice of track signalled what general type of professional career s/he was keen to develop (developing software; designing digital interactions; or managing information systems)
3. Try to have participants both select a range (e.g., indicate a percentage or use a Liker scale) and indicate the relative importance of an option; Avoid soliciting binary responses (e.g., Yes/No). In the survey, rather than ask whether a participant’s salary changed, we asked the participant to estimate by what percentage their salary changed. In several questions, we asked participants to distribute 30 points across multiple choices. That way, we could identify both whether or not an option was viable, and if it was, how it compared to the others.

2.4.5 Process Guidelines

1. Piloting a survey is essential – to ensure both that the survey operates and flows correctly and that participants are interpreting the questions and providing responses consistent to what was intended.

2. Also pilot test the heading and invitations to ensure they are making participating in the survey as attractive as possible. Respecting the Danish culture of being very direct, we kept the invitation very short and to the point. We also emphasized the value of participating to the recipient.

3. Adjust the timing of the survey and reminders to the work rhythm of participants.
   Accommodate the availability of participating in the survey to the schedules of alumni.
   a. We started the survey on a Tuesday, because from past experience, we knew that on Mondays, participants would most likely be busy catching-up from the weekend.
   b. Nonetheless, to manage expectations, on Monday afternoon, we posted an announcement on LinkedIn informing participants that the following day we would be sending them an invitation.
   c. We send the first invitation to participate on Tuesday at 11h30, because at that time, we knew that several participants would be finishing their morning tasks and may be willing to complete the survey during their lunch break.
   d. We sent the first reminder on Friday at 11h30, to encourage people to either finish the survey before or during the weekend.
   e. On Tuesday, a week after having sent the first invitation, we posted on LinkedIn a second notice, thanking those who had already participated and encouraging those who had not yet participated to do so.
   f. On Wednesday, 5 days after having sent the first reminder, we sent the second and final reminder, letting participants know that we have extended the deadline so that people could complete it over the weekend.
   g. On Friday, the last weekend to complete the survey, we posted a third and final notice on LinkedIn.
   h. We kept the survey open for two weeks, including 2 weekends.

4. Be prepared to identify and respond to unanticipated errors.
   a. Several e-mails (about 20) bounced back. We immediately corrected those that had been entered incorrectly and updated those that had changed where we knew the updated information.
   b. We also discovered a mistake in our database where about 15 e-mails were associated with the incorrect name and corresponding set of courses. We also were able to correct that immediately.
2.4.6 Meta Guidelines

Because It-vest had developed a strong network of alumni, this enabled us to get more than a 20% rate of return on a survey that otherwise would have been dismissed as too long (our survey was estimated to take about 20 minutes to complete, whereas most people only participate in surveys that take an estimated 10 minutes or less to complete).

To develop stronger relations with and amongst alumni, It-vest has established a LinkedIn group for alumni and It-vest and the participating universities regularly invites alumni to executive events presenting frontline research.

2.5 Guidelines development

2.5.1 Methodology

The European Guidelines for new curricula fostering e-leadership skills comprise both a blueprint for curriculum development and key components of a quality assurance system for curricula in the field.

The ambitious target of setting up such blue-prints for curriculum development and defining quality labels was reached using a methodology based on an iterative development process, with strong starting points. At the core are individual new curricula for e-leadership skills development to become part of the ongoing educational offer of one or more business schools, universities or other educational institutions. Development and refinement started from literature on curriculum design and with lessons from the EuroCIO Executive Education programme, both in terms of content and curriculum development processes. The consortium business schools brought in their existing modular IT and executive/business course offers.

In this dynamic field, curricula have to be regularly reviewed against changing demand for e-leadership skills. The approach taken is to ensure alignment by providing means for feedback from HR and sources expert on demand.

Though influence from the demand-side, e.g. the 600 members of EuroCIO, is critically important and lacking in many offers today, the interests of the supply-side stakeholders are also taken into account. The autonomous business interests, and the existing quality assurance and policies of business schools, universities and other education and training providers will determine in what form and where demand is met by new curricula actually adopted and taught.

2.5.2 A concise view of the skill set

The focus of curricula is fostering e-leadership skills, which include in particular the capabilities needed:

- to exploit opportunities provided by ICT;
- to ensure more efficient and effective performance of different types of organisation;
- to identify, explore and take advantage of possibilities for new ways of conducting business/administrative and organisational processes; and/or
- to establish new businesses.

It is clear that e-Leadership skills require dedicated curricula; the required material is not contained even in advanced academic courses on information science; e-leaders require
significant understanding of entrepreneurship and business management, including and beyond the conventional role of a CIO.

The description of e-leadership centres on innovation capability. The idea of innovation comprises not only product innovation - successfully bringing new products to market - but also includes the introduction of new service provision, production processes with significant advantages over previous processes, and improvements in marketing processes and organisational roles. Thus the above description can be recast concisely as that e-leadership skills comprise a body of knowledge and set of competences which individuals need to initiate and guide innovation utilising ICT.

Individuals gaining e-leadership skills may or may not already have leadership responsibilities. Such responsibilities for guiding innovation may be given when heading a start-up or by assignment and promotion in hierarchically coordinated organisations - at any level, from project leader to CIO/CEO. Even outside a role with defined responsibilities for innovation, the individual concerned may be able, with the right skills, to identify and begin to exploit opportunities for innovative change in process or product, including setting out to create new business. It can be seen that the target group for e-leadership skills are those individuals with leadership opportunities, whether or not they already have or are likely to be given leadership responsibilities.

2.5.3 Profiles of ICT Professionals

The guidelines for new curricula make key use of the output of CWA 16458 on ICT Professional Profiles by incorporating the roles in the definition of curriculum profiles.

The primary objective of the CWA was to continue to support convergence in the European ICT skills landscape by developing and providing a set of ICT role profile descriptions based on the e-CF. The project produced its final deliverable in March 2012, containing a set of 23 European ICT professional profiles.

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The role profiles are not curricula profiles for defining learning outcomes of educational programmes. Instead the CWA provides the foundation for building individual position descriptions and for establishing career paths. In the conceptual scheme used by the CWA, one position may correspond to all of one or many jobs, or part of these, depending on the size of the organisation. A career path is seen as a sequence of jobs which represent professional self-development.

2.5.4 Prior best practice

The guidelines and quality label as defined build strongly on a successful cooperation between industry and academia initiated by the EuroCIO organisation.

Over some time, members of the EuroCIO association reached the opinion that the supply of educational offers at the right level for key corporate information management functions was not meeting the needs of modern enterprises, being patchy and of varying quality, and that their association should take steps to remedy this situation. The EuroCIO Human Resources Workgroup was set up in 2009 to define a set of appropriate courses, now known as the EuroCIO Executive Education programme. This group was to develop a plan, as envisioned by CIOs and their HR colleagues, to educate a wide range of people from business and IT to fill vacancies at higher managerial and executive levels.
Figure 20 shows the structure of the resulting programme. All levels are logically linked to each other, using the same terminology, definitions, business or IT approach and are compliant with CEN e-CF and CEN job-profiles.

Layer 1 aims at the education of the top level in the pyramid of IT functions in organisations. The EuroCIO Executive MBA programme on Corporate Information Management (Business & IT), aims at high-potential individuals, aiming at C-level positions in larger organisations or the equivalent outside, expected to manage departments, engage in digital transformation and business innovation projects.

Layer 2 comprises a number of EuroCIO Professional Programmes in Corporate Information Management (CIM) disciplines, aiming at the highest professionals, e.g. those reporting directly to a CIO, to enterprise architects, program and project managers, and leaders in the IT security and risk domains, or managers responsible for demand- or sourcing. The education is modular, with all content targeted at the highest level in the ICT organisation and a structure based upon a matrix of competences, the "e-Competence Matrix", defined by EuroCIO for this purpose, comprising the seven disciplines most critical to leaders in ICT user organisations.

Layer 3 comprises the individual modules of layer 2 courses, aiming at younger professionals and skills update requirements.

Offers have been developed and taught at layers one and two. The layer one "Executive MBA in Business & IT" is a modular course covering 9 domains:

- Strategy and Organisation
- Ownership of Enterprise and Governance
- Demand and Supply Management
- Leadership and Co-operation
- Business Processes and Technology
- Change Management and Human Capital
• Risk and Finance
• Marketing
• Law, and
• Business ethics.

Seven of the nine modules have a work-load spread over six months, each with three class sessions held on two consecutive days, and separated by 4-6 weeks of self-study - reading, discussion and writing and concluded with the Master thesis. The link between business and IT (systems, management, projects) is given attention in all areas, enriched by real case studies provided by CIOs.

The programme is intentionally international - business schools in any country can teach modules and students can attend modules across different countries, giving at least a European flavour to the education. Students receive a certificate for each completed module; the MBA certificate is awarded for all modules and an accepted thesis.

The CIO community has accepted an active role in the further development of the programme, in particular the responsibility to encourage provision by academia of educational offerings according to their needs. This is reflected in the current governance structure.

A Program Review Board (PRB), chaired by a CIO, with a membership of CIOs and HR managers, meets with professors teaching the programme to maintain content and ensure it remains demand-driven. The Executive MBA in Business & IT is currently offered in several countries.

2.5.5 Capitalising on curriculum guidelines and development techniques

The INSEAD Guidelines

The approach to guidelines developed in the e-leadership initiative builds on the conclusions of the recent INSEAD study "European e-Competence Curricula Development Guidelines". INSEAD's report to the European Commission on development guidelines for European e-competence curricula was written in 2010 in response to a Call for Proposals issued by the then DG Enterprise. The INSEAD report is not specifically focussed on e-Leadership skills. However, many of the lessons from that study are applicable to the brief of the new initiative, so that guidelines have been fully taken into account in the methodological approach.

INSEAD found that industry and business have often taken the lead in successful efforts to build better curricula for e-competences. In their investigation of industry-led efforts, INSEAD provides examples of ICT vendors having developed successful courses and certification processes offered by academic institutions, including the Microsoft Academy and SAP University Alliance. INSEAD also point to IBM’s efforts at developing Services Science as best practice in this field. The authors point out that university-led efforts at developing e-competence curricula have also tended to involve industry and government entities, listing as notable examples Aalto University (SF), CEFRIEL/ Politecnico di Milano, the UK’s Foundation

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Degrees, The It-vest initiative of Aarhus School of Business with other Danish universities, and the Petroleum Learning Centre at Tomsk Polytechnic University.

The report by INSEAD identifies a number of factors affecting the success of e-competence building across the full e-skills domain:

- e-competences must go beyond ICT skills
- life-long learning should be embraced and rewarded – key skills often needed for those already employed and experienced (enterprise architecture, strategy and innovation)
- academia, business and public sectors should engage regularly, focusing on complementarities rather than differences,
- curricula should be stable, yet flexible, and should be vendor neutral.

The report also proposes a number of guidelines for successful curriculum development, as summarised in the table:

| (1) | create appetite for potential students; |
| (2) | create relevance for industry and potential employers; |
| (3) | design modular curricula, easy to combine and foster a multi-disciplinary approach; |
| (4) | anticipate graduates' need to keep knowledge up-to-date; |
| (5) | monitor and constantly improve curriculum design and delivery process |

The curriculum profiles developed fully conform to these guidelines, and attention has been paid to the recommended role of key stakeholder groups. INSEAD describe the role academia, industry and governments are to play in putting recommendations into action:

- Academia is to work in close cooperation with business to guarantee the relevance and durability of the approach taken to re-shape their curricula, and link them to a subsequent life-long learning effort.
- Industry is to strengthen the component ‘personal development’ in staff career plans, including by making life-long learning an incentive and a basis for performance rating.

These actors should work with government to ensure the right equipment, teacher and educators’ education are available.

Universities and governments can also contribute to improving curricula by enhancing their use of new communications tools, showing “they practice what they preach”.

European institutions are to contribute by continuing to raise awareness about e-competence issues, and by encouraging and guiding national governments to further align their policies and actions with the objectives of building “the right curricula for the right competences”.

The new European Guidelines and Quality Label, centring on the Curriculum Profile, starts from the INSEAD idea of guidelines - written advice - to active advice, a usable portfolio of new curricula, embedded in a sustainable agile quality assurance framework ensuring optimal, ongoing match between course content and innovation and leadership requirements across economic sectors and organisation sizes.

In developing the new guidelines, INSEAD guideline 1 is fully supported. Curricula in the GUIDE portfolio are not job-specific but linked to competences which are in demand, capable
of cumulative extension to support career moves, as well as being fully focussed on innovation as the foundation for competitiveness. In fact, the definition of e-leadership skills given above can be further abbreviated to read “the skill to innovate using ICT” (innovate = create new enterprise, new process, new product etc.).

INSEAD Guideline 2 is also fully supported. Not only will industry of all sectors and size of organisation be engaged in the design and delivery of the new curricula for e-leadership skills development, primarily via advanced practitioners such as CIOs, but these groups will be engaged in the continual improvement of course offers and its adjustment to shifts in demand.

Furthermore, curricula conformant to the European Curriculum Guidelines will in principle all be composed of sets of modules, for exactly the reasons given by INSEAD, making it fully compliant with INSEAD Guideline 3, with the additional reason of compliance with market demand (and the 2012 Recommendation) for short-term, employment-based, add-on courses which will ideally on varying time-scales be able to be accumulated to EQF certified levels.

This latter attribute allows INSEAD Guideline 4 to be met, that graduates can keep their knowledge up-to-date throughout their professional lives, by taking advantage of modular offers with cumulative recognition.

The approach builds feedback and continuous improvement into the European Curriculum Guidelines, replacing the recommended “monitoring” of curriculum delivery. Consistency across education and training institutes offering conformant modules will be ensured where links to EQF and hence to the Bologna process are established.

Finally, curriculum delivery is to make optimal use of the most advanced and relevant IT-based delivery tools, for quality, maximisation of reach for acceptable cost. Course delivery is open to deployment of online techniques, which will also be used to enable feedback from the demand side - graduate practitioners and employers - to continuously update programmes.

Toohey’s analysis of curriculum design

The approach to guidelines for new curricula and their quality assurance set out from significant body of research into the design of curricula for higher education. In 1999 Toohey brought together multiple strands of relevant research, identifying different philosophical approaches (discipline-based, systems-based, cognitive, personal relevance and socially critical), teaching modalities and assessment methods across all disciplines in higher education and presenting curriculum design as a two-phase, project-like process, most often initiated within a teaching institution by academics or educational specialists15.

The Norberg framework

An approach specifically aligned to business curricula has been presented by Norberg (Designing business curricula: building relevance into higher education. In: International Journal of Management Education 7(1) 81 2008). Norberg’s approach was found to have particularly useful characteristics for the setting up of the proposed guidelines for new

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curricula to develop e-leadership skills, presenting an iterative process model for curriculum design, specifically for business subjects.

Norberg's approach has three principal phases:

- strategic
- operational / tactical, and
- post-launch (evaluation / extension).

Norberg to sees the knowledge to be imparted as determined by business - "specific set of commercial and professional imperatives of outside constituencies"; this is modified in the approach adopted to include checks on coherence, academic standards and stability, providing responsiveness to changes in skills demand structure without slavishly following all whims of enterprise management as to what knowledge they believe they can make best use of. The purpose of the process is to ensure not only that the course is attractive to students and employers, but to ensure motivation of teaching staff and making the risk of the business school or university in investing in a new course manageable.

Starting in an existing business school context, several modules will typically already be taught which cover at least part of the ground of a new curriculum. Therefore, new curricula are pragmatically not built from scratch but consist at least in part in adaptations of existing material, using existing teaching competence.

As Norberg notes, the use of existing modules and other course components as a means of lowering the costs of course development and therefore the institution's risk in approaching new markets. However, the use of standard components brings with it the risk of loss of coherence of the course overall. This can be countered by explicit monitoring of coherence both by expert appraisal and through feedback from students reporting breaks in coherence between modules.

The approach taken incorporates mechanisms to use information from outside the teaching institution, in particular information from employers about changes in their requirements and the fit of course graduates to the demands of the business environment they are to work in, and from graduates on their satisfaction with teaching, the usefulness of the knowledge gained.

The feedback mechanisms provide the necessary dynamic qualities, providing for the necessary adaptation to successes and failures, and to changes in the environment in respect of demand for particular elements of knowledge,

Curricula taught in an institution may not be developed in that institution, however, must usually be adapted to a teaching institution if coming from outside. There must be adaptive mechanisms in place to ensure a curriculum stays relevant.

2.5.6 The ecosystem framework

As reference for the development work, a vision of the curriculum development environment or ecosystem was developed. This was based on the positions and activities of key actors in the marketplace for e-leadership skills development, and the subsequent ideas on quality system incorporating demand-to-supply feedback channels (Figure 21). The guidelines are seen as a key component of an ecosystem in which e-leadership skills are fostered, with educational programmes delivered (supply) providing qualified leaders to meet industry demand. The ecosystem as a whole has enormous potential impact on the rate of innovation.
across the European economy and thus is of great importance to European policy on competitiveness and growth (Figure 22).

Figure 21 – An e-Leadership Skills Development Ecosystem...

Figure 22: ...contributing to European Competitiveness and Growth
2.5.7 Defining the quality label

Design of the Quality Label for e-leadership programme delivery set out from the results of the eSkills QUALITY project, which provided a quality label for industry-based training and certification (IBTC). This comprises a three level governance system: a board of European stakeholders set up to accredit a set of quality assurance organisations (also known as accreditation agencies or in eSkills QUALITY as management bodies) who assess new curricula and the business schools offering them to award (or rescind) European Quality Labels.

Industry-based certification and training (IBTC) offers were brought under a quality assurance regime and quality labels defined by the service contract "Quality Labels for Training Fostering E-Skills for Competitiveness and Innovation" carried out by empirica GmbH, Bonn in cooperation with EXIN, Utrecht and a group of experts in IBTC.

Setting out with a clear notion of quality - "The quality of a product is its ability to satisfy the needs and expectations of the customers" (Bergman and Klefsjö, 1994) - the eSkills QUALITY project set out to elaborate criteria set by the European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET) and apply them in the IBTC domain. This was followed by extensive expert discussions, in-depth interviews and extended stakeholder consultations, providing over 150 responses on the importance of a range of quality criteria and process alternatives.

The resulting criterion structure distinguishes the application of quality certification at institutional and programme level. The criteria applied in each case refer to the set of criteria generated as above, validated by stakeholders and referenced to EQAVET.

Figure 23 – Quality convergence model
2.5.8 Ensuring currency of content

Aligning curriculum supply with demand

Given the rapid rate of change and innovation in modern economies, a central quality issue is how educational courses and the curricula they are based on can be adapted to changing needs in the economy in a dynamic way. From this perspective, the guidelines can be used to define essential quality assurance processes designed to ensure that new curricula for e-leadership skills development meet market demand optimally.

Curriculum developers, academics in universities and business schools, are to be assisted in taking on board the changing competence requirements placed on IT professionals with leadership opportunities across the sectors of the European economy. For this the two areas, academia and practice, must interact, captured as "feedback" in this model.

A key component of the e-Skills Quality System is to ensure new curricula are aligned with demand, using feedback from students and employers on both the overall quality and usefulness of individual units of new curricula (curriculum-summative/demand feedback), and on opportunities to realign, modify content or otherwise improve a unit of a curriculum (curriculum-formative feedback).

Information flow from the demand side, from students and from employers, is proposed to be an integral part of the approach. Representatives of all areas of the economy - large, medium and small enterprises in IT and non-IT business, and employees - should be encouraged to participate to ensure that the needs of their segment are met.

Feedback from employers

Mechanisms for feedback can either be "asynchronous" - sending messages or filling in forms to provide feedback - or "synchronous", involving direct interaction, meetings and dialogue.

Making best use of social media techniques feedback today enables feedback channels to be transparent and live, always up-to-date.

Part of the asynchronous feedback process during design and at regular intervals might be a critical review of content by established leaders with the relevant knowledge profiles, e.g. CIOs of major non-supplier and supplier companies and successful SME entrepreneurs who are also ICT practitioners i.e. have strong IT qualifications.

Information to be solicited from employers might include:

- Current demand level: average annual number of employee hours on courses, broken down by type of course
- Demand structure / supply structure deficits: prioritisation of domains of the e-CF
- Sensitivity / responsiveness to supply structure improvements: proportional increase in demand (hours/year) for full alignment of supply to demand structure at constant prices

Employers wishing a richer interface to skills development suppliers and having an adequate demand profile can be admitted to specialist forums where curricular developments are being discussed between business schools.
Feedback from students

Eliciting summative feedback from freshly-qualified students has long been state of the art in higher education provision. Feedback from alumni later is less common though sometimes practised, as is information about course quality and demand from employers. Such activities have to date generally followed the paper questionnaire model as one-off, timed requests for a response, whether or not this has now been transferred to online media.

Such feedback is seen as an important attribute of quality for students, and essentially in support of supply-side business plans, so that demand side feedback has been included in scenarios of the Guidelines and Quality Label from the outset.

Involving students in the design of new curriculum is also acknowledged to be valuable, provided care is taken not to allow only the best and most vocal students to respond16

Qualification transferability is expected to be valued highly by students. The project will note that a centrally developed and managed reference portfolio for new curricula can be the basis for transferable modular qualifications. Such transferability might be included in accreditation and quality label award criteria, and the basis for this may already be laid in the intention to map to a coherent competences framework - the e-CF. Extensions in business skills are expected to be necessary before a complete and coherent body of knowledge and skills is available for the new field of e-leadership skills.

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16 see Diamond, R.M. Designing and Improving Courses and Curricula in Higher Education. San Francisco: Jossey-Bass 1989
3 Disseminating results from the e-Leadership Initiative

3.1 Local initiative triggered across Europe

The European Commission initiative developed in 2014 with a series of demonstration activities open to education institutions, industry partners and associations promoting e-leadership skill requirements in the workplace. The events across Europe have generated great interest and mobilised growing strength of activity among all stakeholder groups.

Dissemination of the European Guidelines and Quality Label was engaged in from the beginning of 2014. Activities centred on a series of regional cluster events across Europe, engaging over 1200 experts, stakeholders and policy-makers, and a high-level conference in Brussels, which attracted some 300 participants from across the EU.

The new ideas were taken out across Europe in 10 regional cluster events.

*Figure 24 – Regional cluster events across Europe*

![Map of regional cluster events](image)

e-Leadership regional cluster events mobilised over 1000 participants from industry and academia, and experts from nearly all EU countries.

A local host championed each event, and engaged each region’s top education providers and the key industry players.
Local hosts engaged excellent chairpersons and the events were professionally organised at some top locations.

The team presented the guidelines and their rationale. Speakers from industry gave their point of view.

The leading European associations explained their expectations and engagement with the e-Leadership Initiative. Top academics in the field explained their participation and related activities.
Top academics in the field explained their participation and related activities

Local and regional politicians used the events to explain their policy on skills for innovation

Participants came from across the regions and adjoining Member States.

The event summary shows how the speakers were rated very highly

**Regional Cluster Events – Facts and Figures**

- 10 regional cluster events in Sofia (BG), Henley (UK), Munich (DE), Milan (IT), Madrid (ES), Antwerp (BE), Budapest (HU), Aarhus (DK), Paris (FR), Wroclaw (PL)
- Covering EU Member States
- Organised with renowned local hosts
- Attended by ~ 1200 experts
- Highly positive feedback: average feedback: 4.4 on 5.0 scale (88% very positive)
Statements from local experts and stakeholders:

- In Budapest a local expert recognised an existential threat to business if the supply of e-leaders remains so low.
- In Milan one expert emphasised the need for ongoing dialogue between industry, universities, and business schools.
- Danish academics and industry representatives emphasised the need for a range of different types of e-leaders—horses for courses.
- An enterprise architect from the top of European insurance had a nice metaphor: e-leaders have to be comfortable travelling up and down between basement IT and high-flying strategy in the board-room.

A more detailed summary of these activities is presented in the following sections.

3.2 The e-Skills Conference 2014

The two day conference on e-Leadership and ICT Professionalism showed how two European Commission initiatives are fostering talent and excellence in Europe, how the e-Skills gap should be tackled and the essential elements in the development and promotion of e-leadership and ICT professionalism.

The conference took place in Brussels on 3rd December, 2014.
Stakeholders across Europe attending the conference agreed that action is required to counteract the effect of e-skills shortages, gaps and mismatches and a digital divide that affects economic growth, competitiveness, innovation, productivity and the employability of the workforce in Europe. These were the topics of a high-level European Commission e-Skills 2014 conference in Brussels promoting e-leadership skill development and ICT professionalism by addressing two significant elements: firstly, the growing demand for leadership in ICT innovation - or e-leadership - recognised by industry and shown in recent research results, and secondly the creation of an European Foundational ICT Body of Knowledge, to serve as a “go-to-reference” for fundamental knowledge and to facilitate communication and understanding between ICT professionals in Europe.

Rainer Strack, Senior Partner and Managing Director at Boston Consulting Group in Düsseldorf kicked off the event with a keynote address, focussing on future workforce gaps: “It sounds counterintuitive, but by 2030, many of the world's largest economies will have more jobs than adult citizens to do those jobs. Europe and the world will run into a major talent shortage very quickly, which especially holds true for higher skilled and e-leadership type of jobs”.

The Commission has not been slow to respond: “Urgent policy action and stakeholder initiatives are required which the European Commission has initiated through several initiatives” says European Commission Commissioner Elżbieta Bieńkowska. “These initiatives have already resulted in tangible results and good progress has been made on implementing actions for closing the gap between e-leadership skills demand by industry and supply of suitable education programmes by European universities and business schools, which the Commission is proud of and, which have been demonstrated at the event together with a pan-European Foundational ICT Body of Knowledge, ready for widespread adoption”.

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The conference heard that the ability of European enterprises to compete and evolve at the beginning of the 21st century is increasingly dependent on the innovative and effective use of new information and communication technologies (ICT). Europe needs to continuously focus on ensuring the right conditions for innovation and growth, and for digital jobs. Speakers agreed that it was crucial that all countries ensure that the knowledge, skills and competences of the European workforce, and in particular ICT professionals, meet the highest standards to remain competitive.

On the question of demand for e-leadership, the conference was told that Europe is unlikely to see 820,000 job vacancies advertised. It is known that employers experiencing persistent supply bottlenecks do not create the jobs they would like to, and therefore do not try to hire people that are not there. This figure is better understood as an absorption potential that could easily be fulfilled if the supply was there. Faced with shortages, employers instead
change their production structure or reduce output. The outcome is an increase in off-shoring, upward wage pressure, and unexploited production potential.

A number of speakers agreed that for effective e-leadership, people need very strong ICT skills and must lead qualified staff from ICT and other disciplines towards identifying and designing business models and exploiting key innovation opportunities. Their success is defined as making best use of developments in ICT and delivering value to their organizations. The Commission initiative was presented, which focuses first on the leadership needs of medium and large size enterprise at the top levels of decision-making.

In respect of e-leadership, Tobias Hüsing, Senior Research Consultant at empirica put the question to delegates: “Will the European higher and executive education system be capable of supporting 40,000+ seasoned ICT practitioners and managers to be turned into new e-leaders each year?”

Speakers reported how against this background the European Commission e-Leadership initiative aims to support the development of e-leadership skills through the strong practical instrument of a curriculum profile and the development of quality criteria that evaluate the programmes provided by higher educational institutions matched to curriculum profiles and demonstrate these at different business schools and universities in Europe. This should lead to encouraging the development of attractive, adapted, up-to-date educational offers able to increase the supply to the economy of experienced and highly qualified leaders in ICT-based innovation.

Closing this skills gap requires an ecosystem perspective, connecting the demand and supply side stakeholders of e-leadership skills. Responding to the inadequacies in the skills market flagged by stakeholders across the EU, the European Commission has launched the "e-skills strategy" and the "Grand Coalition for Digital Jobs". After responding to requirements for increased professionalism among ICT practitioners, and developing strategies and instruments to bridge the gap between e-skills demand and supply at that level, the new focus is on the skills gap in the e-leadership domain.

“To close this skills gap, we have applied an ecosystem perspective and identified techniques to improve information flows between demand and supply side stakeholders in e-leadership skills. The improved transparency and timely flow of knowledge about developing skills
requirements will enable institutions of higher and executive education to respond. A key practical instrument in communicating skills requirements are the new e-leadership curriculum profiles, which specify core skills, learning outcomes, understanding and competences required by e-leaders today, whether they lead innovation teams bringing specialist understanding of topics such as enterprise architecture or take full responsibility for enterprise innovation at C level” says Simon Robinson, director of empirica and coordinator of this action. A key element of these curriculum profiles and the guidelines is the requirement for mapping existing programmes onto the skills and competences of the e-Compeotence Framework (http://www.ecompetences.eu).

It was reported how e-leadership curriculum profiles and guidelines use and applicability has been demonstrated by the universities and business schools directly participating in this initiative in several European countries. Response by the education community is picking up with already more than 20 universities and business schools having evaluated their programmes against the new e-leadership profiles. Further dissemination and substantial stakeholder engagement was achieved through 10 regional cluster events throughout Europe reaching out to more than 1200 stakeholders and experts. The initiative continues to be open to education institutions, industry and associations understanding e-leadership skill requirements in the workplace.

Following the above policy actions and previous studies conducted, the Commission has initiated further action to contribute to the establishment of a framework for ICT professionalism. One of the essential elements to further develop ICT Professionalism is the development of a pan-European Foundational ICT Body of Knowledge. This Body of Knowledge is to create a “go to – ICT reference” to improve the quality of the ICT profession, to close the resource gap and to enhance growth in digital jobs in Europe. Having a universal way to refer to ICT knowledge is expected to facilitate communication amongst ICT practitioners and provide a baseline for competency models, certification programs, educational programs, and other workforce development initiatives, thereby reducing risks of failure in large ICT projects and strengthening ICT Professionalism.

Based on thorough research, best practice and international comparison, the conference was informed that the first version of the pan-European Foundational ICT Body of Knowledge has been drafted. Extensive stakeholder consultation was pivotal to achieve this. The European
Foundational ICT Body of Knowledge defines the base-level knowledge required of all ICT professionals and acts as the first point of reference for anyone interested in working in ICT. For instance for students and other individuals to orientate on possible future careers, and to plan for that. It will also be of use for anyone already working in ICT to orientate on a new career path, in specialisms close to the one he’s working in at the moment. It will provide for those organisations in the ICT profession a useful reference and document that helps to understand the entry level required for instance to create development paths (together with skills and competencies). The current version is considered an important first step that allows for follow up in years to come. As the ICT profession is continuously changing, a sustainable operating model ensures the Body of Knowledge is kept up to date and achieves widespread adoption.

Dinand Tinholt, Vice-president Capgemini Consulting: ‘The engagement from so many experts in Europe and beyond truly shows the importance of creating a Foundational ICT body of knowledge. We now have a firm and solid basis for further developments that will contribute to further maturing the ICT profession’

Promoting the pan-European Foundational ICT Body of Knowledge requires mobilisation and collaboration between various stakeholder communities at national and European level. Initiatives communicating and promoting its use are in place, in particular to show involvement of champions and leading practice to engage national level. This document was presented during the second day of the conference, next to the presentation of the pan-European foundational ICT Body of Knowledge, best practices that the Consortium has encountered during the research phase of the project shed light on their experience in fostering ICT Professionalism. Furthermore, international cooperation has been emphasised, and ideas for further intensification of this valuable collaboration explored. The conference has seen contributions from a wide range of representatives from government, industry, education, professional associations, standardisation bodies and certification bodies.

3.3 The e-Leadership Regional Cluster Events

3.3.1 An overview

Development of the curricula guidelines in 2013 was followed in 2014 with a series of demonstrations. Demonstration activities were open to education institutions, industry partners and associations promoting e-leadership skill requirements in the workplace.

Dissemination of the European Guidelines and Quality Label was engaged in from the beginning of 2014. Activities centred on a series of regional cluster events across Europe.
The new ideas were taken out across Europe in a series of events. These engaged over 1200 experts, policy-makers and stakeholders from industry and academia from nearly all EU countries.

The multi-region campaign was followed by a high-level conference in Brussels, which attracted some 300 participants from across the EU.

In pan-European dissemination, a local host championed each event, and engaged each region’s top education providers and the key industry players. The events across Europe have generated great interest and mobilised growing strength of activity among all stakeholder groups.

The regional cluster events took place in Sofia (Bulgaria), Henley (United Kingdom), Munich (Germany), Milan (Italy), Madrid (Spain), Antwerp (Belgium), Budapest (Hungary), Aarhus (Denmark), Paris (France), and Wroclaw (Poland). Feedback from participants was very positive, with ratings of contributions averaging 4.4 on a 5 point scale - 88% of "very positive" ratings.

Experts gave a number of interesting insights into the importance of e-leadership in their region or environment. In Budapest a local expert recognised an existential threat to business if the supply of e-leaders remains so low: “If organisations cannot transform their business models, they may not survive. e-Leaders are needed to make this transformation but they are hard to find.” (Regional Cluster Event Budapest, Zoltan Buzady). In Milan one
expert emphasised the need for ongoing dialogue between industry, universities and business schools, but Danish academics and industry representatives emphasised the need for a range of different types of e-leaders – horses for courses: "Different types of e-leaders are needed to best develop ICT-based services [...] The variety of application areas does not allow for a one-size-fits-all approach" (Regional Cluster Event Aarhus, Birgitte Hjelm Pavlsen). An enterprise architect from the top of European insurance had a nice metaphor: e-leaders have to be comfortable travelling up and down between basement IT and high-flying strategy in the board-room: “My vision of the e-leader is someone comfortable with regularly taking the elevator from board room to engine room and feeling at ease in both environments” said the industry expert at the Regional Cluster Event in Munich. Other comments were that “ICT is a key strategy item to leapfrog the CEE to a higher value region. These countries can turn challenges to advantages by utilising the good local talents via a professional management and (e-) leadership strategy.” (Regional Cluster Event Budapest, Prof. Mel Horwitch); “The establishment of a continuous dialogue between industry demanding e-leadership type individuals and universities and business schools expected to supply these to the market is needed” (Regional Cluster Event Milan, Lex Hendriks) and “The Curriculum Profile approach and self assessment allows universities and business schools to develop fully fledged e-leadership courses demanded by industry and in the market” (Regional Cluster Event Madrid: Prof. Eduardo Vendrell).

Local hosts engaged excellent chairpersons and the events were professionally organised at some top locations.

### 3.3.2 Events across Europe - highlights

#### Spain

The Spanish event was organised by IE Business School together with EuroCIO, CIONET and APMG and took place on 4th June 2014 at the IE Business School in Madrid ([http://eskills-guide.eu/events/spain/](http://eskills-guide.eu/events/spain/)), attracting 130 participants. It was opened by Lee Newman, Dean of Innovation and Behaviour at IE Business School, Dean of IE’s School of Social & Behavioural Sciences, and a professor of Behavioural Science and Leadership. He made it clear that “e-leadership is a matter of mindset”. It requires getting people into what he describes as a ‘growth mindset’ which demands a revised attitude towards change, away from trying to always see change as a danger and then trying to minimise it. For Newman, “technology and e-leadership go hand-in-hand”. Spanish industry leaders sent clear signals that there is a growing and critical lack of e-leaders in the economy, that is, individuals who are at the same time ICT savvy, business savvy and have the ability and skills to lead multi-disciplinary teams across functional and geographical boundaries.
Top-level executives from large Spanish corporations were present at the event (e.g. MAPFRE, Telefonica, Oracle) and strongly argued for an improved supply of e-leadership skills. In their view universities currently do not ‘produce’ the type of people with the skills required. Cristina Alvarez, CIO at Telefonica describes this requirement as ‘transversal’ skills needed as a prerequisite to become an IT savvy leader, i.e. “a person who knows how ICT works and how it can help”. Many of them have specific agreements with universities to provide them with skilled people, but they still do not receive sufficiently qualified individuals in sufficient numbers, said Jose Manuel Inchausti, General Manager of MAPFRE’s Business Support Area.

IE Business School and the University of Applied Sciences in Valencia are among the first in Europe to use the e-leadership curriculum development guidelines and apply the Curriculum Profile approach to their higher education courses. Silvia Leal, Academic Director, IE Business School, Madrid reported about the results of a mapping of their programme ‘El Programa en Dirección de la Innovación Digital y Gobierno TI’ to an e-leadership curriculum profile developed in the initiative. The mapping showed a high level of conformance already and gave very helpful hints on how to modify and further develop the programme to better align with the market needs. This has helped IE Business School to carry out the necessary modifications in time for a new launch of the programme in November 2014 which is then going to deliver a programme helping individuals to achieve the e-leadership skills in high demand in the market. Dr. Leal strongly recommends that other universities and business schools use the e-Leadership Curriculum Profile approach and carry out the mappings of existing courses and programmes in order to help satisfy the demand for these types of skills in industry and provide promising career opportunities to students.

An extended panel discussion revealed that e-leadership could become an interesting option for women to more strongly move into e-leadership as the area at the interface of ICT and business which would make it more acceptable for them as opposed to aiming at a career in pure ICT. It was argued that women often have skills complementary to men in this area which they can make best use of when aiming to become an e-leader.
When asked about the role and activities of the national government, Antonio Saravia, Deputy Director of Digital Economy at Red.es, Ministry of Industry, Energy and Tourism referred to the Digital Agenda for Spain (www.agendadigital.gob.es) which had been approved as the government’s strategy to develop the digital economy and society during 2013 – 2015. This strategy includes nine specific plans for implementation with concrete actions to help improve the development of university offers addressed to educating in the area ICT professionals and adjusting these to market needs and promoting collaboration between universities, industry and businesses.

There was unanimous agreement that e-leadership will be a key competence in the future economy and that the European Commission e-leadership initiative has been very timely and started at the right moment.

**Poland**

When welcoming the around 80 participants at the ‘e-leadership for the Digital Economy’ event organised by the European Commission and Wroclaw University of Technology, Zdzisław Szalbierz, Dean of the Faculty of Computer Science and Management referred to the opportunities offered by digital technologies and described his faculty’s programmes as those teaching at the interface of ICT and business and therefore already showing a propensity to e-leadership.

When speaking about the current technological trends and their implications on e-leadership skills, Marianne Kolding, Vice President at IDC Europe described the e-leadership skills as a mix of skills including those of re-imagining much of what we take for granted, strategic management/collaboration skills, hybrid market-ICT skills which include competences in customer-centred approach and issues, capability to develop new IT-based business opportunities and industry-specific skills, i.e. competences in specific industry business processes and of IT innovation implementation issues. The overview of required e-leadership skills by new technology trend is depicted in the overview above which she presented.

Presentations were made by a number of strong industry players in Poland, namely Capgemini Polska and VOLVO. Piotr Popawski, Director Capgemini Polska emphasised the need of ICT teams to have a good understanding of the business, the ability to also speak that ‘language’ and the requirement to be communicative to act as innovate, agile and often distributed SCRUM teams. The speech of Malgorzata Ryniak, from VOLVO IT Director emphasised the need of team and relationship building as important skills for acting as an e-leader. VOLVO has developed several tools like a leadership index or the TechWatch as enterprise-wide function to foster innovation. She made the point that e-leaders need to be
able to challenge change management on the business side as part of each IT solution implementation.

Two universities from Poland: Wroclaw University of Technology and Wroclaw University of Economics presented the results of their self-assessment of existing programmes and the mapping of these onto the e-leadership curriculum profiles. The presentation of Dr inż. Adam Dzidowski, Faculty of Computer Science and Management MSc in Business Information Systems illustrated the power of this approach. He emphasised as a strength that its use as a reference tool with clearly specified learning outcomes and skills and competences developed using the European e-Competence Framework, makes you aware of and knowledgeable about what to ask for when developing new and adapting existing courses and programmes towards e-leadership but also for the improvement in general. He saw a further strength of the assessment for using it to develop optional courses to be taught on a yearly basis to better close existing knowledge gaps among students. Finally, Prof. dr hab. inż. Mieczysław L. Owoc, Head of Business Informatics Major, Department of Artificial Intelligence Systems, Wrocław University of Economics presented the results of his mapping of one of his programmes also coming to positive conclusions on the usefulness of the e-leadership curriculum profile approach developed and advocated by the European Commission e-leadership initiative to improve the quality of e-leadership, covering organisation leadership in ICT innovation to deliver business value.

In the concluding panel discussion discussants from SMEs like Grzegorz Trubilowicz, CEO, Cooklet and Piotr Wieczorek, CEO, Fly on the cloud made the point that far too often academics graduating from universities do not provide the knowledge industry needs (especially for SMEs). They lack the ability to learn how to learn leading to the conclusion of the need to teach people to continuously learn including through experimentation thereby allowing failure but also the need to learn collaboration which requires the ability of trust. Further points made in the discussion included the following ones: need for leading by example, working towards a common vision, failure needs to be allowed, but people have to learn from mistakes.
Magdalena Tarasiewicz, Volvo Polska emphasised that at VOLVO there is a credit of trust for everybody right from the start and that putting them in a situation where they are responsible and thereby making people take responsibility enhances trust and eases them to become good leaders and eventually e-leaders. The combination of ICT savvyness and business savvyness would also be eased by moving managers across different departments.

The participants agreed to the need of conveying the message that there is a bright future in this area and an interesting career to choose especially for women who in the past have shown some reluctance to aim for a career in the ICT area. However, through e-leadership and the required combination of different skills very interesting opportunities also emerge for this target group.

Development of an appropriate ‘education ecosystem’ was seen as a key direction for closing the skills gap since interaction with like-minded individuals was seen as essential to keep up with the pace of change.

**Italy**

The Italian event in Milan attracted more than 120 registrations and was opened by Giampio Bracchi, President Fondazione Politecnico di Milano and full Professor of Information Systems at Politecnico di Milano followed by Donatella Sciuto, Vice Rector, Full Professor of Computer Architecture and Operating Systems at Politecnico di Milano. Both made a strong point for e-leadership and the need for universities and business schools to properly respond to the market demand with offers suitable to educate and train individuals to become e-leaders. At the same time they emphasised the long track record of their organisation in e-skills training and certification and the development and promotion of the European e-Competence Framework.

The event was organised by Fondazione Politecnico di Milano together with Rete Competenze per l’Economia Digitale, Cefriel, PoliHub and AICA and took place on 25th June 2014 at the Fondazione Politecnico di Milano in Milan ([http://eskills-guide.eu/events/italy/](http://eskills-guide.eu/events/italy/)).
Franco Patini, Coordinator e-Leadership Group - The Agency for Digital Italy, Member Rete Competenze per l’Economia Digitale presented the activities and future plans around the ‘Programma nazionale per la cultura, la formazione e le competenze digitali’ Linee Guida Indicazioni strategiche e operative’ which had just been launched in May 2014. This national strategy includes a whole chapter on e-leadership and as such it is unique throughout Europe. No other country in the European Union has yet developed a strategy document relating to e-leadership.

Giampio Bracchi, President Fondazione Politecnico di Milano and full Professor of Information Systems at Politecnico di Milano, Donatella Sciuto, Vice Rector, Full Professor of Computer Architecture and Operating Systems at Politecnico di Milano and André Richier, European Commission, at the opening of the event on ‘New Curricula for e-Leadership - Delivering Skills for an Innovative and Competitive Europe’ organised by Fondazione Politecnio di Milano together with Rete Competenze per l’Economia Digitale, Cefriel, PoliHub and AICA on 25th June 2014

Several top-level executives from large Italian industry and businesses were present at the event (e.g. Il Sole 24 Ore, Hewlett Packard, Assintel, Sematic, Fondazione Don Gnocchi) strongly argued for an improved supply of e-leadership skills. e-leaders are seen as individuals capable to achieve synergies across different IT applications and to lead multidisciplinary teams of people to innovate using ICT. In the view of Rino Cannizzaro, Amministratore Delegato Adfor, Consigliere Assintel “e-leaders are leaders in modern times”.

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Giuliano Pozza, Direttore Organizzazione e Sistemi Informativi (DOS), Fondazione Don Gnocchi emphasised the need for a “binocular view required by e-leaders” who have to be ICT savvy and business savvy and at the same time able to lead teams of individuals across functional and geographical boundaries.

“The establishment of a continuous dialogue between industry demanding e-leadership type individuals and universities and business schools expected to supply these to the market is needed” says Lex Hendriks, Business Knowledge Consultant at EXIN, Netherlands. This would help develop e-leadership higher and executive education programmes and help close the gap between demand and supply.

The European Commission e-leadership initiative has addressed this gap; dialogue is continuing and the curricula approach is intended to be implemented on an ongoing and continuous base.

Italian universities are among the first in Europe to use the e-leadership curriculum development guidelines and apply the Curriculum Profile approach to their higher education courses.

Marco Ferretti, Full Professor, Delegato CINI e GII, Dipartimento di Ingegneria Industriale e dell’Informazione, Università di Pavia reported about the results of a mapping of their master degree in Computer Engineering programme to an e-leadership curriculum profile developed in the initiative. It had helped them to identify area of improvement for the programme to become a true e-leadership one.

Angelo Carlo Morzenti, Full Professor in Information processing systems, and Head of Bachelor and Master Programmes in Computer Science and Engineering Politecnico di Milano – Dipartimento di Elettronica, Informazione e Bioingegneria also emphasised that “certain skills can only be obtained through a process of personal maturity and development” while Simone Martini, Università di Bologna, delegato GRIN per il Piano nazionale per la cultura, la formazione e le competenze digitali dell'AGID reported about the mapping of a bachelor Computer Science (Engineering) course onto an e-leadership curriculum profile which for obvious reasons did not show a high level of conformance with an e-leadership course profile. However, he expressed the view that it may be worthwhile to extend the approach and strategy and “… expand the very concept of e-leadership even to non technical education, especially at the bachelor level, where we cannot risk to insist on competences that will start to become old when the student will be on the job market”.

Franco Patini, Coordinator e-Leadership Group - The Agency for Digital Italy, Member Rete Competenze per l’Economia Digitale at the event on ‘New Curricula for e-Leadership - Delivering Skills for an Innovative and Competitive Europe’ organised by Fondazione Politecnico di Milano together with Rete Competenze per l’Economia Digitale, Cefriel, PoliHub and AICA on 25th June 2014

In her presentation Raffaella Cagliano, Full Professor School of Management Politecnico di Milano, Director Specialized Masters MIP Politecnico di Milano stated that the self
assessments approach is an interesting exercise for continuous improvement and development of programmes.

Filomena Ferrucci, Associate Professor in Computer Science, Università di Salerno emphasised the need for multi-disciplinarity in higher education to come up with e-leaders when showing the results of the mapping of their Laurea Magistrale in Tecnologie Informatiche e Management (MIT) course which will help the university to carry out the necessary modifications in time for a new launch of the programme.

The panel concluded that the e-Leadership Curriculum Profile approach looks like an interesting one to carry out the mappings of existing courses and programmes in order to further develop and adapt them in a way to help satisfy the demand for these types of skills in industry and provide promising career opportunities to students.

In the final panel discussion representatives from start-up firms discussed the topic of e-leadership. The four companies presented are positive examples of how the necessary combination of skills – either in one person or a team of individuals – is instrumental to starting and running a successful business.

**Hungary**

Chairperson of the event in Hungary, Zoltan Buzady, Associate Professor of Management and Organization and MBA Program Director of the CEU Business School underlined the importance of an education ecosystem with strong stakeholder interaction to widely spread e-leadership skills. Mel Horwitch, Dean of CEU Business School continued along the same lines when stating that we are being faced with a real challenge in our move to e-leadership which he described as the need for leading and changing teams and organisations in a not so transparent world with ICT increasingly playing a key role.

Participating representatives from industry, public administration and NGOs from Hungary but also neighbouring countries like Slovakia and guests from Macedonia sent clear signals that there is a growing and critical lack of e-leaders in the economy, that is, individuals who are at the same time ICT savvy, business savvy and have the ability and skills to lead multidisciplinary teams across functional and geographical boundaries. CEU Business School – supported by the guidelines for curriculum development, demonstrated how they are going to deliver these in the future to improve the quality of e-leadership, covering organisation leadership in ICT innovation to deliver business value.

The organisation was by the CEU Central European University Business School, IBM, EuroCIO, the Hungarian CIO association and IVSZ – the Hungarian IT industry association.

The event was opened by Zoltan Buzardy, CEU Business School. He made the clear point that if organisations cannot adapt/transform their business models, they may not survive and that e-Leaders are needed to make this transformation but that they are hard to find. It was against this background that the agenda for the day focused on developing e-Leaders. The question “Does IT matter” is no longer an issue. He emphasised that digital disruption is not about ICT, it is about whether you have good leadership and especially e-leadership. E-leaders require agility, i.e. the ability to create solutions incorporating latest IT developments quickly and in addition, they need to be able to orchestrate synergies between these multiple solutions / applications. Even CEOs need to be enabled to ask sensible IT-related questions which today very often does not seem to be the case.

Mel Horwitch, Dean of Central European University - Business School emphasised that ICT is a key strategy item to leap frog the CEE to a higher value region. These countries can turn...
challenges to advantages by utilizing the good local talents via a professional management and (e-)leadership strategy.

When speaking about the mission of EIT’s (European Institute of Innovation and Technology) ICT Labs Master School, Anders Floodström, EIT ICT Labs Education Director described the need for Europe to create more innovative people through the creation of knowledge and innovation communities. He expressed his wish for the European e-Leadership Initiative to establish close cooperation links with the EIT ICT Labs activities since both basically address similar issues around innovation, ICT and skills with different and important focal points: the e-Leadership initiative focussing on e-leadership skills and innovation and EIT ICT Labs on entrepreneurship and innovation. To him working aiming at and achieving synergies between these two European activities is seen as a must.

Edit Herczog, former Member of the European Parliament started her presentation with an elaboration on what she described as a new mega trend: scarcity and in particular scarcity of human talent. She presented statistical figures showing that Hungary is facing negative e-skills related developments and decreasing policy activities in this areas which is something to watch out and properly react upon politically.

Paul Costelloe, Director Executive Education at EuroCIO articulated the view of Europe’s CIOs and emphasised the importance of e-leadership skills and the activities which EuroCIO had started to compensate for the apparent lack of suitable higher and executive education offers in the market.

This presentation was followed by two speeches from Hungarian CIOs and CEOs on industry demand for e-leaders also seen in high demand by both, Ferenc Alföldi, CIO, Takarekbank and Viktor Lénárt, CEO, GROW. Ferenc Alföldi described the situation of the Hungarian banking sector which has grown ‘fat, no more agile, inflexible and in urgent need of losing weight’. In the past and up until now banks did not manage to acquire the right skills. He urges them to stop putting ‘lipstick on pigs’ and develop appropriate e-skills and e-leadership strategies.

All introductory speakers welcome the European Commission e-Leadership initiative which will help to improve Europe’s competitiveness. On support and developments in the e-leadership area they highly appreciated that Brussels had taken leadership here, to provide the necessary guidance and orientation and the initiation of first demonstrations of e-leadership higher and executive education programmes and courses.
Sharm Manwani, Professor at Henley Business School in the UK, reported about the results of a mapping of a European Business Enterprise Architecture Executive Programme to the corresponding e-leadership curriculum profile developed in the initiative. There was a close match but it helped the three business schools to identify areas of improvement to become an even stronger e-leadership programme. These – including a stronger focus on emerging technology trends - have been incorporated in the next teaching round starting with a new cohort of participants in October 2014. In conclusion, he recommended that all stakeholders review the existing e-leadership curriculum profiles as a starting point either for their education needs or in scoping their programmes.

Achilles Georgiu, Ass. Professor and Programme Director at CEU Business School reported using the Initiative curriculum profile to map his IT in Management programme. He found this a very useful tool was impressed about the assessment process and expressed support for its wider use but would also welcome improvements to ensure assessment judgements are not just easy to make but also unambiguous. They concluded that the e-Leadership Curriculum Profile approach looks like an interesting one to carry out the mappings of existing courses and programmes in order to further develop and adapt them in a way to help satisfy the demand for these types of skills in industry and provide promising career opportunities to students.

The event ended with a very lively expert panel discussion chaired by Achilles Georgiu and also involving the audience. Articulated by Pál Kerékfy and agreed on by the expert panel members large organizations will continue to work in a coordinated (there is a clear need for structure and hierarchy) way but the ‘conductor’ - as the e-leader was described - will have to listen to many people in the ‘orchestra’ which was the term used for the organisation. To some extent and for Zsolt Veres, IBM Country General Manager this could be described with operation of and the music made by a jazz band in which parts of the music are constructed but others come from improvisations reflecting the creativity potential of its actors and argument also used by Sharm Manwani demanding creativity pools (jazz bands) operating in structured organisations.

Referring to the notion of a T-shaped portfolio of skills needed by e-leaders (or as others described it as ‘dual thinkers’) and as presented in one of the speeches, the discussion went on to develop the notion of a pi-shaped portfolio of skills using the sixth letter from the Greek alphabet to best describe the skills needed by an e-leader. The three elements of this letter would probably even better describe the e-leadership skills required and what any e-Leadership programme needs to generate in terms of learning outcomes that demonstrate three dimensions – business, technology, personal.
The point was made by Achilles Georgiu that not only CIOs need to become e-leaders but that in SME the CEO has to take this role. Sharm Manwani added that even in large corporations and in cases where the CEO does not delegate business architecture development to the CIO, the CEO has to become the business architect.

Development of an appropriate ‘education ecosystem’ was seen as a key direction for closing the skills gap since interaction with like-minded individuals was seen as essential to keep up with the pace of change.

Germany

At the event in Munich, Germany, Dirk Pollert, Director of the Metalworking and Electrical industry in Bavaria (bayme) underlined that "Bavarian industry needs digitalisation for innovative advantage" - and pointed to the focus on e-Leadership to address this. German industry representatives sent clear signals that there is a growing and critical lack of e-leaders in the economy, that is, individuals who are at the same time ICT savvy, business savvy and have the ability and skills to lead multi-disciplinary teams across functional and geographical boundaries.

The European Commission event, to which 200 individuals registered was organised by bayme, VOICE – the national German CIO association and the Technical University Munich. It was opened by Dirk Pollert, Director of the Metalworking and Electrical industry in Bavaria (bayme). Pollert made the clear point that Bavarian industry aims to be among world-wide avantgarde if the current deficit in qualified personnel can be met followed by Prof. Helmut Krcmar who put the position of the European Commission, underlining the impact of demographic change in the world, and that the new demands of consumers across the globe puts new competitive pressure on Europe. The response must be to accelerate innovation! He made the strong point that the skills of e-leadership are essential for Bavarian industry to maintain their excellent global competitive position and the need for universities and business schools to properly respond to the market demand with offers suitable to educate and train individuals to become e-leaders.
Franz-Josef Pschierer, Secretary of State Economics Bavaria, at the opening of the event on ‘e-Leadership for Business Excellence Day 2014 - Delivering Skills for an Innovative and Competitive Europe’ organised by bayme, VOICE – the national German CIO association and the Technical University Munich on 17th July 2014 in Munich

Franz-Josef Pschierer, Secretary of State Economics Bavaria emphasised that one of the key topics of today is e-leadership. He stated that “we want to position Munich among the hot-spots of the international start-up scene”. With the programme “Digital Bavaria” the region will pave the way towards the continuation of economic success in Bavaria. He therefore welcomes the European Commission e-Leadership initiative which will help to improve Europe’s competitiveness. On standards and related support and developments in the e-leadership area he thought Brussels should take leadership here, to avoid 28 different solutions.

VOICE president Dr. Thomas Endres emphasised the key role of innovation in e-leadership. “The key area is to provide leadership for innovation in the challenging third segment of digital transformation - new ideas using new possibilities”. He pointed to the critical role of “top skills” (“Digitalisierungskompetenz”) in innovation and the importance of innovation in game-changing areas which have survived the hype peaks. A key statement made was that good innovation management requires the skill to identify and assess upcoming game changers. He pleaded for new methods for controlling applied to innovation. Instead of mechanical filling of complex Excel business case templates, the new paradigm is to use “acceptable loss” methods for decision-making under uncertainty.

An expert in insurance IT provided his vision of the e-leader as a person comfortable with regularly taking the elevator from board room to engine room and feeling at ease in both environments.
Gregor Hohpe, Chief Architect, Allianz, at the event on ‘e-Leadership for Business Excellence Day 2014 - Delivering Skills for an Innovative and Competitive Europe’ organised by bayme, VOICE – the national German CIO association and the Technical University Munich on 17th July 2014 in Munich

Helmut Krcmar, professor at Technical University Munich took up on the elevator example, pointing out the key fact that you don’t just go to the engine room once in your life and then escape out of it forever. Furthermore, the importance of play in getting to understand new technology options, that we learn many important things by playing, by self-motivated exploration and solution tinkering unstructured by targets, agreements or expectations on outcomes was emphasised as another important aspect. Another feature of e-leadership is experience and the fact that e-leaders can’t be hired directly from school but “need to be grown”. Finally, interaction is seen as essential to keep up with the pace of change. This requires e-leaders needing continuous interaction with a network of likewise people to keep up and to keep pace.

German and Swiss universities are among the first in Europe to use the e-leadership curriculum development guidelines and apply the Curriculum Profile approach to their higher education courses. Helmut Krcmar, Professor and Chair of Computer science in economics at Technical University Munich (TUM), reported about the results of a mapping of their Executive MBA in Business and IT to an e-leadership curriculum profile developed in the initiative. It had helped them to identify area of improvement for the programme to become a true e-leadership one. In his view a curriculum profile for e-leadership can “be a buying help for the corporate university shopper”, it can “create transparency and comparability”. Walter Brenner, Professor and Director of the Institute of Information Management at the University of St. Gallen in Switzerland reported using the Initiative curriculum profile to map two of their programmes. They found this a very useful tool, “we loved it!” Both Krcmar and Brenner but also Dr. Jochen Müller from the University of St. Gallen were enthusiastic about the assessment process and expressed support for its wider use but would also welcome improvements to ensure assessment judgements are not just easy to make but also unambiguous.
**France**

Pascal Buffard, Chairman of CIGREF and Chairman of AXA Technology Services demanded at the Paris event the creation of a ‘new entrepreneurial leadership’ whereby the development of the human capacity and skills become a critical issue. CIGREF has been working on the topic of competence frameworks and development already since 1991 contributed to the development of the e-Competence Framework and just published the 2014 edition of the ‘Nomenclature RH – Les métiers des systèmes d’information dans les grandes entreprises’. The chairperson Bruno Lanvin, Executive Director of INSEAD’s European Competitiveness Initiative opened the event at the UNESCO building in Paris speaking about the ‘Darwinian necessity’ to pick up the topic of digital transformation and e-leadership since e-leaders are to lead the digital transformation to ensure survival of the business. He invited decision makers in organisations to more ‘focus on developing visions of what ICT can do’ instead of focussing on product development and cost reduction only. He also called on CIOs to become true e-leaders by being ‘themselves the bridges’ they wanted to see between market demand and supply of ICT-based services.

In his video-address, French Digital Champion Gilles Babinet made the point that different ecosystems (industry as well as education institutions) need to work together to bridge the gap between e-skills demand and supply. Referring to his own work on the Global Talent Competitiveness Index (GTCI), INSEAD’s Bruno Lanvin reminded the audience that Europe is rather well positioned on the talent front, but has to urgently address its talent mismatches, both from a sectoral and from a geographical point of view, as divergences are growing between North and South.
André Richier from the European Commission drew a general picture of the coming years with respect to the new perspectives for the world economy. He stressed on the importance for Europe to foster greater productivity, growth, competitiveness, ICT-led innovation and digital jobs. The goal of the European Commission's initiative on e-Leadership which started in 2013 is to increase the talent pool of e-leaders for enterprises (CIOs, professionals, business leaders etc.). It has been followed in January 2014 by a complementary initiative on e-leadership targeting start-ups, gazelles, SMEs (entrepreneurs etc.). Both are closely linked to the promotion of digital entrepreneurship and the EU long-term e-skills strategy and the mobilisation of Member States and stakeholders (Grand Coalition for Digital Jobs) and awareness raising (e-Skills for Jobs 2014 campaign, http://eskills-week.ec.europa.eu/).

Jean-Pascal Gaudy of SAFRAN emphasised the importance of partnerships of industry with universities and business schools for developing and getting staff with the necessary skills for managing the digital transformation which he asked ‘to be seen as a journey and not a destination’. The speech of Yves Poilane, Director Telecom ParisTech and Chairman of Pasc@line emphasised the same topic by stating that ‘no business will escape from digital revolution’. Referring to Schumpeter’s ‘creative destruction’ he emphasised that ‘no company will live forever on acquired advantages’ and that he would see e-leadership also as entrepreneurship.

Finally Prof. Dr. Renaud Cornu Emieux, Directeur de l'Ecole de Management des Systèmes d'Information de Grenoble (EMSI Grenoble) – supported by the guidelines for curriculum development which have been developed as part of the European Commission e-leadership initiative (www.eskills-guide.eu) - demonstrated how they are going to deliver these through their higher education programme in the future to improve the quality of e-leadership, covering organisation leadership in ICT innovation to deliver business value.

A strong point was made by Bruno Brocheton, VP IS, Euro Disney and Vice President, CIGREF in the panel discussion when he asked for executive board members to also be trained in e-leadership ‘to get them out of their comfort zone and into the real world’. Daniel Dubreuil, Chief Information Officer, SAFRAN described the changes of his company over the past years with respect to its business model: instead of developing engines they now lease flight time as a service. He also emphasised that e-leaders need to be found at all levels not just CEO or CIO level and that these need to be created at universities and the need to inject in internal
training programmes exercises which help them to develop e-leadership skills at all levels. **Tristan Monroe**, Chairman of Metanex described his view of an e-leader as a person able to design and develop new uses of digital technology, experimenting with ideas and turning these into a business model.

When being asked the question whether MOOCs could be seen as the solution for training e-leadership skills more widely **Prof. Dr. Sharm Manwani**, from Henley Business School made the point that significant areas of skills development especially for this target group need to be interactive but that a core base of knowledge acquisition may be provided successfully via MOOCs.

Finally, **Prof. Dr. Renaud Cornu Emieux** even went so far to demand that e-leadership should be part of the curricula of all programmes in business and management schools.

In his conclusions the chairman, **Bruno Lanvin** highlighted the key issues and results of the day. Instead of recapturing all of them we only want to highlight a few in the present report. He made the point that awareness for e-leadership has arrived: policy makers have understood that it is a matter of collective responsibility between industry and the higher and executive education institutions. Training of an e-leadership culture has to take place at all levels, from primary school to life-long-learning. Partitions need to be removed to generate an innovation culture across all sectors and foster interdisciplinarity. Universities and business schools need to speed up their efforts to adapting existing curricula and developing new ones to best address the needs of industry and labour markets. Pasc@line is seen as a worthwhile initiative which has shown that we need to build on the enthusiasm of the ‘Y’ generation. The education ecosystem (involving industry as the demand side actors) is still in the process of crystallising, and could benefit from the emergence of different types of ‘brokers’ as shown in the European Commission e-Leadership initiative.

**Denmark**

**Nils Olaya Fonstad**, MIT Center for Information System Research (CISR) in the USA as chair opened the event in Aarhus referring to ‘digital disruption’ affecting European economies and societies dramatically. By stating that technology itself does not disrupt – it is the use and management of technology that is disrupting - he underlined the importance of an education ecosystem with strong stakeholder interaction to develop and widely spread the skills needed within the workforce to best cope with this and address it properly – which are now called e-leadership skills.

The conference was organised by the European Commission together with it-forum and it-Vest. Around 140 participants attended the regional cluster event.
It was opened by Nils Olaya Fonstad, MIT Center for information System Research (CISR). He referred to Nicholas Carr’s explosive Harvard Business Review article “IT Doesn’t Matter.” Does IT Matter? In his article published in 2003 the author explains how technological, economic, and competitive forces are combining to transform the role information technology plays in business, with profound implications for IT management and investment as well as strategy and organisation. In analogy to ‘does IT matter?’ the chairman asked the question ‘does e-leadership matter’ which he himself answered with ‘yes, it does’ pointing out that this needs to be orchestrated across innovations in ICT and business. He emphasised that digital disruption is not about ICT, it is about whether you have good leadership and especially e-leadership. E-leaders require agility, i.e. the ability to create solutions incorporating latest IT developments quickly and in addition, they need to be able to orchestrate synergies between these multiple solutions / applications. Even CEOs need to be enabled to ask sensible IT-related questions which today very often does not seem to be the case.

When speaking about the current technological trends and their implications on e-leadership skills, Marianne Kolding, Vice President at IDC Europe described the e-leadership skills as a mix of skills including those of re-imagining much of what we take for granted, strategic management/collaboration skills, hybrid market-ICT skills which include competences in customer-centred approach and issues, capability to develop new IT-based business opportunities and industry-specific skills, i.e. competences in specific industry business processes and of IT innovation implementation issues. The overview of required e-leadership skills by new technology trend is depicted in the overview above which she presented.

This presentation was followed by Jette Lundin of it-Vest who asked for the establishment of a continuous dialogue between industry demanding e-leadership type individuals and research groups at universities and business schools conducting research in the area of ICT management fighting for visibility and recognition and trying to supply e-leadership competences to the market. This dialogue is needed to get out of the ‘jungle’ of the so far mostly invisible higher and executive education programmes for teaching e-leadership skills. This would help develop more appropriate, visible and transparent e-leadership higher and executive education programmes and help close the gap between demand and supply. The European Commission e-leadership initiative has addressed this gap; dialogue is continuing
and the curricula approach which she presented is intended to be implemented on an ongoing and continuous base.

It-Vest had used the e-leadership curriculum development guidelines and successfully applied the Curriculum Profile approach to their Master in IT programme. There was a close match and it helped to identify areas of improvement to become an even stronger e-leadership programme. She recommended that all stakeholders review the existing e-leadership curriculum profiles as a starting point either for their education needs or in scoping their programmes. She found this a very useful tool impressed about the assessment process and expressed support for its wider use but would also welcome improvements to ensure assessment judgements are not just easy to make but also unambiguous. They concluded that the e-Leadership Curriculum Profile approach looks like an interesting one to carry out the mappings of existing courses and programmes in order to make the offers visible and transparent and further develop and adapt them in a way to help satisfy the demand for these types of skills in industry and provide promising opportunities to students.

Participants who had been students of the ‘Master in IT’ programme developed by it-vest and offered by three Danish universities emphasised its highly flexible nature which allowed them to pick and chose modules and courses to best suit their needs and interests.

In the panel and plenary discussion several points were made. Birgitte Hjelm Pavlsen, Senior Consultant at the Municipality of Odense expressed her view that different types of e-leaders are needed to best develop ICT-based services for the delivery of services in the public sector that were formerly delivered either face-to-face or physically. The variety of application areas does not allow for a one-size-fits-all approach. In her view top-level management, politicians, and management at all levels needs to be e-skilled in addition to having strategic management skills to lead digitalisation. Increasing the responsibility for digitalisaiton has to be with employees at all levels. This requires highly flexible education courses like the ‘Master in IT’ which she sees as a very promising approach.
Bo Sejer Frandsen, CEO, It-forum stated that Denmark and Europe need these e-leaders now. But he also raised the issue of geographical disparities of their appearance and especially the lack of e-leaders outside university cities and especially suitable higher and executive education programmes for those in SMEs and types of businesses in rural regions.

For Gitte Moldrup, Director of it-vest the starting point to become an e-leader is a very good understanding of the situation in specific areas. She took the example of the finance sector, where IT professionals need to be sitting next to traders to understand the business to then develop best suitable solutions. She made the point that there is the need to build the bridge from both sides, i.e. integrate business competences with IT and the other way round.

Andrea Carugati, Professor at Aarhus University referred to the earlier statement of Bo Sejer Frandsen when speaking about the results of his research and experiences and stating that the need for e-leaders in SMEs differs from the ones in large corporations. He gave different examples from agriculture and the health sector for illustrating this and ended with the provocative statement “e-leadership is not mandatory, neither is survival” to indicate the need and urgency of action to be taken.

**Bulgaria**

In the opening address Ms Anna-Marie Vilamovska, Secretary for Science and Healthcare Policy of the President, read a special message from Rosen Plevneliev, President of the Republic of Bulgaria, clearly stating that “it is an important challenge for Europe to create and prepare future e-leaders and to build sustainable digitized ecosystems”. She continued that “today our societies increasingly need new leaders with innovative and entrepreneurial way of thinking that is based on new technologies, ready to work in a more and more competitive and dynamic world”. The President encouraged the conference participants, including employers and their associations, universities and business schools, and government institutions supporting innovation, to take the opportunity offered through this European Commission event to discuss and to agree on concrete actions for sustainable development in the field of digital competences, e-leadership and entrepreneurship.

André Richier from the European Commission drew a general picture for the coming years with respect to the new perspectives for the world economy and demographics. In this
context, he stressed on the importance for Europe to foster greater productivity, growth, competitiveness, ICT-led innovation and digital jobs. Then he said that the goal of the European Commission’s initiative on e-Leadership which started in 2013 is to increase the talent pool of e-leaders for enterprises (CIOs, professionals, business leaders etc.). It was followed in January 2014 by a complementary initiative on e-leadership targeting start-ups, gazelles, SMEs (entrepreneurs etc.). Both are closely linked to the promotion of digital entrepreneurship and integrated within the EU long-term e-skills strategy and the efforts made to mobilise Member States and stakeholders (Grand Coalition for Digital Jobs) and raise awareness (e-Skills for Jobs 2014 campaign, http://eskills-week.ec.europa.eu/).

Consensus was achieved among delegates to the European Commission event in Sofia on the urgent need to improve the quality of skills in an area key for innovation and competitiveness: e-leadership. At the event, the ESI European Software Institute – Center Eastern Europe (ESI CEE) and the New Bulgarian University demonstrated their results.

The event was organised with the European Software Institute – Center Eastern Europe (ESI CEE) and the New Bulgarian University and took place on 20th May 2014 at the New Bulgarian University in Sofia (http://eskills-guide.eu/events/bulgaria/). It was the first of a series “The opening of the campaign in Bulgaria is a recognition of the leadership of our country and a sign of the maturity of the Bulgarian ICT industry,” said George Sharkov, director of ESI CEE. The event was opened by an e-leader “from the future” - ESIco NAO robot (https://www.youtube.com/watch?v=lpJEvYRwMr5) and attended by more than 100 participants from Bulgaria, Romania, Serbia, Greece and Cyprus, other neighbouring countries to Bulgaria and further European countries, USA and Africa.

On the panel discussion, industry representatives on the stage and in the audience sent a number of messages, achieving consensus on many. It was stated that industry demand for ICT professionals is at least 3 times higher than current output from universities and professional qualification programs, although there are more than 20 industry initiated “software academies” or training & qualification programs in place. All speakers stated that industry should be encouraged to engage more intensely with universities and executive education programs and that there is a lack of real incentives or help for the small...
businesses. Multinational / foreign ICT investments are tolerated (with real incentives, including tax reduction) while the real e-leadership “labs” – small business and start-ups - are in a disadvantaged position. e-Leadership was seen as an interesting concept and approach but a need was expressed for a clear, pragmatic message in language which is easy to understand to support the promotion of e-leadership.

The panellist George Brashnarov, Chairman - Bulgarian Association of Software Companies, made the point that coordination and leadership from the European Commission is important. Other panellist – Peter Statev, Chairman of the Bulgarian ICT Cluster, emphasized the Grand Coalition call for synergy between all stakeholders and expressed the local industry commitment and role in establishing the national coalition and action plan.

Representatives from higher education and the New Bulgarian University in particular made a number of relevant points, including that e-leaders start their education in general schooling, so that schools can contribute with appropriate teaching in maths and modern informatics from early years onwards. However, it was stated that ICT education in schools in Bulgaria has been reduced significantly and systematically due to a lack of qualified teachers and a seemingly lower demand by pupils. Industry strongly supported this protest and engaged with pilots and support as pointed out by George Sharkov, director of ESI European Software Institute. Education in these subjects requires properly trained teachers, and this in turn requires adequate incentives to train trainers. The industry demand for ICT professionals, trainers and e-leaders exceeds the capacity of the universities and the executive education programmes as stated by Valentina Ivanova, professor at New Bulgarian University. Software industry is engaged with the academia and doing pilots and providing occasional support. However, to make this involvement more systematic, elaborate long term cooperation mechanisms should be innovated and resourced. She argued that the European Commission should promote e-leadership and quality labels for new curricula fostering e-Leadership skills. Other local universities were invited to commit to higher and executive education programmes on e-leadership. The Sofia University, Technical University of Sofia, Varna Free University, University of Ruse and others were encouraged to assess their relevant programmes and develop a plan for programme improvement in line with the requirements documented in Curriculum Profiles developed by the European initiative.

The Bulgarian government representative Orlin Kuzov from the Ministry of Education and Science agreed that there is a lack of e-leaders throughout industry and there is a need for improved executive education on e-leadership. He reported that a continuous awareness campaign and dedicated PR campaigns are being planned to persuade people to take up these career opportunities. In response to a proposed by the audience one special Ministry for ICT, he found the idea interesting, but to be successful it requires stronger synergy and coordination of several ministries and agencies and a higher level ICT prioritization. Finally and in respect of ICT education in schools he reported that materials are out of date and that was the reason for recent withdrawal of curricular content. The content must be modernised before teaching resumes.
André Richier, European Commission at the event on ‘New Curricula for e-Leadership - Delivering Skills for an Innovative and Competitive Europe’ organised together with ESI European Software Institute – Center Eastern Europe and the New Bulgarian University on 20th May 2014

There was unanimous agreement that e-leadership will be a key competence in the future economy and that the European Commission e-leadership initiative has been very timely and started at the right moment in time (more information: www.eskills-guide.eu). This European initiative in which ESI CEE and the New Bulgarian University are involved, aims to develop and recommend specific curriculum profiles for e-leaders (based on the European e-Competence Framework), and to outline the knowledge and skills necessary for business leaders to turn into e-leaders. New Bulgarian University was among the first to use the associated guidelines and apply the Curriculum Profile approach to their higher education courses. In a follow-up after the event by ESI CEE, three universities engaged in piloting and implementing in their curricula updates the e-leadership profiles and aligned their courses with the European e-Competence Framework (e-CF) – Sofia University (Faculty of Math and Informatics), Varna Free University, American University in Bulgaria (AUBG). An interest to apply the profile alignment method in other IT-intensive areas and job profiles was expressed by the Bulgarian Industrial Association (engaged with national jobs classification and involved in ESCO - Classification of European Skills/Competences, qualifications and Occupations – currently under development).

The event was complemented by a show-case of five young digital entrepreneurs and leaders “in action” of the StartItSmart pre-accelerator presenting pitches of early start-ups. The enthusiastic response of the audience proved that this is the type of e-leaders Bulgaria and Europe would need more of.

The event was followed by the launch and publication of a Memorandum for the ‘Digital National Alliance (DNA) of Bulgaria which was signed and presented at an event on 10 June 2014 where Deputy Prime Minister of the Republic of Bulgaria Daniela Bobeva said that "on behalf of the Government of the Republic of Bulgaria [we] support the establishment of the Bulgarian branch of the Grand Coalition for Digital Jobs, not only because it is a useful initiative of the EU, not just because Bulgaria is among the first EU member states to establish this coalition, but because we need it". According to her, concerted efforts to create digital skills of adolescents and adults are only one of the objectives, and the results will be visible in electronization and increasing productivity. "No one today can deny that science, technology and innovation play a leading role in ensuring economic growth" she added.
Belgium

the event ‘New Curricula for e-Leadership - Delivering Skills for an innovative and competitive Europe’ the chairperson Professor Steven de Haes from Antwerp School of Management underlined the importance of the need for specific skills of decision makers in organisations for achieving higher levels of innovation and competitiveness which the event would be going to address using the term ‘e-Leadership’ skills to address this. Belgian and Dutch representatives from industry, public administration and NGOs sent clear signals that there is a growing and critical lack of e-leaders in the economy, that is, individuals who are at the same time ICT savvy, business savvy and have the ability and skills to lead multi-disciplinary teams across functional and geographical boundaries. Business schools from two countries (Antwerp School of Management and Tias in Tilburg) – supported by the guidelines for curriculum development which have been developed as part of the European Commission e-leadership initiative (www.eskills-guide.eu) - demonstrated how they are going to deliver these in the future to improve the quality of e-leadership, covering organisation leadership in ICT innovation to deliver business value.

The conference was organised by the European Commission together with Antwerp School of Management (being part of the University of Antwerp), the CIO Forum Belgian Business and EuroCIO – European CIO Association. The cluster event brought together around 100 leading participants in this field from Belgium and The Netherlands.
It was opened by **Professor Steven de Haes**, Antwerp School of Management. He made the clear point that if organisations cannot adapt/transform their business models, they may not survive and that e-Leaders are needed to make this transformation but that they are hard to find. It was against this background that the agenda for the day focused on developing e-Leaders. The question “Does IT matter” is no longer an issue. He emphasised that digital disruption is not about IT, it is about whether you have good leadership and especially e-leadership. E-leaders require agility, i.e. the ability to create solutions incorporating latest IT developments quickly and in addition, they need to be able to orchestrate synergies between these multiple solutions / applications. Even CEOs need to be enabled to ask sensible IT-related questions which today very often does not seem to be the case. He therefore asked for the need to motivate people to a ‘deep dive’ which he equated to enabling them to become e-leaders.

This was followed by **Werner B. Korte** who put the position of the European Commission, underlining the impact of demographic change in the world, and that the new demands of consumers across the globe put new competitive pressure on Europe. The response must be to accelerate innovation! When referring to the multitude of European Commission activities in this area over the past years he made the strong point that the skills of e-leadership are essential for the Belgian, Dutch and European industry in general to maintain their excellent global competitive position and the need for universities and business schools to properly respond to the market demand with offers suitable to educate and train individuals to become e-leaders.

In this context the goal of the European Commission's initiative on e-Leadership which started in 2013 is to increase the talent pool of e-leaders for enterprises (CIOs, professionals, business leaders etc.). It was followed in January 2014 by a complementary initiative on e-leadership targeting start-ups, gazelles, SMEs (entrepreneurs etc.). Both are closely linked to the promotion of digital entrepreneurship and integrated within the EU long-term e-skills strategy and the efforts made to mobilise Member States and stakeholders (Grand Coalition for Digital Jobs) and raise awareness (e-Skills for Jobs 2014 campaign, http://eskills-week.ec.europa.eu/).
Panel discussion experts, at the event on ‘New Curricula for e-Leadership - Delivering Skills for an innovative and competitive Europe’ organised by the European Commission together with Antwerp School of Management being part of the University of Antwerp, the CIO Forum Belgian Business and EuroCIO – European CIO Association on 4th September 2014 in Antwerp.

Peter Hagedoorn, Secretary General of EuroCIO articulated the view of Europe’s CIOs and emphasised the importance of e-leadership skills and the activities which EuroCIO had started to compensate for the apparent lack of suitable higher and executive education offers in the market.

All introductory speakers therefore welcome the European Commission e-Leadership initiative which will help to improve Europe’s competitiveness. On support and developments in the e-leadership area they highly appreciated that Brussels had taken leadership here, to provide the necessary guidance and orientation and the initiation of first demonstrations of e-leadership higher and executive education programmes and courses.

These presentations were followed by two practical demonstrations of successful digital transformation processes in two companies.

Freddy Van den Wyngaert, CIO Agfa Gevaert, Chairman of the European CIO Association, Chairman of the Board of the CIOForum Belgian business presented the perspective of a CIO having to have e-leadership skills and acting as a facilitator and change agent to achieve a digital transformation of a company. He emphasised the importance of running such an undertaking as a business and not as an IT project and integrating target achievement and making it part of the HR appraisal system. For him a successful transformation process requires business people with IT skills, IT people with business skills, and on top of that strategic leadership skills, providing them with the capability to develop new IT-based customer centric opportunities, a vision and strategy.

Harold Rijckaert, Director Large Enterprise, SD Worx presented the perspective of a business executive emphasising the e-leadership skills are indispensable for supporting the transformation of an organisation and that these should be with as many staff as possible.

Lex Hendriks, Business Knowledge Consultant at EXIN asked for the establishment of a continuous dialogue between industry demanding e-leadership type individuals and universities and business schools expected to supply these to the market is needed to get out of the ‘jungle’ of the so far mostly unsuitable higher and executive education programmes for teaching e-leadership skills. This would help develop appropriate e-leadership higher and executive education programmes and help close the gap between demand and supply.
The European Commission e-leadership initiative has addressed this gap; dialogue is continuing and the curricula approach is intended to be implemented on an ongoing and continuous base.

Belgian and Dutch business schools are among the first in Europe to use the e-leadership curriculum development guidelines and apply the Curriculum Profile approach to their higher education courses.

**Piet Ribbers**, Professor at Tias Business School in Tilburg, reported about the results of a mapping of their Executive Master on Information Management to an e-leadership curriculum profile developed in the initiative. It had helped them to identify area of improvement for the programme to become a true e-leadership one. In his view a curriculum profile for e-leadership can “create transparency and comparability” urgently demanded in the market.

**Steven de Haes**, Professor at the Antwerp Management School reported using the Initiative curriculum profile to map two of their programmes. He found this a very useful tool.

Both, were impressed about the assessment process and expressed support for its wider use but would also welcome improvements to ensure assessment judgements are not just easy to make but also unambiguous. De Haes also proposed as a next step the development of further e-leadership curriculum profiles since they have identified the need for this in also other areas for instance one on IT Governance & Assurance.

Several experts concluded that the e-Leadership Curriculum Profile approach looks like an interesting one to carry out the mappings of existing courses and programmes in order to further develop and adapt them in a way to help satisfy the demand for these types of skills in industry and provide promising career opportunities to students.

The expert panel member Niek De Visscher emphasised that organisations due to the rapid development in ICT are losing their business models and but should see this as an opportunity not threat and use IT as an enabler. However, organisations have to build the capabilities for this and this is where e-leadership skills come into play. Today we can very often observe a failure in internal communications resulting in failure of translating a management strategy into an operation plan.

Frans Verstreken confirmed this argument and identified the rapid pace in which transformation is taking place as the major threat. He also stressed that staff in organisations have to themselves develop communication / negotiation skills since not all of this can be done in higher and executive education programmes.

Development of an appropriate ‘ecosystem’ was seen as another key direction for closing the skills gap since interaction with like-minded individuals was seen as essential to keep up with the pace of change. This requires e-leaders needing continuous interaction with a network of likewise people to keep up and to keep pace. The strong point was made that in the future young people will not accept working in a company which is not adapting to that model.
4 Recommendations

4.1 Introduction

During consultations and project workshops a number of proposals for further action have been made by stakeholders. Also, during the dissemination campaign, the project team made notes of the views of experts and stakeholder contributions. Podium discussions at RCEs also contained ideas for action. We have been through this material to draw together proposals for further action to foster e-leadership skills.

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

Figure 26 – Recommendations

The recommendations were vetted and discussed at a workshop attended by over 40 stakeholders on 11th Feb 2015 in Brussels.

4.2 Recommendation 1 – Broad adoption: Promote understanding of e-leadership and widespread adoption of the Guidelines

4.2.1 Background

As record levels of unemployment in Europe slowly subside, demand for ICT workers continues to outstrip supply and latest estimates indicate that this gap will continue to grow
by around 3% per year. The mismatch between the current skills available and the needs of the labour market concerns Member States across the EU, some of them more acutely than others. With regard to e-leadership, the most conservative assumptions yields an estimated 19,000 vacancies. Unless more is done to attract young people into computer science degrees and to retrain the unemployed, many of these positions will remain unfilled.

Guidelines and quality labels have been developed to address this gap. These build on the activities of the ICT Skills Workshop of CEN, and in particular the development of the European e-Competence Framework (e-CF). Also, the guidelines and quality labels are compatible with the European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET).

4.2.2 Recommended action

E-leadership curricula guidelines developed in conjunction with key stakeholders in Europe should be taken forward and promoted. The supply side of universities and business schools should be supported in keeping their programmes aligned with developing skills needs. As outlined in the guidelines, this can be achieved by activating knowledge located with employers in companies using ICT in Europe, providing feedback channels to enable that skills knowledge to be channelled to academics able to deploy up to date research and appropriate teaching methods and materials. Working with associations representing European CIOs and HR Directors etc. the European offer of e-leadership can be optimised and the skills delivered into enterprise innovation.

In this way by applying e-leadership curricular guidelines, key stakeholders can accelerate the scaling of Europe’s successes.

In order to increase familiarity an transparency of Curriculum Profiles, CPs, CPs should be extended to established Bologna processes and adopted of CPs in other cross-disciplinary areas.

4.2.3 Action summary

| Promote widespread use of the e-leadership curriculum guidelines |
| Keep Curriculum Profiles aligned with developing skills needs by ensuring effective feedback from employers and alumni. |
| Liaise with associations to ensure continual optimisation. |
| Support key stakeholders including leading business schools and active employers. |
| Extend links to Bologna processes and encourage adoption in other cross-disciplinary areas. |

4.3 Recommendation 2 – Certification: Foster appropriate certification structures for e-leadership skill documentation and transparency.

4.3.1 Background

Employers throughout Europe are looking for people capable of exercising e-leadership in their organisations, kick-starting their innovation portfolios, capitalising on ever-new capabilities of information and communication technologies and delivering value as competitive position. Standard techniques for investigating and classifying the relevant competences take large amounts of very skilled time. Transparent, comparable certification instruments can be a key contribution to accelerating assessment. There is currently no recognised certification for e-leadership skills, and this should be redressed.
4.3.2 **Recommended action**

Establish and propagate best practice in the certification of e-leadership skills. Attention should be paid to the validity and transparency of certificates at European level. Employers must be able to trust and compare contents. Students must be able to accrete certification as their skills grow and as they invest their time in remote and mixed mode programme participation and achieve learning outcomes. As the skills accrete, the student should be able to show a coherent match to recognised standards to employers. Current certification practice should be reviewed and work done with stakeholders to define one or more certification techniques issuing documents common across the EU, at European level.

4.3.3 **Action summary**

Establish and propagate best practice in the certification of e-leadership skills.
Pay due attention to the validity and transparency of certificates.
Ensure employers are able to trust certificate issuers and can easily and validly compare content.
Define certification is common across the EU.
Enable students to build on previous certification (LLL).
Provide a coherent match to e-leadership Curriculum Profiles.

4.4 **Recommendation 3 - Governance: Encourage stakeholders to establish governance for e-leadership development, quality assessment and recognition**

4.4.1 **Background**

Currently, initiatives taken by a European association of chief information officers, EuroCIO, have given rise to good governance structures for an own programme of educational offers. Some of these structures are relevant to fostering e-leadership skills based on the European Guidelines and Quality Label. The scaling-up requirements have been identified, and prototype web-based support has been reviewed. Other key organisations have expressed interest in taking a role in governance of e-leadership skill development, capitalising on the new European Guidelines and Quality Label.

One key requirement for governance is minimisation of resource requirement for each approved e-leadership educational programme. The governance should be extended to include such a set of organisations as will be trusted by the key stakeholders – employers, students and educational institutions.

4.4.2 **Recommended action**

Encourage dialogue with top European associations and other key stakeholders.

Elicit stakeholder requirements for governance and willingness to take on responsibility for governance roles

Elicit barriers to participation.

Specify processes and identify necessary resources for all participation roles.

Encourage the structuring of each role and the development of a clear business case to accelerate approval by the decision body (board, membership) of the stakeholder concerned.
Address other barriers to participation of key stakeholders.

Capitalise on best practice in governance structure and processes. Assess governance structures in related areas of education and human resource management. Identify examples of best practice in effective and lean (low resource) governance. Assess existing best practice for the opportunity and value of transfer to the governance of e-leadership programme generation, offer and teaching.

### 4.4.3 Action summary

| Encourage dialogue with top European associations and other key stakeholders, establish leadership of core group |
| Elicit stakeholder requirements and willingness for governance roles. |
| Specify processes and identify necessary resources for roles. |
| Establish business cases for key roles |
| Address other barriers to participation of key stakeholders. |
| Capitalise on best practice in governance structure and processes. |
| Identify best practice in effective and lean (low resource) governance. |
| Assess best practice for transfer to the governance of e-leadership programme supply. |

### 4.5 Recommendation 4 – PR/Portal: Support operation of governance by setting up online services for e-leadership skill development, for the target groups and for institutions of higher education and business schools.

#### 4.5.1 Background

Recent developments of portals at national and European level supporting labour markets for a full range of qualification markets. However, there is as yet no little online support for candidates to identify needs for further skills development to make up for deficits of skills they could acquire which are in demand. Such support is not available for e-leadership skills.

Also, there is a need to keep offers of information on e-leadership properly focussed, outside markets dealing with entirely different skill sets.

#### 4.5.2 Recommended action

Stakeholder consultation should be carried out to identify willingness to host a permanent e-leadership skills development portal at European level. Prototypes of portal content, user dialogue and general functionality developed in response to the current initiative on new curricula for e-leadership should be provided as models for emulation.

#### 4.5.3 Action summary

| Carry out stakeholder consultation to identify willingness to host a permanent e-leadership skills development portal at European level. |
| Enable use / emulation of prototypes developed in response to the current initiative on new curricula for e-leadership of portal content, user dialogue and general functionality. |
| Include academic contributions and testimonials in online presence |
4.6 Recommendation 5 – MS Action: Extend cooperation at global level and capitalise on Member State initiatives

4.6.1 Background

Recent Regional Cluster Events have revealed that awareness of e-leadership skill requirements are not equally distributed across Europe.

Publications by large consultancies on the need for improved leadership at corporate level to take advantage of innovation opportunities in ICT have started to generate activity across the globe.

Given the current speed of developments, there is a need to continue monitoring of action at nation state or regional level to meet e-leadership skill requirements and demand, addressing emerging shortages, gaps and mismatches.

Less advanced economies see a potential to leap-frog their advanced competitors by more rapid exploitation of IT trends. There is strong interest from China in provision of e-leadership skill development programmes.

4.6.2 Recommended action

Encourage participation of Member State national governments and agencies in carrying forward acceleration of e-leadership skills provision

Monitor key performance indicators and scenarios on the supply side and demand side of e-leadership skills and benchmark these KPIs against national policy initiatives and multi-stakeholder partnerships in all Member States.

Monitor action by Member States and globally

In addition, there is a need to support cooperation and exchange of information on European and national Member State policies initiatives and policy documents, along with key stakeholder initiatives, projects, best practices, reports and studies. This cooperation should be centred on thematic areas or major initiatives and where appropriate, the results of an impact assessment of identified e-leadership initiatives would be discussed.

European and national Member State policy initiatives and programmes targeting entrepreneurs and business start-ups should be assessed as to whether and how e-leadership skills are taken into account. Then e-leadership skills should be mainstreamed within entrepreneur-training programmes and in the requirements specifications for funding: for example, in the context of structural funds spending related to business start-ups in knowledge-intensive parts of the economy. Secondly, an assessment of the impact of the identified e-leadership initiatives could be carried out.

4.6.3 Action summary

Encourage action by Member State national governments and associations.
Monitor and benchmark action by Member States against global key performance indicators.
Consider integration with existing benchmarking/ scoreboards.
Improve future-proofing of policy using scenarios of ecosystem development.
Initiate discussions at global level on a coordinated approach.
Support exchange of Member State policy initiatives and dissemination of best practice.
Ensure participation of key stakeholder initiatives, projects, best practices, reports and studies. Include relevant sectors such as education and health.
Assess related policy to create integrated European policy approach to e-leadership skill development. Focus on innovation not just science.
Bring e-leadership skills into entrepreneurship programmes and innovation incubators. Consider foundations of e-leadership skills at earlier stages of education.
Ensure public funding schemes are open for e-leadership education and training programmes; make funding transparent and visible.
Encourage assessment of the impact of identified national e-leadership initiatives.

4.7 Recommendation 6 - MOOCs: Stimulate best practice in blended e-leadership programme delivery

4.7.1 Background

In today’s teaching of e-leadership skills, traditional techniques of teaching predominate in the most effective programmes.

As of mid 2013, there were only some 21 programmes for developing e-leaders in Europe, an offer which must be significantly extended to meet demand. Extended supply should make use of new teaching methods to minimise costs to students and employers.

Individuals entering and currently in the workforce need an improved supply in order to develop the portfolio of skills and competences that e-leaders require.

In general, MOOC development has not yet taken off, key proponents have even been leaving the field. Yet e-leadership skills are a prime topic for remote delivery; those seeking the skills are often in responsible positions with no desire to spend time learning outside the working environment.

4.7.2 Recommended action

To foster e-leadership skills development, best practice in mixed mode teaching strategies for e-leadership should be identified and propagation of this practice encouraged. Best practice teaching strategies will deliver multiple benefits to participants in a cost-effective manner. They will maintain networking value to participants; focus and minimise teaching staff time; deliver the set e-leadership learning outcomes, including those which require individual study, and enable a maximum of continued active leadership during a programme. Best practice in optimising networking may be focussed on short summer residential phases. Media designed for MOOC delivery may form part of the approach.

A greater number of educational institutions could to team up with industry and roll out a range of e-leadership curricula and e-skills courses, while re-defining and enhancing teaching formats. According to a European CIO association, many universities want to add technological depth to their programs but do not have the resources to do so. By establishing cooperations and making use of recorded content, these schools can be given access to these resources and thus be able to deliver new content, course and program development.

European universities should be encouraged to make greater use of Massive Open Online Courses (MOOC) to encourage far more students to enrol in their e-leadership skills courses.
Despite the challenges presented by this online format, MOOCs can open up a whole new range of opportunities for teachers and students alike. Developed as entry-level courses, MOOCs can be designed to attract greater numbers of students to study e-leadership skills. In order to kick-start this initiative, the Commission together with the Member States could support e-leadership MOOC demonstrations through a dedicated project. With some initial funding, universities could compete in a Europe-wide competition for the best and most successful e-leadership MOOC. Such an initiative could be operated by key stakeholders such as the ICT industry, ICT and CIO associations etc., representing both the demand and the supply side of the market. This would help in promoting and raising awareness of MOOCs throughout Europe on the one hand and their wider dissemination throughout the educational sector on the other hand.

4.7.3 Action summary

| Identify best practice in mixed mode teaching strategies outside the e-leadership field (e.g. SAP) |
| Adapt best practice to develop blended e-leadership programme delivery - include webinars and consider using small MOOCs for marketing |
| Observe key requirements for e-leadership programmes: maintain networking value to participants, e.g. providing integrated short summer residential phases; focus / minimise teaching staff time; deliver a conformant set of e-leadership learning outcomes, including those which require individual study and enable a maximum of continued active leadership during a programme. |

4.8 Recommendation 7 – e-CF: Further enrich the European e-Competence Framework

4.8.1 Background

Acceptance of the e-Competence framework in enterprises and public organisation across Europe has been growing rapidly in the recent past. There is now a strong opportunity for leveraging content and tools across specialised areas of e-skills such as e-leadership. By linking to the Framework, added value is delivered to personnel decisions and the rationalised approach to human resources planning.

4.8.2 Recommended action

The e-Competence Framework should be adopted as standard competence framework for all e-leadership curriculum profiles. To increase coherence and add value to the use of the e-CF as reference, efforts should be undertaken to encourage convergence of disparate but related national and corporate competence frameworks in the realm of e-leadership and e-skills.

4.8.3 Action summary

| Maintain use of the e-Competence Framework as standard competence framework for all e-leadership Curriculum Profiles. |
| Undertake efforts to ensure completeness and add value to the use of the e-CF as reference in the e-leadership field. |
Encourage convergence of disparate related national and corporate competence frameworks in the realm of e-leadership and e-skills.

Track the developing understanding of e-leadership skills and consider the mode by which e-leadership skills are incorporated in version 4.0 of the European e-Competence Framework (e-CF).

### 4.9 Recommendation 8 – SME e-Leaders: Extend concept of e-leadership to SME, consulting, entrepreneurial activity and self-employment

#### 4.9.1 Background

To boost entrepreneurial activity in Europe, the Commission launched an Entrepreneurship 2020 Action Plan (COM (2012) 795 final). This is designed to “unleash Europe's entrepreneurial potential, to remove existing obstacles and to revolutionise the culture of entrepreneurship in Europe”. The Action Plan will also change the public perception of entrepreneurs and of entrepreneurship education. An increasingly important aspect of entrepreneurship is digital entrepreneurship. It is important that future efforts from the Commission help create a digital entrepreneurial culture and help attract, develop and retain digital entrepreneurial skills and talent.

A widespread consensus haunting Europe is that its management is old fashioned and lags behind that of the new world, notably the USA and parts of Asia, in its ability to turn innovative potential into business opportunities. Among e-leaders, it is important to keep in mind, that entrepreneurs (not only digital entrepreneurs) and freelancers will play an increasing important role. While it is easier to mobilise groups and associations of ICT practitioners, CIOs and managers, it will be crucial to address the needs of entrepreneurs and freelancers.

Education for entrepreneurship is already high on the agenda in most EU Member States, which have put in place a wide variety of programmes and activities. Here, e-leadership skills are of essential importance. The Commission’s Entrepreneurship 2020 Action Plan (COM (2012) 795 final) already includes a reference to e-leadership skills.

Increasing awareness of the attractive opportunities for people with e-leadership skills and more generally promoting the acquisition of e-skills as an excellent choice for young Europeans has been at the centre of Commission long term e-skills strategy. Having organised events surrounding the e-Skills Week in 2010 and 2012, the Commission is actively planning further awareness raising activities in the context of the “Grand Coalition for Digital Jobs”. To this end, the Commission wish to involve a larger number of key stakeholders in a variety of activities throughout Europe and in all EU Member States.

#### 4.9.2 Recommended action

The Commission, national governments and other key stakeholders including relevant associations and federations need to continue to play a key role in awareness creation and promotion of e-skills in general and e-leadership skills in particular. Formats like the e-Skills Week and the Get Online Week have proven to be a suitable format for addressing a broad range of target groups. It is therefore recommended to continue to use existing formats but adapt them to specific new requirements.

Additional formats for awareness raising and promotion of e-leadership skills, such a mentorship programs, need to develop and moreover involve different actors, which are
likely to be the many associations and federations representing the demand side of the ICT job market.

Hence, the key actors that need to be activated are those bodies that represent European CIOs and HR managers etc. These include EAPM (European Association for People Management), EHRF (European Human Resource Forum), EURES (EUROpean Employment Services), and eurociett (European Confederation of Private Employment Agencies). Raising awareness of e-leadership skills needs to become an integral part of their European and national agendas, including those designed for their annual conferences and networking events.

Aligning the Entrepreneurship 2020 Action Plan with related Commission policy action is essential to foster e-leadership skills successfully across a variety of firms and sectors. The role of ICT and e-leadership skills as enablers of successful entrepreneurial activity needs to be emphasised in the entrepreneurial learning initiative. Experience suggests that becoming a digital entrepreneur has a strong appeal to highly educated young people – a fact which should be exploited for reaching out to the target audience of the learning initiative.

EU Member States have also been urged to offer pre-university students the opportunity to have at least one practical entrepreneurial experience before leaving compulsory education, such as running a mini-company, being responsible for an entrepreneurial project for a company, or engaging in a social project. The acquisition of entrepreneurial abilities enhances the employability of youth: according to recent research, 78% of entrepreneurship education alumni were employed directly after graduating at university, against 59% of a control group of higher education students.

From these activities the Commission concludes that “EU higher education in entrepreneurship can boost high-tech enterprises and high-growth companies by supporting business ecosystems, partnerships and industrial alliances.” It is further proposed to apply the guidance framework to entrepreneurial schools and VET institutions, developed by the EC in collaboration with the OECD and currently being promoted across Europe. These schools should take full account of the essential role of e-leadership skills for 21st century entrepreneurs.

### 4.9.3 Action summary

| Continue awareness creation and promotion of e-leadership skills capitalising on established formats (e-Skills Week etc.) |
| Create additional formats for awareness raising and promotion with multiple stakeholders on the demand side |
| Involve bodies representing European CIOs and HR managers (EAPM, EHRF, EURES, Eurociett etc.) |
| Align the Entrepreneurship 2020 Action Plan with the actions of DG GROWTH |
| Foster e-leadership skills across a variety of firms and sectors |
| Ensure pre-university students are offered the opportunity for entrepreneurial experience |
| Apply the EC/OECD guidance framework to entrepreneurial schools and VET institutions |
4.10 Recommendation 9 – Skills variety: Continue stakeholder dialogue to stimulate supply-side response to the variety of e-leadership skills requirements across the economy

4.10.1 Background

The study of e-leadership is a relatively recent discipline, and though there is broad understanding among stakeholders what the key features of skill sets are, it is expected that the skills do vary by setting in the economy.

In addition, there is a need for more precise and shared definitions and metrics of e-leadership skills and competencies to demonstrate what kinds of e-leaders are associated with specific kinds of business and social value creation. It must be ensured that curricula and e-leadership development efforts are relevant and monitoring of demand and supply of e-leadership skills must be improved – in line with sectoral requirements.

Until now, CIOs have played an important and active role, in large part because they are part of well-organized European CIO networks and they have expressed clear needs and requirements. There is a need to complement their contributions by involving business line managers, CxOs, entrepreneurs, and freelancers. This can be more challenging, as these groups are less well organized. Also, common awareness of e-skills needs has not developed.

4.10.2 Recommended action

Case studies and surveys covering the connection between e-leadership skills and innovation performance, clear identification of types of e-leadership and matching of effectiveness to innovation settings – corporate, SME, entrepreneur.

It is expected that the development of e-leadership can be markedly accelerated with engagement with non-IT business leaders, such as Chief Executive Officers, Chief Financial Officers and Chief Marketing Officers, as well as with digital entrepreneurs. Whereas to date considerable insight and input has been provided by Chief information Officers, other members of senior management teams can identify new critical skills required by their strategy and create a detailed inventory of how to access them. The same information will be necessary form entrepreneurs and freelancers communities. A trusted neutral party could be engaged to collect and synthesize lessons from applications of e-leadership to ensure the definitions are broad enough to cover all relevant cases of ICT-informed leadership in today’s enterprises and precise enough to be practical and insightful.

Further attention needs to be paid to using these results for the development of an e-leadership skills framework as an extension of the European e-Competence Framework (e-CF) for ICT practitioners. This would be used by organizations in the public and private sector to identify and inventory key skills for accomplishing their strategic objectives.

The further development and sharpening of metrics for e-leadership skills is a field for Commission leadership. Here, regular engagement with a broad set of stakeholder groups, such as C-level business executives and digital entrepreneurs, will be essential to success. Such an activity could be initiated as an integral part of on-going studies in which all relevant stakeholders are involved in dialogue. Stakeholders include industry, education, training and certification institutions, academia, the CEN Workshop on ICT skills, Eurostat, the national statistical institutes, national employment agencies and staffing industry representatives at national and European levels.
4.10.3 Action summary

Commission case studies and surveys covering the connection between e-leadership skills and innovation performance, clear identification of types of e-leadership and matching of effectiveness to innovation settings – corporate, SME, entrepreneur. Monitor use of e-leadership skills to ensure adequate breadth, validity and usefulness. Further develop metrics for e-leadership skills. Engage with industry, education, training and certification institutions, academia, the CEN Workshop on ICT skills, Eurostat, the national statistical institutes, national employment agencies, staffing industry representatives at national and European levels, C-level business executives and digital entrepreneurs.

4.11 Recommendation 10 – Gap monitoring: Establish and disseminate robust estimates of supply and demand

4.11.1 Background

Current quantitative data and statistics on the identification and anticipation of shortages, gaps and mismatches is inadequate to understanding demand and supply of e-leadership skills. There are few data sets from existing sources of any relevance, and these have a poor match. The lack of data significantly restricts the actions of a broad set of stakeholder groups. New and better data would help defining priorities and measuring progress.

4.11.2 Recommended action

Given engagement of a broad set of stakeholders and clear, sharp metrics for e-leadership skills, the following initiative would help establish regular monitoring and forecasting of the demand for e-leadership skills and its relationship to supply volumes and types:

- Use revised, appropriately broad definitions of e-Leadership with a clear contribution to enterprise-level innovation, competitiveness and growth for Europe.

- Identify relevant, regularly updated, existing data sources for possible re-use including extraction of information on demand and supply of e-leadership skills required by policy makers as a basis for decision making.

- Analyse relevant Eurostat data to be able to project trends and results from samples across the EU, and to ensure homogenous data across all EU Member States.

- Specify requirements for data not covered by existing regularly generated, public data for establishing meaningful measurements for use in the monitoring and projection system. This is expected to require data collection using two types of survey: those of demand side actors (e.g. HR managers, CIOs in organisations) and those of suppliers (e.g. universities and business schools);

Actions should be conceived as a coordinated, Europe-wide activity, carried out by the Commission in close cooperation with Eurostat and national statistical institutes.

Data on the development of demand should be made available widely, in order that universities and business schools initiate appropriate course development, and European industry should be given robust and timely information about e-leadership courses initiated at universities and business schools.
Insights into market development will also enable policy makers to propose and coordinate better ways and more efficient means to reduce e-leadership skills shortages, gaps and mismatches.

4.11.3 Action summary

| Identify existing data sources for information on demand and supply of e-leadership skills. |
| Ensure definitions of e-Leadership are appropriate to policy (related to innovation and growth) |
| Analyse relevant Eurostat data (project trends, ensure homogenous data across EU). |
| Specify requirements for new demand and supply side data and establish a complete monitoring and projection system. |
| Coordinate activities across Europe. |
| Disseminate demand trends to trigger university and business school offers |
| Provide European industry with robust and timely information about e-leadership courses initiated at universities and business schools. |
5 Stakeholder positions

5.1 European regions taking action

In parallel with the regional cluster events, discussions took place with stakeholders across Europe about their related plans and activities. Many statements of intent were captured from this, as were links to current activity at regional level, summarised here as a set of stakeholder positions.


The Agenzia per l'Italia Digitale cooperates with all key stakeholders in the field and strongly supports adoption of the European competence framework (e-CF). We very much welcome the European Commission initiative on e-leadership which is fully aligned to our national activities, and our national coalition for digital competences is likely to include dedicated action on e-leadership.

**Italy: Antonello Busetto, Director Assinform**

Education is the key enabler for innovation and growth. Assinform recently appointed a Steering Committee to oversee contributions to the European Digital Agenda, and intends to work closely with the Ministry of Education, universities and the Agenzia per l'Italia Digitale to ensure the objectives in Italy are fulfilled.

**Fulvia Sala, Secretary General, AICA**

AICA is strongly committed to the European initiative on e-leadership and already offers an e-leadership foundation programme for students of high schools, with e-learning support. New partnerships, the Future IT leader and with healthcare CIOs AISIS, are expected to provide detailed new e-leadership profiles.

**Spain: 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.

**France: Christian Colmant: Délégué Général, 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.
United Kingdom: Nigel Payne, TechPartnership

The European e-Leadership Initiative comes at an apposite moment for scaling up efforts and joining forces across the continent, in 2015 and beyond. The UK Tech Partnership has committed programmes in place to deliver the e-leadership competence industry requires.

Germany: Erik Neumann, EIT ICT Labs, German government, industry and academia initiative ‘Software Campus’

German enterprise and the Mittelstand need expert leadership for maintaining their innovation edge. Software Campus, funded by the Federal Ministry of Education and Research, strongly supported by industry, building on activities with the direct patronage of the Chancellor, Angela Merkel, is very well-placed to participate in scaling up the supply of e-leadership skills in Germany and in Europe.

Ireland: Gerard Walker, Expert Group on Future Skills Needs- Ireland, Department of Jobs, Enterprise and Innovation, Ireland

The Expert Group on Future Skills Needs- Ireland have undertaken extensive research with the objective of building up Ireland’s ICT skills capability. A key action identified is the need to build-up e-leadership professional skills to drive increased innovation and business value from the application of ICT within enterprises.

Portugal: Raquel Costa, Departamento da Sociedade de Informação, FCT Fundação para a Ciência e a Tecnologia, MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

The National Coalition for Digital Jobs in Portugal recently set out to greatly increase the supply of digitally skilled professionals to better match the demand. The Coalition has as a main goal the Growth of Businesses and Employment in ICT, and here in particular e-leadership skills are being fostered to boost growth and competitiveness.

Latvia: Arnis Daugulis, Deputy State Secretary (ICT & E-Government) at Ministry of Environmental Protection and Regional Development of the Republic of Latvia and responsible for defining ICT and E-Government policy, strategy and implementation plans for the government of Latvia

The e-skills National coalition of Latvia, which draws together government and stakeholders from ICT industry, NGO and academia, fully supports the EU E-leadership skills initiative. Without e-leadership, government officials will be pushed out of their comfort zone and find themselves in unknown territory, dealing with innovation.

A CIO should set the ground for digital transformation. To fulfil this role, the CIO must not only be a master in ICT but also have the business skills to transform organisations, including the ability to speak in non-technical language, to listen, learn, negotiate and convince, to think creatively and willingly adapt to rapid change.

Malta: Matthew Gatt, eSkills Malta Foundation

The eSkills Malta Foundation has begun strongly promoting the European e-leadership curriculum profiles with our higher education institutions. Promotion is expected to
encourage attractive new e-leadership academic offerings, and this development will be supported by benchmarking existing offerings against these new standards.

**Croatia: Žarko Cizmar, President of Telecentar, Digital Agenda for Creative Croatia**

The Digital Agenda for Creative Croatia is a multi-stakeholder partnership of organisations and individuals from the civil, public and private sector. The main activities include new curricula for vocational schools, higher education institutions and training centres.

**Greece: Pantelis Nikolaidis, General Secretariat for Gender Equality, Ministry of Interior**

Innovation is now increasingly recognised in Greece to be the key driver to long-term competitive advantage. Already from the start of the crisis, e-leadership became one of our commitments. The Women and Girls Go Digital Coalition is developing a functional ecosystem of entrepreneurs, business people, policy makers and academia to assist women in pursuing ICT careers and e-leadership.

### 5.2 Industry - leadership experience and skills demand

**Agfa ICS, Freddy Van den Wyngaert, VP, CIO**

Agfa has implemented a major and very successful transformation of its business and is determined to continue this success by ensuring executives bring with them the best in e-leadership skills.

**Volvo Information Technology, Małgorzata Ryniak and Magdalena Tarasiewicz**

Volvo is investing in our IT people so that they are being empowered to lead for us. The greater quality and coherence in the offers of e-leadership education in Europe the Commission has initiated is very attractive to us.

**Telefonica España, Cristina Alvarez, CIO**

The Commission initiative to improve the supply of e-leadership competences is of great interest to us; we expect to make significant use of programmes which deliver these competences.

**Euro Disney, Bruno Brocheton, VP IS, Vice President, CIGREF & CIGREF, Pascal Buffard, Chairman, also Chairman of AXA Technology Services**

For CIGREF, the "e-leadership" theme is a top 10 challenge for leaders and managers towards 2020. Leading digital transformation means first the capability to develop a strategic vision related to digital with all stakeholders. CIGREF encourages the intensification of actions related to the promotion of e-leadership in Europe towards all economic actors.
**Fondazione Don Gnocchi, Giuliano Pozza, Direttore Organizzazione e Sistemi Informativi (DOS)**

Massive investments in digital innovation to provide quality and sustainable health services could be ineffective without governance methodologies and true e-leaders. Fortunately, we are not short of sound methodologies, but e-leaders are scarce and it takes a long time to move from a good manager/professional to an e-leader. The need for true e-leaders has never been stronger than now in healthcare!

**Hewlett-Packard, Stefano Venturi, Managing Director Italy, Confindustria Digitale lead for “Digital Culture and Competencies” Steering Committee**

Implement a Public & Private Partnership for e-Leadership in order to promote Digital Culture and Competencies in Enterprises, Public Administration and School System. This means closing the technological gaps and enabling a digital inclusion for everyone thus supporting the European digital citizenship.

**Pantheon Automatisering, Frans Verstreken, Business Development Partner**

Pantheon is absolutely resolved to recruit and train the best in e-leadership. To continue to innovate, we must always refresh our e-leadership capability, recruiting and training more staff with this mind-set and competence.

### 5.3 European associations prepared to lead

**EuroCIO, Peter Hagedoorn, Secretary General**

EuroCIO strongly welcomes the participation of DIGITALEUROPE, CIONET and PIN-SME to bring this initiative forward. We see our role as promoting e-leadership in Europe in cooperation with service providers like EXIN, APMG and ASIIN. Curriculum Profiles will bring transparency to the interface between industry demand and higher and executive education supply ensuring that education programmes are developed which best meet industry requirements.

**CIONET, Frits Bussemaker, Partner**

CIONET has been involved in the Commission initiative from the start, as our members are in positions of IT responsibility in European organisations - they are already innovation drivers and e-Leaders. We intend to continue and help coordinate the offer of e-Leadership programs which match the curricula profiles developed by top academics in the field.

**DIGITALEUROPE, John Higgins, Secretary General and Jonathan Murray, Director**

DIGITALEUROPE is willing to contribute to establishing a simple and industry focused governance ecosystem that will promote effective e-leadership programme development, quality assessment and recognition.
IndustriALL Europe, Philippe Saint-Aubin and IG Metall, Karl-Heinz Hageni

With some 200 affiliated unions and more than 7 million members, IndustriALL Europe is the workers’ voice in metalworks, chemistry and clothing industries. It supports all actions boosting growth and high quality jobs in Europe. The European e-leadership initiative goes into that direction.

Irish Computer Society and the Health Informatics Society of Ireland, Mary Cleary

ICS has launched a Leadership Development programme for senior IT managers and those who will potentially become CIOs. ICS is committed to serving the needs of top-tier executives and to continue to enable them to share best practice in strategic IT leadership and driving innovation. Through this commitment, ICS is eager to support EU level initiatives for e-leadership skills development and to present actions in a coordinated way at national level.

5.4 Europe's Academia in the e-Leadership Coalition

Henley Business School, University of Reading, Sharm Manwani, Executive Professor of IT Leadership, Professor Kecheng Liu, Chair of Informatics and E-Business

Henley Business School has a strong tradition in conducting doctoral research, teaching higher qualifications and educating executives in e-Leadership disciplines. Henley has contributed to the e-leadership initiative and has adapted its BEA programme to optimise correspondence with the corresponding e-Leadership Curriculum Profile. Henley's Dean, Professor John Board is committed to further enhancing e-Leadership capability both for Henley and its customers, in partnership with key stakeholders.

Universitat Politècnica de València, Eduardo Vendrell, Professor, President, Spanish Council of Deans of Informatics Degrees

In my role as President of the Spanish Council of Deans of Informatics Degrees, I will promote the e-Leadership guidelines and curriculum profiles throughout the Spanish universities since I am confident that following the curriculum profile approach of this initiative will allow universities and business schools to develop fully fledged e-Leadership courses demanded by industry throughout Europe.

IE Business School, Silvia Leal, Academic Director

IE Business School was among the first in Europe to use the e-leadership curriculum development guidelines and apply the Curriculum Profile approach to their higher education courses and is since November 2014 delivering a programme helping individuals to achieve the e-leadership skills in high demand in the market. We strongly recommend that other universities and business schools use the e-Leadership Curriculum Profile approach.
Fondazione Mondo Digitale & University of Edinburgh Business School, Alfonso Molin, Professor and Scientific Director & Multi-sectoral Network on Educational Robotics, Italy

The e-leadership initiative of the European Commission comes with the very timely aim of improve innovation performance, strengthening European industry. The Fondazione will work with other interested parties to make use of the guidelines and the e-Leadership Curriculum Profile approach. Alignment of educational programmes to the curriculum profiles are expected to provide promising career opportunities to executives and other employees.

University of Technology Wroclaw, Faculty of Computer Science and Management Wroclaw University of Technology, Adam Dzidowski, Poland

The most important part of the e-leadership package appeared to be its reflexive potential and how it could be used to pose the right questions about the existing programmes. The regional conference in Wroclaw helped us understand that in order to sustain the global position of Polish IT specialists we need combined efforts of computer science and managerial education, sometimes in brand new areas.

l’Ecole de Management des Systèmes d’Information de Grenoble, Chair Orange – GEM « Digital Natives », Prof. Dr. Renaud Cornu Emieux, Directeur

For the coming year, the chair “Digital Natives” Orange-Grenoble Ecole de Management and EMSI will lead the development of modules and certificates in e-leadership for students of the main curriculum of Grenoble Ecole de Management (GEM). These modules and certificates will be for students and working professionals.

Università di Salerno, Fisciano (SA), Filomena Ferrucci, Professor

The University of Salerno has activated a new study programme to address the needs of professionals for competencies both in information technology and business which enable them to drive change and innovation, to be e-leaders. This programme meets the e-Leadership guidelines, showing it addresses industry requirements.

University of Pavia, C.I.N.I consortium of Italian ICT universities, Marco Ferretti, Director and Professor, Computer Engineering Master Degree

In my position of head of the CINI Lab on ICT competencies, I envision the possibility to launch the collection of a wide set of assessments of programmes against the e-leadership curriculum profiles. We particularly welcome the link to the e-CF which we have agreed with Assinform and Assintel is an appropriate common dictionary of competences.

CEU - Central European University Business School, Achilles Georgiou, Program Director, MSc in IT Management

Constructing a huge ship might take a year but teaching the captain driving it can take even 30 years, similar to the captains e-leaders need to have specific skills and competencies in order to support their business in a continuously changing environment, managing their ship over bigger and bigger waves.
Organisations in Europe need to regain their competitive position by improving leadership of software driven business innovation. To improve the flow of e-leadership skill, Aalto University has recently 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.

Informatics Europe, Association of Computer Science Departments, Leszek Pacholski, Board Member

Informatics Europe (IE) is glad to see a dedicated effort on strengthening the ICT profession at the European level and offers to be a channel for promotion and dissemination of initiatives. IE is fully aware of the fact that informatics education in general lacks a focus on the business side, and we welcome cooperation on defining the best way of completing the competence body within informatics curricula.

Boriana Marinova, Nadine Burquel, EFMD

The priority at EFMD is to assist business schools and higher education institutions to transform their education processes and to assist them in adopting innovative teaching and learning approaches. We therefore welcome the initiative to promote e-leadership in Europe. Innovation guided by e-leadership is critical to promote smart, sustainable and inclusive growth in Europe and the economic competitiveness of the European Union.

5.5 Supporting e-leadership coalitions

EXIN, Robert-Jan Willemsen, Chief Commercial Officer

EXIN fully supports the European e-Leadership initiative. We see a role for our organization and our experts in the quality assurance for the register of approved Curriculum Profile mappings and the e-Leadership Quality Labels, and can support the mapping learning outcomes to the e-competence framework e-CF.

ASIIN, Birgit Hanny, Board Member

ASIIN supports the e-Leadership initiative and its Curriculum Profiles as instruments for developing high quality education offers at academic level.

APMG International, Richard Pharro, CEO

In the “Third Wave of IT-Driven Competition”, companies must look beyond the technologies themselves to the competitive transformation taking place, which requires new skill sets, including e-leadership. APMG can help by providing rigorous assessment and accreditation processes to make education and personal development more consistent, transparent and recognised internationally. Our experts can provide the quality assurance for approved Curriculum Profile mappings and e-Leadership Quality Labels.
ECWT – European Centre for Women and Technology, Eva Fabry

ECWT is collaborating with EuroCIO and CIONET to develop a strategy and concrete action plan to upgrade the e-leadership skills of female decision makers in larger enterprises.

Digital Leadership Institute, Cheryl Miller

As a recognised frontrunner in pan-European and global initiatives promoting digital leadership by girls and women, the Brussels-based Digital Leadership Institute (DLI) and its board members vigorously support initiatives that contribute to greater uptake of digital leadership skills by girls and women.

Human Age Institute, Loles Sala, Directora

The Manpower Group’s non-profit Human Age Institute was launched to return to society the knowledge from our mentors, as well as that of individuals, companies or institutions of various kinds. We have entered an age of "Talentism", and we must recognise that now, talent has emerged as the new engine of growth for organizations. This focus corresponds to the drive by the EU e-Leadership Initiative to provide skills that promote innovation, growth, and employment.