



e-Leadership Skills for Small and Medium Sized Enterprises

Country Report Estonia

A Snapshot and Scoreboard of e-Leadership Skills in Policy, Higher Education and the Labour Market

Authors:

Karsten Gareis
Philipp Markus
Eriona Dashja
Tobias Stabenow



With contributions from:

Helena Rozeik, Praxis

Contact

For further information, please contact:
empirica Gesellschaft für Kommunikations- und
Technologieforschung mbH
Oxfordstr. 2, 53111 Bonn, Germany
Tel: (49-228) 98530-0 * e-Mail: info@empirica.com *
Web: www.empirica.com

Bonn and Brussels, March 2015



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.

About this document

This document is a Country Report produced in the course of the service contract “e-Leadership Skills for Small and Medium Sized Enterprises”, or short “LEAD”. Services are provided under contract for the European Commission, DG Internal Market, Industry, Entrepreneurship and SMEs – Unit H/3 - Key Enabling Technologies and Digital Economy, Tender No. 288/PP/ENT/CIP/13/C/N01C012

About LEAD

LEAD develops targeted actions for start-ups and fast growing SMEs to provide them with relevant e-leadership skills and qualifications for entrepreneurs, managers and advanced ICT users that are recognized trans-nationally.

The LEAD consortium includes the partners: empirica, INSEAD, IE Business School, Henley Business School, Aarhus University, New Bulgarian University, Antwerp Management School, European Foundation for Management Development (EFMD), IDC Europe, PIN-SME and CIONET.

LEAD analyses the role of e-leaders in SMEs and entrepreneurial firms based on engagement with SMEs to gain insights into what

kinds of leaders SMEs rely on to ensure they can use ICT to develop, grow and compete, how SMEs use ICT to develop, grow and compete and what kind of e-leadership skills they need to succeed.

This work represents an important step forward towards helping business schools and SMEs collaborate and develop insights and a common language for SMEs to access and foster leaders who are both business and ICT-savvy (“e-leaders”) and who ensure SMEs use ICT effectively. It is laying the groundwork for the planning of targeted educational offers for SMEs and entrepreneurs by business schools and universities, which will be demonstrated within the project duration.

LEAD also engages with other stakeholder groups from education and the labour market, associations representing SMEs, start-ups and gazelles and others to take into account the target groups evolving requirements for e-leadership.

LEAD aims to sharpen the e-leadership definitions and metrics, specify data requirements for establishing monitoring mechanisms which can be used as a basis for policy making and to improve monitoring of demand and supply of these skills. Technology trends are analysed to understand their impact on new business models and organisation of companies and their e-leadership requirements. An overview of the present European e-leadership policy landscape for the different target groups is developed as well as an overview of the present European landscape of

e-Leadership courses and MOOCs. In addition a search and analysis of initiatives from industry, education and training organisations is carried out.

Content

1	e-Leadership Scoreboard	3
2	Policies of relevance to e-Leadership skills development	5
3	Stakeholder initiatives for the promotion of e-Leadership skills development	8
4	Assessment of policies and stakeholder initiatives on development of skills in e-leadership and digital entrepreneurship	12
5	Best practice policy and stakeholder initiatives	14
	Methodology	16

1 e-Leadership Scoreboard

The scoreboard offers an approach to monitoring and assessing issues related to e-leadership skills development, such as: education offers, workforce potential, exploitation opportunities, and enabling policies or other driving mechanisms. It compares European Member States, allowing for a comparative assessment of e-leadership performance of Member states. Doing so, it showcases relative strengths and weaknesses of national e-leadership ecosystems, thus informing and enabling policy discussions.

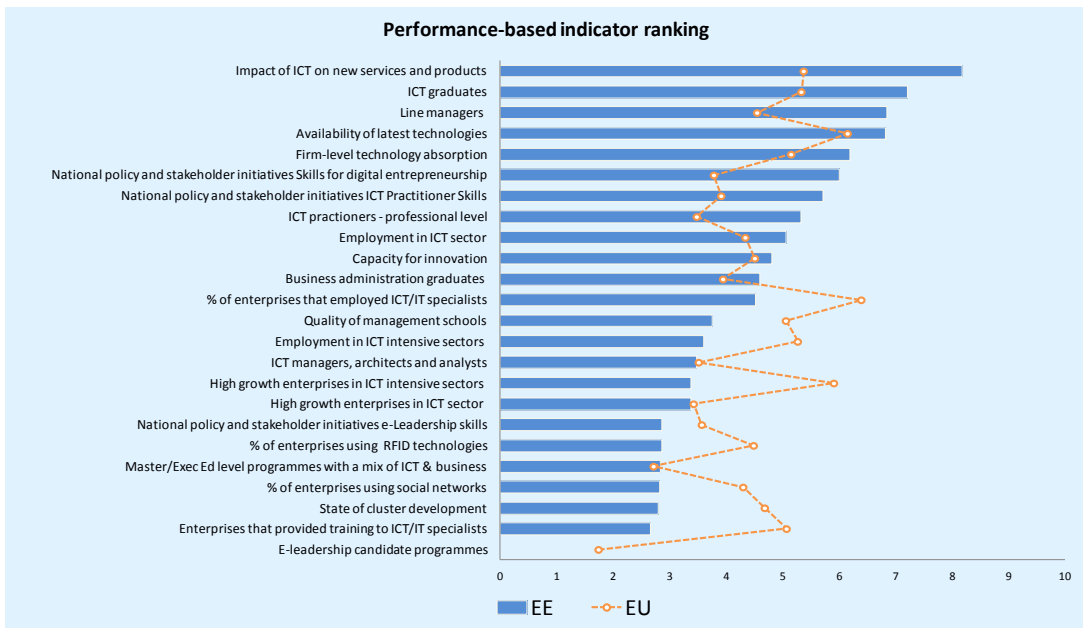
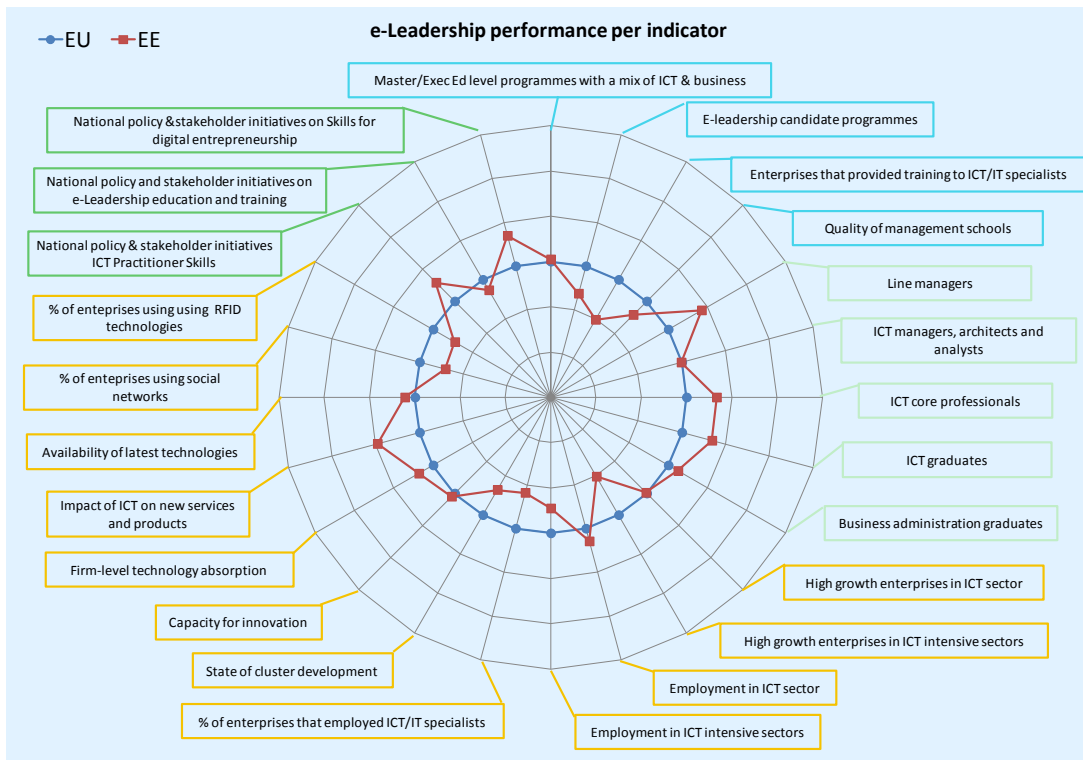
The e-leadership scoreboard comprises four levels: 24 indicators, 7 building blocks, 4 dimensions to be further aggregated to one overall e-leadership Index (eLI).

The “e-leadership skilling” dimension consists of one building block, “Education and Training”. This building block aims to capture e-leadership education and training through four indicators: The number of Master's/Exec Education level programmes with a mix of ICT & business (per population), the number of e-leadership candidate programmes (per population), the share of enterprises that provided training to ICT/IT specialists and quality of management schools. In the second dimension, “e-leadership workforce potential”, the e-Leadership Skilled Professionals and e-Leadership Pipeline building blocks aim to gauge the extent of e-skills/ICT practitioners and e-leadership in the workforce. The expectation is that e-leadership competences, as defined in the context of this study, prevail in or recruit from these two selected categories. Overall this dimension of the

Estonia		Rank:		13	
		Index score:		4.63	
		Value	Score (0-10)	EU 28 Rank	EU 28 avg.
e-leadership skilling	Education and training				
	Master/Exec Ed level programmes with a mix of ICT & business	4	0.15	23	40
	- per 100,000 population aged 20-59	0.5	2.84	8	1
	E-leadership candidate programmes	0	0.00	22	1
	- per 100,000 of workforce with potential e-leadership skills	0.0	0.00	13	0.4
	Enterprises that provided training to ICT/IT specialists	6%	2.67	22	9.6%
- SMEs that provided training to ICT/IT specialists	5%	2.86	22	8.4%	
	Quality of management schools	4.5	3.75	16	4.81
e-leadership workforce potential	e-leadership skilled professionals				
	Line managers	12,002	0.2	23	99,726
	- as % of total workforce	1.9%	6.8	8	1.3%
	ICT managers, architects and analysts	4,948	0.1	23	63,021
	- as % of total workforce	0.8%	3.5	11	0.8%
	e-leadership pipeline				
ICT practitioners - professional level	11,957	0.1	23	115,205	
- as % of total workforce	1.9%	5.3	7	1.48%	
ICT graduates (per 1000 population aged 20-24)	4	7.2	8	3.5	
Business administration graduates (per 1000 population aged 20-24)	25	4.6	10	22.14	
e-leadership skills exploitation	Business environment				
	High growth enterprises in ICT sector	20	0.1	22	235
	- as % of total number of high growth enterprises	4.7%	3.4	11	4.7%
	High growth enterprises in ICT intensive sectors	43	0.0	23	771
	- as % of total number of high growth enterprises	10.0%	3.4	18	13.3%
	Employment in ICT sector	13,072	0.1	26	154,090
	- as % of total employment	3.4%	5.1	10	3.0%
	Employment in ICT intensive sectors	49,892	0.1	25	789,975
	- as % of total employment	13.2%	3.6	20	15.0%
	Percentage of enterprises that employed ICT/IT specialists	18%	4.5	23	23.8%
	% of SMEs that employed ICT/IT specialists	16%	4.0	23	22.4%
	Innovation opportunities				
State of cluster development	3.7	2.8	19	4.17	
Capacity for innovation	4.3	4.8	12	4.22	
Firm-level technology absorption	5.4	6.2	14	5.18	
Impact of ICT on new services and products	5.5	8.2	4	4.88	
Technology trends					
Availability of latest technologies	5.8	6.8	14	5.65	
% of enterprises using social networks	24%	2.8	20	29.8%	
% of enterprises using RFID technologies	3%	2.9	14	4.14%	
e-leadership skills promoters	National policy and stakeholder initiatives				
	ICT Practitioner Skills	3.5	5.7	10	2.87
	e-Leadership education and training	2.0	2.9	14	2.25
	Skills for digital entrepreneurship	3.0	6.0	5	2.45

scoreboard looks to offer a proxy for the potential estimates of e-leaders in each country. A third dimension is entitled “e-leadership skills exploitation” and attempts to assess the friendliness of a country’s business framework and extent of its preparedness in exploiting opportunities provided by ICT. It contains three building blocks capturing aspects from Business Environment, Innovation Opportunities and Technology Trends in each country. The fourth dimension: “e-leadership skills promoters” rests on the proposition that countries with efficient enabling mechanisms (policies,

initiatives, etc.) are well positioned to produce the right mix of e-leadership skills in line with the dynamics of the job market demand and talent requirement. This dimension is composed of one building block which looks to capture insights on available programmes and initiatives focusing on e-leadership education and training targeting large companies as well as those targeting digital entrepreneurs and high-growth SMEs (gazelles).



2 Policies of relevance to e-Leadership skills development

Estonia's government has demonstrated strong commitment to developing the country's digital sector in an effort to use it for modernising society and national economy. Successive governments have initiated far-reaching policies mainly in the domains digital infrastructure, regulatory framework, e-government, e-business and e-security. As far as e-leadership skills and digital entrepreneurship is concerned, SMEs benefit from funding distributed by Enterprise Estonia (responsible for entrepreneurship and SME support), the Estonian Development Fund (Eesti Arengufond) and the network of technology parks. Estonia has a well-developed private start-up ecosystem including incubators and a business angel network, Estban, which provides help in terms of access to finance and commercialisation. The latter cooperates with the government on fostering digital entrepreneurship through the Association of Information Technology and Telecommunications.

The wider political background is set by the **National Reform Programme Estonia 2020**, which has the overarching aim to "maintain sustainable development" in the country. Some of the objectives defined in the document relate to e-leadership and digital entrepreneurship skills, albeit not explicitly: "harnessing the potential of the creative industries", "ICT and other key technologies for raising the value added of other sectors"; "developing human resources engaged in research and ensuring a future supply of engineers and top-level specialists"; and "bringing transportation, ICT and other public infrastructure that support business to an international level". The programme also covers measures for boosting ICT-driven start-up activity:

- Consolidation and simplification of entrepreneurship subsidies and implementation of new financing models;
- Continuation of Enterprise Estonia measures targeting entrepreneurs (basic training, mentoring, incubation);
- Continuation of supports for the development of knowledge and skills.

Estonia 2020 is umbrella document which describes in broad terms the main aims of Estonia's strategy for improving its competitiveness by the year 2020. Its objectives, as far as they are relevant for the e-leadership issue, are reflected and specified in a number of policies including the Digital Agenda 2020, Estonian Entrepreneurship Growth Strategy 2020, Knowledge-based Estonia 2014-2020.

Policy & Stakeholder Activity

Summary Assessment

e-Leadership education and training:

Recent multi-stakeholder partnerships in the higher education area have started to look into skills for e-leadership. One example is the IT Academy, an initiative for boosting the quality and focus of ICT-related higher education in Estonia with a strong focus on competitiveness. The key role of the ICT sector for the country's economy and self-image means that e-leadership is likely to become a widely recognised issue in the near future. The focus of policy-making in the area is on start-ups rather than longer established companies.



Skills for digital entrepreneurship:

The country has an effective national system for entrepreneurship support, at the centre of which is Enterprise Estonia, a business and regional policy foundation established in 2000. Enterprise Estonia is successfully channelling support from the EU structural funds into (mainly) ICT-driven start-up businesses, and provides a range of training measures for equipping start-ups with the necessary entrepreneurship skills. There are, however, so far few activities focusing explicitly on digital entrepreneurs.

The **Estonian Information Society Strategy 2020**, also called **Digital Agenda 2020** focuses on creating an environment that facilitates the use of ICT and the development of smart solutions in Estonia in general. The ultimate goal is to increase the economic competitiveness, the well-being of people and the efficiency of public administration. The general objective of the strategy is to contribute to achieving stronger growth, more jobs and increased welfare by creating an environment supporting the use and development of ICT solutions. To this end a range of specific measures and actions are proposed under four sub-objectives that correspond to key prerequisites of information society development. These support the development of information society both independently and in combination. Objectives and relevant measures of the strategy are as follows:

- ICT infrastructure for economic growth, smarter governance and the well-being of individuals;
- Better ICT skills for more jobs with higher added value, increased international competitiveness and higher quality of life (Increasing digital literacy for improving personal well-being; Development of advanced ICT skills, including follow-up initiatives of Estonian IT Academy, creating conditions for increasing the share of ICT professionals and e-leaders). More precisely the following initiatives are supported:
 - Support for the activities of Estonian IT Academy will be continued;
 - Set-up of an ICT awareness and career counselling program for students; the initiative is expected to have an (indirect) effect on digital entrepreneurship, as students who start working during their studies in IT companies are more likely to set up their own company in the future;
 - Promotion of an increasing number of graduates in the smart specialisation areas, e.g. the development of specific curricula, e.g. degree courses "IT Lawyer" (4 years) and "Health IT Specialists".
- Smarter governance and public administration (e.g. compulsory e-invoicing; improved inclusion and participation through ICT; better decision-making with ICT)
- Greater awareness of e-Estonia in the world.

Estonian Entrepreneurship Growth Strategy 2014–2020¹ – The general goal of the Estonian Entrepreneurship Growth Strategy 2014–2020 is to contribute to achievement of the objectives of the umbrella competitiveness plan "Estonia 2020" in terms of enhanced productivity and employment. To that end, the strategy seeks to deal with entrepreneurial and innovation policy within a single strategic framework that ensures the coherence between the policies which have, so far, stood apart at the strategic planning level. The entrepreneurship growth strategy seeks to create additional opportunities through actively contributing to an increase in the quality of human resources, the introduction of innovative business models, investing in development, enhancing multilateral co-operation, setting up a policy for boosting talent, and fostering creative industries. A major focus is on the role of ICT, including digital entrepreneurship and e-leadership. Actions with direct relevance to the current study include:

- Development of cooperation networks (raise awareness and increase R&D implementation capacity of enterprises – development of clusters and technology development centers);
- Development of demand-side policies (state will create a market for innovative products and services stimulating innovation activities);
- Fostering start-up development (helping new and innovative start-ups to take hold in the ICT and other growth sectors) e.g. by continuation of Start-up Estonia (see further below).

The main strategy document on Estonia's R&D policy is **Knowledge-based Estonia 2014–2020**, the Estonian Research and Development and Innovation Strategy 2014–2020, approved by Estonia's parliament in late 2013. Whereas the two previous R&D strategies focused on R&D capacity

¹ http://kasvustrateegia.mkm.ee/index_eng.html

building, the current strategy aims to exploit the established potential for the benefit of Estonia's development and economic growth. Priority setting in the strategy is based on the smart specialisation approach promoted by the European Commission's regional policy. The strategy document sees Estonia as an active and visible international cooperation partner in the field of R&D and innovation and outlines the aspiration of Estonia's research institutions to high quality and versatility. One of the aims laid out in the strategy is to make Estonia an attractive place for R&D and to motivate more people to choose a career in research. Furthermore, it emphasises the need for R&D to serve the interests of the Estonian society and economy as well as increase the knowledge-intensity of the Estonian economy in general.

Education is the main focus of the **Strategy for Lifelong Learning 2020**. Officially approved by the government on February 13 2014, its superior goal is to promote the development of a knowledge and innovation-based society. The goals and measures of the Lifelong Learning Strategy are concordant with the national reform programme "Estonia 2020", with the Estonian national strategy for sustainable development, "Sustainable Estonia 21", and with the fulfilment of the education-related goals of the "National Security Concept of the Republic of Estonia". The special role of entrepreneurship (1st goal „Change in the approach to learning“) as well as digital skills (4th goal „A digital focus in lifelong learning“) is explicit mentioned within the strategy. The strategic measure 4.5 „Creating learning opportunities for adults to acquire digital competences“ announces that training institutions will work with various partners to fulfil the objectives of the "Information Society Development Plan 2020". Nevertheless digital skills targeted in this Strategy have a more basic character, e-Leadership skills are not mentioned in any kind as a specific goal.

3 Stakeholder initiatives for the promotion of e-Leadership skills development

3.1 e-Leadership training in the context of SME and entrepreneurship support

The country has an effective national system for entrepreneurship support, in the context of which start-ups and high-growth small companies are provided with entrepreneurship training. While digital business skills play an increasing role here, there are few if any programmes focusing exclusively on e-leadership as defined for the present study. **Enterprise Estonia**, the foundation for promotion of business and regional policy in Estonia, offers financial assistance, cooperation opportunities, counselling and training for entrepreneurs, research institutions, the public and non-profit sectors. Enterprise Estonia provides entrepreneurship skills by funding following programmes:

- **Business mentoring programmes** help SMEs find a personal mentor for developing their business.
- **Regional mentoring clubs** have experienced entrepreneurs from across Estonia sharing their knowledge.
- The **Business Incubator** is designed as a place to start an innovative, growth-oriented business.
- **Base training for a start-up entrepreneur** – base knowledge for starting one's own business. A business plan is compiled in the course of a 7-day training programme. The offer targets starting entrepreneurs with no prior business experience as well as entrepreneurs who have just started their business and lack experience. The trainer changes every year, in 2012 for example it was carried out by the **Estonian Entrepreneurship University of Applied Sciences**. Trainings are on offer across the country. Co-funding comes from the European Social Fund.

Enterprise Estonia provides both **start-up grants** (for investments related to starting a business) and **development grants** (for developing or growing an exporting start-up company). From 2010 to 2013, it ran a funding programme on "Development of knowledge and skills"² which offered subsidies to young companies wishing to invest in the development of their management and professional knowledge and skills. The subsidy was available for the purchase of development and training services lasting up to 12 months in the form of: professional in-service training, including general and specialised training; proficiency testing; participation in conferences taking place outside of Estonia; up to 6-month international professional placement; and joint visit to a foreign fair.

The Estonian government initiated **Start-up Estonia**³ in late 2011, a programme for the promotion of business start-ups in high-growth areas with a strong role of ICT. Its objective is to help local students and researchers develop a business idea in the area of ICT, using a network of international mentors who share their knowledge with local entrepreneurs, as well as workshops, open lectures and networking events. Currently two programmes are being developed, the Founder Institute, which seeks to help wage earners start their own business; and Entrepreneur 1st, which focuses on measures targeting students.

A cooperation program with Finland, **StartSmart**⁴ was a programme comprising a wide variety of different activities, all of which designed to target young entrepreneurial minded people in both countries. Between May 2011 and December 2013, StartSmart organized about a dozen different

² <http://www.eas.ee/en/for-the-entrepreneur/development-of-the-company/development-of-knowledge-and-skills>

³ <http://www.eas.ee/et/alustavale-ettevotjale/eas-i-lahendus-ja-toetusvoimalused/start-up-eesti/ueldist>

⁴ <http://www.start-smart.me/en/about-us>; <http://www.eas.ee/et/ettevotjale/innovatsioon/startsmart>

thematic and practical workshops, conferences and other type of events to support the birth of new, innovative and internationally competitive companies. Five organisations stood behind Start Smart!, namely the School of Economics Small Business Centre of Aalto University in Finland; BDA Consulting OÜ; Enterprise Estonia; AS Technopolis Ülemiste; and Estonian Development Fund as the lead partner of the project consortium in Estonia. The programme was funded partly by the EU Structural Funds via the Central Baltic Interreg IV A programme.

To a limited extent, e-leadership skills can be acquired in programmes offered by start-up accelerators, business incubators, networks of entrepreneurs and the like. Examples include:

- **Estonian Start-up Leaders Club⁵**, which was formed by a group of leaders of Ambient Sound Investment portfolio companies. They participated in a 4-module start-up leaders training program in autumn 2008. After the training programme was finished, participants wanted to continue sharing their experiences and getting advice from people working on similar early stage start-ups, for which reason they established the Club and invited other start-ups to join. The four main goals of the Club are: Build stronger relationships among professional Estonian start-up entrepreneurs; provide opportunities for members to meet face to face in a social setting; encourage direct communication, cooperation, knowledge sharing; and development of a culture of professional start-up entrepreneurs in Estonia. Six of the Club's members set up **Garage48⁶** in spring 2010 in order to self-organise a series of international, low-budget but high-value and fun start-up events. At the centre of each event, teams are challenged to implement a working service or prototype within the course of 48 hours. Garage48 events have proven to be effective for showcasing innovative ideas for web and mobile projects and more generally for promoting a culture of entrepreneurship in Estonia and beyond. In terms of skill acquisition, Garage48 teaches entrepreneurs to collaborate on joint projects with very limited time resources.
- **GameFounders**, a start-up accelerator focusing on the computer gaming industry in Estonia. The Game Accelerator is open to applicants from all over the world under the condition that development teams move to Estonia for the programme. It provides mentoring sessions, networking with other teams, seminars, workshops, one-to-one consultation etc. Start-ups have access to the competence of 60+ gaming veterans, CEOs, CFOs and developers and are eligible for various partnership deals from the day they are accepted to the accelerator. In terms of investment support, GameFounders has a network of business angels and venture capital providers interested in gaming start-ups, giving start-ups the opportunity to practice and present to international investors e.g. at so-called Demo Days held in Tallinn, Helsinki, London and San Francisco.
- **Start-up Wise Guys BusinessTech⁷**, a mentorship-led accelerator program for early stage start-ups that provides seed capital, office space and a range of area-specific mentors. Startup Wise Guys has a speciality in payments, banking and security, reflecting expertise in the Estonian business landscape. Start-up Wise Guys' BusinessTech accelerator is promoted as the first B2B-focused accelerator in Europe. Each founder undergoes a 3+1 months programme and is provided with €5,000 (up to a maximum of three founders per startup) seed capital. Startup Wise Guys culminates in an Investor Day both in Estonia and London where the teams get to present to venture capitalists and angel investors.
- **Tehnopol Start-up Incubator⁸**, set up by Tallinn University of Technology, Enterprise Estonia, the Ministry of Economic Affairs and Communication and the City of Tallinn, focuses on high-tech based business ideas and seeks to help new companies develop their business model and

⁵ <http://www.startupleadersclub.com/>

⁶ <http://garage48.org/>

⁷ <http://startupwiseguys.com/>

⁸ <http://www.tehnopol.ee/en/startup/startup-incubator>

marketing strategy. The Incubator provides networking, mentors and coaches, cooperation with other teams and companies, office facilities, access to a wide network of investors and "business boosting events".

- **ESTVCA**, the Estonian Private Equity & Venture Capital Association seeks to develop the Estonian private equity and venture capital industry and to enhance the culture of ambitious and entrepreneurial thinking in the country. This is achieved by representing the PE&VC industry in local and international relations, coordinating and encouraging collaboration between businesses and business angels, developing best practices, standards and working ethics, participating in the Estonian legislative process, collecting and analysing statistics and other related information about private equity and venture capital in Estonia, sharing information and experiences among EstVCA members and industry participants, organizing training seminars, cooperating with relevant research and educational institutions, trade associations, policy makers and other industry specific affiliates and state authorities. Start-up related activities include: encouraging and improving entrepreneurship education in Estonia, supporting business incubators development and financing, introducing the region to investors and start-up entrepreneurs, supporting the establishment of business angel syndicated funds.

3.2 Initiatives within the established education system

Modernisation of Estonia's established education system is continuing, with an increasing emphasis being placed on boosting provision of skills at the intersection of business management and ICT. The most far-reaching initiatives in this respect are the IT Academy Program and the Estonian Higher Education ICT and R&D Activities State Programme 2011-2015 (see below). Tallinn University of Technology has set up a unit which deals with commercialisation of research findings through creation of business start-ups, in the context of which training in digital entrepreneurship is being provided. Among stakeholders, the **Information Technology Foundation for Education (HITSA)**⁹ is of special relevance for the development of e-leadership education and training. HITSA is the founder and managing body of the **Estonian Information Technology College (IT College)**, an institution of applied higher education, which provides IT education by means of four curricula (on administration of IT systems; development of IT systems; analysis of IT systems; technical communication). It organises in-service training courses for institutions and rents premises for different conferences, training sessions and other events pertaining to digital entrepreneurship and organising collaboration between highly educated and experienced specialists of Estonian ICT industry, third sector and academic world.

The **IT Academy Program**¹⁰ is a joint initiative by the Estonian Information Technology Foundation (EITF), the universities and the IT industry sector with the goal of providing education that will fill the requirement of growing IT labour market and raise Estonia's IT education competitiveness to international standards. This programme is supporting digital entrepreneurship by providing qualified specialists and adapting curriculums to today's requirements by increasing their effectiveness, eliminating redundancy and including necessary interdisciplinary skills. The Programme is funded by Ministry of Education, while Skype Company contributes funding as well as marketing expertise. The IT Academy is to boost cooperation and brand-building with the goal to increase the quality of ICT education and to promote ICT course programmes on offer from Estonia's higher education system. IT Academy has the objective to:

- boost attractiveness, quality and outcomes of higher education on ICT (in terms of success of graduates on the labour market of ICT studies);
- result in more and better qualified ICT professionals entering the country's labour market;

⁹ <http://www.hitsa.ee/>

¹⁰ <http://www.hitsa.ee/haridus/korgharidus/ita>

- boost IT-based entrepreneurship;
- strengthen recognition of Estonia as a destination country for IT studies; boost the country's output in terms of international level academic and research expertise.

The total annual budget of the initiative is € 1.5 million (2012), to be increased in subsequent years. Both the Estonia 2020 and the Information Society Strategy 2020 pledge that support for the IT Academy Program will continue in the coming years.

A related programme is the **ProgeTiger** Programme which was launched in Estonia in 2012 by Tiger Leap Foundation. The Tiger Leap Foundation is now a part of HITSA. Focused on primary school only in the beginning, ProgeTiger Programme is now aimed at preschool, primary and vocational education in effort to integrate technology education into curriculum, offering teachers educational resources and training opportunities, financially supporting kindergartens and schools in acquiring different programmable devices. Their activities include among others organising student contest and competitions as well as Information services, promotions, conferences and seminars for target groups like teachers and heads of schools.

The **ICT Program (Estonian Higher Education ICT and R&D Activities State Programme 2011-2015)** is a cooperation programme between universities, the state and the ICT sector in order to improve the quality of education in IT and further develop future cooperation. This is done by improving IT education quality improvement, participation in international collaboration projects and supporting applied-level R&D activities.

Tallinn University of Technology has set up the **Innovation and Business Centre MEKTORY¹¹** for commercialisation of research findings by boosting entrepreneurship. It seeks to bring together scientists, students and entrepreneurs in order to solve practical product development problems and generate new intelligent ideas in three main areas: design and product development; development of business models; and mobile services and media. The broader aims are to tie theoretical studies at the university with the practical side to the maximum possible extent, prepare better-trained engineers with an experience of cooperation with companies, and to encourage students' start-up companies to move forward. MEKTORY offers interdisciplinary courses which have direct relevance for ICT-driven entrepreneurs.

3.3 Initiatives from the business community

Industry initiatives with relevance to the e-leadership issue include the following:

- **E-Estonia ICT Cluster:** The cluster comprises 26 Estonian companies and seeks to promote cooperation among ICT companies and other economic branches in order to boost development of new products and solutions. It contributes to development of ICT curricula and organises training measures such as seminars, workshops and think tanks jointly with other economic branches.
- **Estonian Association of Information Technology and Telecommunications (ITL)** is the country's ICT sector association. Activities include promotion of higher and vocational education with the objective to boost the quality and quantity of ICT trained professionals available on the labour market. According to the **ITL Vision for an Estonian Information Society¹²**, objectives for year 2020 include doubling the number of specialists with ICT competence from 17,000 to 34,000 by increasing number of graduates and improving quality of education.

¹¹ <http://www.ttu.ee/projects/mektory-eng/>

¹² <https://www.itl.ee/?dl=1207>; www.itl.ee/static/files/9.ITL%20Activity%20Plan%202013-2015.pdf

4 Assessment of policies and stakeholder initiatives on development of skills in e-leadership and digital entrepreneurship

Exhibit 1: High-level assessment of policies and stakeholder initiatives on development of skills in e-leadership and digital entrepreneurship

No / Type	Title of policy / initiative	Main stakeholder(s)	Stakeholders from:					Assessment:				
			Government	Business	Unions/ NGOs	Education	MSP fit (0-2)	Target fit (0-2)	Policy fit (0-2)	Scope / Continuity (0-2)	Maturity (0-2)	
Policy 1	Knowledge-based Estonia: Estonian Research and Development and Innovation Strategy 2014-2020 (2014-)	Ministry of Education and Research, Research and Development Council (RDC)	---	---	---	---	---	0-1	---	2	1	
Policy 2	Estonian Information Society Strategy: Digital Agenda 2020 (2013-)	Ministry of Economic Affairs and Communications	---	---	---	---	---	1	---	2	1	
Policy 3	Estonian Entrepreneurship Growth Strategy 2014–2020 (2013-)	Ministry of Economic Affairs and Communications	---	---	---	---	---	1	---	2	1	
Initiative 1	Start-up Estonia (2011-)	Enterprise Estonia (until 2013); Estonian Development Fund (since 2014)	✓	✓	✓	✓	1	1	2	2	2	
Initiative 2	StartSmart (2007-2013)	BDA Consulting OÜ, Enterprise Estonia, AS Technopolis Ülemiste, Estonian Development Fund, School of Economics Small Business Centre of Aalto University (FI)	✓	✓		✓	1	1	2	0	2	
Initiative 3	IT Academy Programme	Estonian Technology Foundation (EITF)	✓	✓	✓	✓	2	1	1-2	2	2	
Initiative 4	Tehnopool Start up Incubator	Enterprise Estonia, Tallinn University of Technology, Estonian Ministry of Economic Affairs and Communications, City of Tallinn	✓	✓		✓	2	1	1	2	2	
Initiative 5	Garage48 (2010-)	Estonian Start-up Leaders Club	✓	✓			1	1	1	2	2	

No / Type	Title of policy / initiative	Main stakeholder(s)	Stakeholders from:				Assessment:				
			Government	Business	Unions/ NGOs	Education	MSP fit (0-2)	Target fit (0-2)	Policy fit (0-2)	Scope / Continuity (0-2)	Maturity (0-2)
Initiative 6	Game Accelerator (2012-)	GameFounders, with support by Enterprise Estonia and a network of business sector sponsors	✓	✓		✓	1	1	1	1	1
Initiative 7	BusinessTech Accelerator (2010-)	Start up Wise Guys		✓	✓		1	1	1	1	2
Initiative 8	Innovation and Business Centre MEKTORY	Tallinn University of Technology	✓	✓	✓	✓	1	1	1	1	1

5 Best practice policy and stakeholder initiatives

From the policies and initiatives mentioned above, the following have been selected as candidates for best practice.

5.1 IT Academy Programme

The IT Academy Programme is a cooperation programme run by the Republic of Estonia, the country's main universities (University of Tartu and Tallinn University of Technology) and the ICT industry for securing the necessary labour force for the sector and for creating preconditions for Estonia's growth through ICT. Preparatory work started in 2009, while most concrete actions commenced in 2012.

The overall objective is to increase the number of ICT specialists entering the labour market and improve their skills as well as increase international competitiveness of the Estonian ICT curricula. More specific aims include:

- boosting attractiveness quality and outcomes (in terms of success of graduates on the labour market of ICT studies);
- achieving more and better qualified ICT professionals entering the country's labour market;
- boosting ICT-based entrepreneurship; strengthening recognition of Estonia as a destination country for IT studies; and
- fostering the country's output in terms of international level academic and research expertise.

The IT Academy has an annual budget of EUR 2.8 million in 2014, up from 1.5 million in 2012. For 2015, the planned budget is 2.7 million (to be confirmed). The initiative is sponsored by Skype to the amount of € 100,000 per year.

Within the context of the IT Academy, six new course programmes have been established at University of Tartu and Tallinn University of Technology. Main outcomes so far include a substantial increase in the number of students participating in ICT curricula at a time when the total number of students has gone down. In addition, there has been an increase in the number of lecturers, including teaching staff from abroad, whereby the ratio of students to lecturers has improved. This also applies to the number of assistant staff, leaving professors to focus on their core tasks and resulting in better outcomes.

An independent evaluation has not yet taken place, but anecdotal evidence suggests that students have started to value the ICT curricula more highly. Insiders identify some challenges as well, e.g. insufficient visibility and low media attention, which makes it more difficult to promote the message that ICT education is of major benefit not only for individuals but for the general public: For example, the contribution of each employee in the ICT industry to total value-added is twice as high as the Estonian average. There are also some signs of a backlash in general perceptions about ICT, as some people feel that too much emphasis is placed on ICT education.

The main lessons learned, as perceived by national experts, is that the IT Academy as a support programme has proven to be an excellent method to bring businesses and universities in closer contact with each other, to the benefit of the whole country. Universities in Estonia still tend not to understand that it is not the state itself who "consumes" their "product" (students), but that it is businesses that as employers create demand for the skills of graduates; therefore it is very important to invest in effective interaction between universities, businesses and the government to be able to meet the needs of all stakeholders.

5.2 Start-up Estonia

The Estonian government initiated **Start-up Estonia** in late 2011, a programme for the promotion of business start-ups in high-growth areas with a strong role of ICT. Start-up Estonia is an initiative to support start-ups in digital entrepreneurship by helping local students and researchers to develop business incentive in the area of ICT. Start-up Estonia brings mentors from around the world in order to share their knowledge with local entrepreneurs, organises workshops, open lectures and networking events to help collaboration and mutually beneficial information sharing. As part of the initiative, study trips to Silicon Valley and annual international start-up conference Latitude59 are supported. The programme is managed by the Estonian Development Fund since 2014, when it took over from Enterprise Estonia. In the new funding programming period (2014-2020) the activities of Start-up Estonia are directly linked to the development of e-leadership skills and digital entrepreneurship. The program focuses on the development of technology based start-up entrepreneurship in the smart specialisation areas. First, the focus is on the people and accelerating the ideas (e.g. idea generation, idea validation, hackathon). In this context two programmes are currently being developed, the **Founder Institute**, which seeks to help wage earners start their own business; and **Entrepreneur 1st**, which focuses on measures targeting students. Another emphasis is on providing better financial support to start-up businesses in the form of early stage seed capital. In addition, the program contributes to promoting Estonia as a country of destination for start-up businesses and to the development of an investor network.

Methodology

European e-Leadership Scoreboard

The scoreboard attempts to offer an approach to monitoring and assessing issues related to e-leadership skills development, such as: education offers, workforce potential, exploitation opportunities, and enabling policies or other driving mechanisms. It compares at Member State level the e-leadership “performance” of EU28 Member states across several building blocks, thereby allowing for comparisons on relative strengths and weaknesses of e-leadership ecosystems between countries, with the major goal of informing and enabling policy discussions at national and EU level.

The e-leadership scoreboard is an evolving model to be further refined through input from academic / experts debates and feedback from other interested parties. It comprises a series of indicators using data from both primary and secondary sources. It is based on a straightforward yet comprehensive framework for measuring determinants of demand and supply for e-leadership skills in each country. Conceptually, the e-leadership scoreboard comprises four levels, **28 indicators; 8 building blocks; 4 dimensions**, which can be aggregated to receive an overall e-leadership **Index (eLI)**.

The overall e-leadership performance in each of the country has been summarized into a scoreboard, and further on into a composite indicator (e-leadership index). These raised a number of challenges related to the quality of the data selected and to their combination into a single indicator. A number of steps were taken to assure the quality of the data and the reliability of the e-leadership index. The steps followed are explained in more details below:

Step 1: Identifying and addressing outliers

Mean and standard deviations have been calculated for all indicators among all countries included in the scoreboard. Outliers have been identified as the absolute z-values larger than 3. Relative to the case, the values distorting the variable distribution (positive/negative outliers) have been replaced by maximum/minimum values observed in each single indicator. Beforehand, some indicators have been standardized using population data in order to avoid any country-size effects in the dataset sample.

Step 2: Setting reference year

A reference year is set depending on the data availability of each indicator for each of the countries considered. Overall, for most of the indicators the reference year is lagging 1-3 years behind the timing the e-leadership scoreboard refers to. In this case, the reference year for most of the indicators of the 2014 e-leadership scoreboard will be lying between years 2011 to 2013.

Step 3: Treatment of missing data

When dealing with the missing values, we distinguish among two different cases which influence data imputation procedure:

- **Missing at random:** If data is not available for a year-in-between, we replace data using the value for the previous year / latest year available.
- **Missing completely:** For countries which data is completely missing for the entire time series, no imputation is effort carried out. In these cases the indicator is left empty, marked as not available ('n/a'), and not considered in the calculation of the county scores.

Table 1: e-Leadership scoreboard indicators

Indicator	Definition and scope	Latest data available	Source
e-leadership skilling			
Number of Master's or Exec. Ed level programmes with a mix of ICT and business	Definition: combination programmes that have as target group specialist or junior / middle management are professional-oriented and have a mix of business and IT. Either at regular consecutive MSc level, or are aimed at specialist subjects only (e.g. new media, marketing, logistics, communications, e-health etc. Measure: per 100,000 population aged 20-59	2013	empirica
E-leadership candidate programmes	Definition: E-leadership candidate programmes - programmes that are clearly aimed at experienced professionals with leadership roles, which usually already expect a high level of IT skills and significant business experience. Measure: per 100,000 of workforce with potential e-leadership skills	2014	empirica
Enterprises that provided training to ICT/IT specialists to develop/upgrade their ICT skills	Definition: Enterprises who provided training to develop/upgrade ICT skills of their personnel: for ICT/IT specialists (NACE Rev. 2). Measure: % of enterprises	2012	Eurostat Information society statistics Code: isoc_ske_ittn2
Quality of management schools	Definition: In your country, how would you assess the quality of business schools Measure: [1 = extremely poor—among the worst in the world; 7 = excellent—among the 2012–13 weighted average	2013	World Economic Forum, Executive Opinion Survey
e-leadership skilled professionals			
Line managers	Definition: ISCO-08 (1211, 1213, 1219, 1221, 1222, 1223) Measure: as % of total workforce	2013	LFS
ICT managers, architects and analysts	Definition: ISCO-08 (1330, 2421, 2511) Measure: as % of total workforce	2013	LFS
e-leadership pipeline			
e-Leadership pipeline 1: ICT practitioners - professional level	Definition: ISCO-08 (2152, 2153, 5356, 2434, 5212, 2513, 2514, 2519, 2512, 2522, 2523, 2529) Measure: as % of total workforce	2013	LFS
e-Leadership pipeline 2-1: ICT graduates	Definition: Count of first degrees in ISCED 5A and first qualifications in 5B. The number of students entering the labour force in a given year does not equal but is approximated by this number of graduates, as many will go on to second or further degrees (master, PhD). Measure: per 1,000 population aged 20-24	2012	Eurostat Code: [educ_grad5]
e-Leadership pipeline 2-2: Business administration graduates	Definition: Count of first degrees in ISCED 5A and first qualifications in 5B in business and administration. Measure: per 1000 population aged 20-24	2012	Eurostat Code: [educ_grad5]
Business environment			
High growth enterprises in ICT sector	Definition: High growth enterprises (growth by 10% or more) and related employment by NACE Rev. 2 sectors: Information and communication (I). Measure: Number of high growth enterprises measured in employment (growth by 10% or more)	2012	Eurostat Code: [bd_9pm_r2]
High growth enterprises in ICT intensive sectors	Definition: High growth enterprises (growth by 10% or more) and related employment by NACE Rev. 2 sectors: Manufacture of computer, electronic and optical products (C26), Manufacture of electrical equipment (C27), Manufacture of machinery and equipment n.e.c. (C28), Manufacture of motor vehicles, trailers and semi-trailers (C29), Manufacture of other transport equipment (C30), Professional, scientific and technical activities (M). Measure: Number of high growth enterprises measured in employment (growth by 10% or more)	2012	Eurostat Code: [bd_9pm_r2]
Employment in ICT sector	Definition: Number of persons employed in the following NACE Rev. 2 sectors: Manufacture of computer, electronic and optical products (C26), Information and communication (I). Measure: as % of total employment	2011	Eurostat
Employment in ICT intensive sectors	Definition: Number of persons employed in the following NACE Rev. 2 sectors: Manufacture of electrical equipment (C27), Manufacture of machinery and equipment n.e.c. (C28), Manufacture of motor vehicles, trailers and semi-trailers (C29), Manufacture of other transport equipment (C30), Professional, scientific and technical activities (M). Measure: as % of total employment	2011	Eurostat
Enterprises that employed ICT/IT specialists	Definition: Enterprises that employed ICT/IT specialists (NACE Rev. 2) Measure: % of enterprises	2012	Eurostat Code: [isoc_ske_itspen2]
Innovation opportunities			
State of cluster development	Definition: In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related specialized institutions in a particular field)? Measure: [1 = nonexistent; 7 = widespread in many fields] 2012–13 weighted average	2013	World Economic Forum, Executive Opinion Survey
Capacity for innovation	Definition: In your country, to what extent do companies have the capacity to innovate? Measure: [1 = not at all; 7 = to a great extent]	2013	World Economic Forum, Executive Opinion Survey
Firm-level technology absorption	Definition: In your country, to what extent do businesses adopt new technology? Measure: [1 = not at all; 7 = adopt extensively] 2012–13 weighted average	2013	World Economic Forum, Executive Opinion Survey
Impact of ICT on new services and products	Definition: To what extent are ICTs creating new business models, services and products in your country? Measure: [1 = not at all; 7 = a significant extent] 2011–2012 weighted average	2012	World Economic Forum, Executive Opinion Survey
Technology trends			
Availability of latest technologies	Definition: In your country, to what extent are the latest technologies available? Measure: [1 = not available at all; 7 = widely available] 2012–13 weighted average	2013	World Economic Forum, Executive Opinion Survey
Enterprises using social networks	Definition: Use social networks (e.g. Facebook, LinkedIn, Xing, Viadeo, Yammer, etc.) Measure: % of enterprises	2013	Eurostat Code: [isoc_cismt]
Enterprises using RFID technologies	Definition: Enterprises using Radio Frequency Identification (RFID) technologies Measure: % of enterprises	2011	Eurostat Code: [isoc_ci_cd_en2]
National policy and stakeholder initiatives			
ICT Practitioner Skills	Definition: Level of national policy and stakeholder activity on ICT Practitioner Skills Measure: 1 - 5 (1 = "No relevant policy or stake-holder activities of significant scope and size have been identified."; 5 = "A master strategy is in place.)	2013	empirica
e-Leadership education and training	Definition: Level of national policy and stakeholder activity on e-Leadership education and training Measure: 1 - 5 (1 = "No relevant policy or stake-holder activities of significant scope and size have been identified."; 5 = "A master strategy is in place.)	2014	empirica
Skills for digital entrepreneurship	Definition: Level of national policy and stakeholder activity on Skills for digital entrepreneurship Measure: 1 - 5 (1 = "No relevant policy or stake-holder activities of significant scope and size have been identified."; 5 = "A master strategy is in place.)	2014	empirica

Step 4: Calculating re-scaled scores

Min-max normalisation method was adopted to adjust for differences in terms of units of measurement and ranges of variation. All 28 variables have been normalised into the [0-10] range, with higher scores representing better performance for the indicators.

The following normalisation formula has been applied:

$$X_{i,0 \text{ to } 10} = 10 \times \frac{(X_i - X_{\text{Min}})}{(X_{\text{Max}} - X_{\text{Min}})}$$

Where:

X_i = country score

X_{Min} = sample minimum

X_{Max} = sample maximum

$X_{i,0 \text{ to } 10}$ = the data point i normalized between 0 and 10

Step 5: Calculating composite e-leadership index

The e-leadership Index for each country is calculated as a weighted average of the rescaled scores for every indicator included in the scoreboard. The weighting approach used distributes different weights to each of the building blocks, based on the results obtained from a regression analysis which assesses relationships between each building block indicators' (independent variable) and estimated number of e-leaders for each 28 Member States (dependent variable). The rationale behind this analysis is to explore and assess relationships between indicators' performance and potential presence of e-Leaders.

Identification of policies and stakeholder initiatives on e-leadership skills

To gather information on and evaluate the current e-leadership skills policy and initiative landscape and try to assess the impact of relevant policies at EU and national level, a significant amount of information needed to be systematically collected. The challenge has not only been that the information owners are heterogeneous (including actors in the public sector, the private sector, e.g. the IT industry, and educational organisations), but also the geographic scope of the exercise, as the study focused on activities in all 28 Member States (and major regions, if relevant). The collected information included, in particular, factual information about ongoing and completed activities at the European level and in EU Member States (e.g. information about the types of initiatives, the stakeholders involved and the governance model applied), as well as views of stakeholders and experts that have been involved in such activities regarding the outcome of these activities.

Our activities consisted mainly of:

- a survey of relevant **national policies** in the e-leadership skills domain, and
- a survey of **initiatives and multi-stakeholder partnerships (MSPs)** at Member State level in this domain, with the focus as before.

The data was collected with the support, where found appropriate, of a network of national correspondents covering all 28 Member States of the EU.

Information gathering using templates where appropriate is divided into three steps.

In a **first** step it focused on the **general policy context** in the different countries. The aim has been to give a brief overview of the overall structure of the policy system and programmes and the key stakeholders active in this area. In this section, national correspondents were guided to refer to and

mention the policy programmes of relevance for e-leadership skills and to provide an overview of how these are embedded and integrated in the overall policy context.

The work built on already existing literature and studies available from previous projects, statistical sources and the proposers' expertise and experiences gained in the precursor and previous projects and service contracts. The analysis was enhanced by most recent literature and studies.

In a **second** step, more in-depth data has been gathered on the **major policies and initiatives** targeting creation of e-skills and e-leadership skills which had been identified in the previous step. The template was brief, with the following points to be addressed:

- Name of policy, programme, initiative
- Overall objectives
- Specific objectives
- Targets
- Main characteristics
- Policy evaluation: Monitoring and measurement system in place
- Results achieved (versus objectives and targets)

The output of this activity included descriptions of the respective policies and initiatives on the basis of a standardised **template**, consisting of about 5 pages of text in tabular format and a preliminary assessment with regard to some benchmarking indicators (see below for a description of the benchmarking approach).

At an early stage of the project (Phase I) empirica developed a data gathering guide and template for use by national correspondents to gather the relevant information. This was followed by contacting national correspondents and providing them with a Guide / Toolkit containing background information, guidelines and instructions for how to conduct the research, and the data capture instruments (description templates and questionnaires, as applicable). National correspondents in each Member State were asked to identify key actors and experts in the fields of e-skills and e-leadership skills and to interview them, as well as to undertake desk research.

In order to avoid work duplication and to achieve best value for money, national correspondents were supplied with **pre-filled data templates** wherever available based on the instruments used for precursor studies, which they were then asked to validate, update and complement as appropriate.

Benchmarking and assessment of policies and stakeholder initiatives on e-leadership skills

Indices for Member States' level of policy activity

National policy activity was explored through an investigation on national policy and stakeholder initiatives that have a bearing on skills development in the e-leadership and digital entrepreneurship area. Findings are summarised in the form of two indices for policies & initiatives addressing e-leadership skills of SMEs and skills for digital entrepreneurship, respectively. Index values have not been mechanistically derived using checklists but rather through a qualitative assessment of the significance and importance of each policy and activity.

Index values are to be interpreted as follows:

Table 2: Scoring format for assessment of national policy and stakeholder activities

Score	National policy and stakeholder initiatives on e-Leadership Skills for SMEs	National policy and stakeholder initiatives on Skills for Digital Entrepreneurship
●	No relevant policy or stakeholder activities of significant scope and size have been identified. Policy debate is non-existent or sketchy.	No relevant policy or stakeholder activities of significant scope and size have been identified. Policy debate is non-existent or sketchy.
●●	There are little policy or stakeholder activities which <i>explicitly</i> deal with e-leadership skills, but related topics have entered the policy debate. Measures are in place, e.g. training of SMEs in strategic use of ICT for innovation. Education providers show clear signs of awareness.	There are little policy or stakeholder activities which <i>explicitly</i> deal with skills for digital entrepreneurship, but related topics have entered the policy debate, e.g. in the context of efforts to boost entrepreneurial skills and attitudes. Education providers show clear signs of awareness.
●●●	Some major policy and stakeholder activities, but coordination/integration, scope and sustainability are limited. Policy debate is well developed but still limited to insiders rather than the main target groups. Education providers offer relevant courses/programmes.	Some major policy and stakeholder activities, but coordination/integration, scope and sustainability are limited. Policy debate is well developed but still limited to insiders rather than the main target groups. Education providers offer relevant courses/programmes.
●●●●	Training for e-leadership is fully embedded in policy strategies (e.g. e-skills or SME strategies) and action plans are in place. The policy debate is well developed and involves all key target groups. SME demand for training courses is met by supply. Some shortcomings e.g. in terms of sustainability, monitoring, scalability, coverage.	Training for digital entrepreneurship is fully embedded in policy strategies on entrepreneurship, and action plans are in place. The policy debate is well developed and involves all key target groups. Entrepreneur demand for training courses is met by supply. Some shortcomings e.g. in terms of sustainability, monitoring, scalability, coverage.
●●●●●	A master strategy is in place and there are not only various relevant policies and stakeholder initiatives, but these are also well integrated at national and sectoral level. Buy-in from all relevant stakeholders has been obtained.	A master strategy is in place and there are not only various relevant policies and stakeholder initiatives, but these are also well integrated at national and sectoral level. Buy-in from all relevant stakeholders has been obtained.

Preliminary results, as reproduced in the present document, will be validated through a major online survey using a sample of >300 stakeholder representatives and experts covering all 28 EU Member States.

Methodology for Benchmarking policies and initiatives

For identification of existing policies and initiatives that are of relevance to the e-leadership issue we have made use of a **SWOT analysis** approach (strengths – weaknesses – opportunities – threats). A SWOT analysis combines the assessment of *external developments* that cannot be directly influenced by the organisation in focus (e.g. the overall market development) with an analysis of its *internal specific situation* (e.g. its capabilities, product quality and price, market position). Factors specific to the firm are classified as strengths (S) or weaknesses (W), depending on how the situation is in comparison to key competitors with regard to the selected evaluation criteria. *External* developments (e.g. market trends) are then matched with the organisation's specific strengths and weaknesses, which leads to conclusions on opportunities (O) or threats (T). A SWOT analysis helps organisations allocating their resources and capabilities to the competitive environment in which they operate. As such, the instrument is often used for (longer-term) strategy formulation.

The **unit of observation** in the present study is **policies and stakeholder initiatives**. The methodology for benchmarking these is described below. The analysis of strengths and weaknesses was conducted in a multi-step process for which various sets of criteria are being applied. In order to arrive at a shortlist of candidates from the initial total set of up-and-running policies and stakeholder initiatives identified by the National Correspondents, an evaluation scheme based on the following criteria was used:

Table 3: Criteria for selecting outstanding policies and stakeholder initiatives for shortlisting

Selection criteria	Evaluation scheme	
Partnership approach of the policy or initiative ("MSP fit")	To what extent does the policy or initiative make use of a "multi-stakeholder partnership" approach? Each case is given a score on a scale of 3 values:	
	HIGH (2)	The policy or stakeholder initiative fully complies with the MSP definition, i.e. it engages all main stakeholders that are of relevance for a certain e-leadership skills related issue. The partnership involves all or most of the following: government (at national, regional and/or local level), business, education providers, social partners and possibly the civic sector (e.g. NGOs).
	MEDIUM (1)	The policy or stakeholder initiative has some involvement of several partners from the government, business, social partners and/or education sector, but not all main stakeholders which are of relevance for a certain e-skills related issue are engaged.
	LOW (0)	The policy or stakeholder initiative is initiated and operated mainly by one / only a few partners from only one, at most two sectors (government, business, social partners, education) and it appears that some key stakeholders who are of relevance for the e-skills related issue in question are not involved.
Target and approach of the policy or initiative ("Target fit")	To what extent does the policy or stakeholder initiative target skills development in the e-leadership and digital entrepreneurship area¹³? Each case is given a score on a scale of 3 values:	
	HIGH (2)	The policy or stakeholder initiative has a clear focus on skills development in the e-leadership and/or digital entrepreneurship area
	MEDIUM (1)	The policy or stakeholder initiative addresses skills development in the e-leadership and/or digital entrepreneurship area, but its main focus is more traditional (e.g. on general leadership or entrepreneurship skills).
	LOW (0)	The policy or stakeholder initiative deals with "digital literacy" of the general population or subgroups hereof (e.g. unemployed, disabled people), but does not address ICT practitioner skills and/or e-Leadership skills.
Embeddedness in the general policy context ("Policy fit")	To what extent is the policy or stakeholder initiative embedded in a broader policy context? Each case is given a score on a scale of 3 values:	
	HIGH (2)	The policy or stakeholder initiative is strongly embedded in a relevant national or regional policy context (such as a skills strategy or an innovation action plan).

¹³ Rather than entrepreneurship skills in general, or leadership skills in general

Selection criteria	Evaluation scheme	
	MEDIUM (1)	There are some links of the policy or stakeholder initiative to general skills and innovation related policy programmes.
	LOW (0)	The policy or stakeholder initiative is poorly embedded, i.e. links to general skills and innovation related policy programmes are very limited. It is likely to remain a one-off activity of limited duration.
Size and scope of the policy or initiative ("Scope and continuity")	Are the size and scope of the policy or stakeholder initiative sufficient to make it relevant to national skills development in the e-leadership and digital entrepreneurship field? Each initiative is given a score on a scale of 3 values:	
	HIGH (2)	The policy or stakeholder initiative has a size (in terms of budget, number of stakeholders involved, target group reach, or similar) and scope (e.g. sectors and occupations covered) which makes it highly relevant to related developments in the whole country. Its duration is not limited to a one-off project, but there is (planned to be) a continuity of activities over many years.
	MEDIUM (1)	The policy or stakeholder initiative has a size and scope which means it is of some relevance to related developments in the whole country. Its duration may be limited to a one-off project, but its goals are continued through other means.
	LOW (0)	Size and scope of the policy or stakeholder initiative are a too limited to make it relevant to related developments in the whole country, or its duration is limited to a one-off project without any continuation or follow-on activities.
Level of experience with the policy or initiative ("Maturity")	Has the policy or stakeholder initiative been in operation for long enough to make it possible to assess performance and to learn from its experience? Each case is given a score on a scale of 3 values:	
	HIGH (2)	The policy or stakeholder initiative has achieved a major part of its operational goals already, i.e. it has been in operation for long enough to allow for assessment.
	MEDIUM (1)	The policy or stakeholder initiative has commenced already but is at an early stage of implementation.
	LOW (0)	The policy or stakeholder initiative is still at the planning stage, i.e. no experience is available yet.