

e-SKILLS IN EUROPE

SLOVENIA

COUNTRY REPORT

JANUARY 2014

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1 Overview

Slovenia has seen some progress in the e-skills domain in recent years. Among **positive developments** is the introduction of informatics courses in schools (ordinary schools, high schools, vocational schools) and the rising number of undergraduate programmes with informatics courses. In respect to demand for ICT user skills, the number of employers demanding such skills is clearly rising.

There is also some development in boosting supply of ICT practitioner skills. However, most experts seem to agree that progress should have been faster and more pronounced. Critics point out that the abolishment of both the Government Centre for Informatics and the Ministry of Information Society has resulted in Slovenia falling behind. Key projects such as on e-procurement have not been taken on yet, and too little effort is spent on at least maintaining the status quo, as indicated for instance by the outdated government website. Some experts state that the dismantling of the Government Centre for Informatics and the Ministry of Information Society were indicative of a general erosion of interest in the development of the information society in Slovenia. They point out as an example that there has been little progress in terms of roll-out of e-procurement, were ten years ago Slovenia was among the most advanced countries in Europe.

According to most experts' opinion there is still a shortage of ICT practitioners in the country, although job offers published on the portal of Slovenian Employment Services do not reflect that. It is expected that, as soon as the economic situation improves, demand for ICT practitioners will jump up.

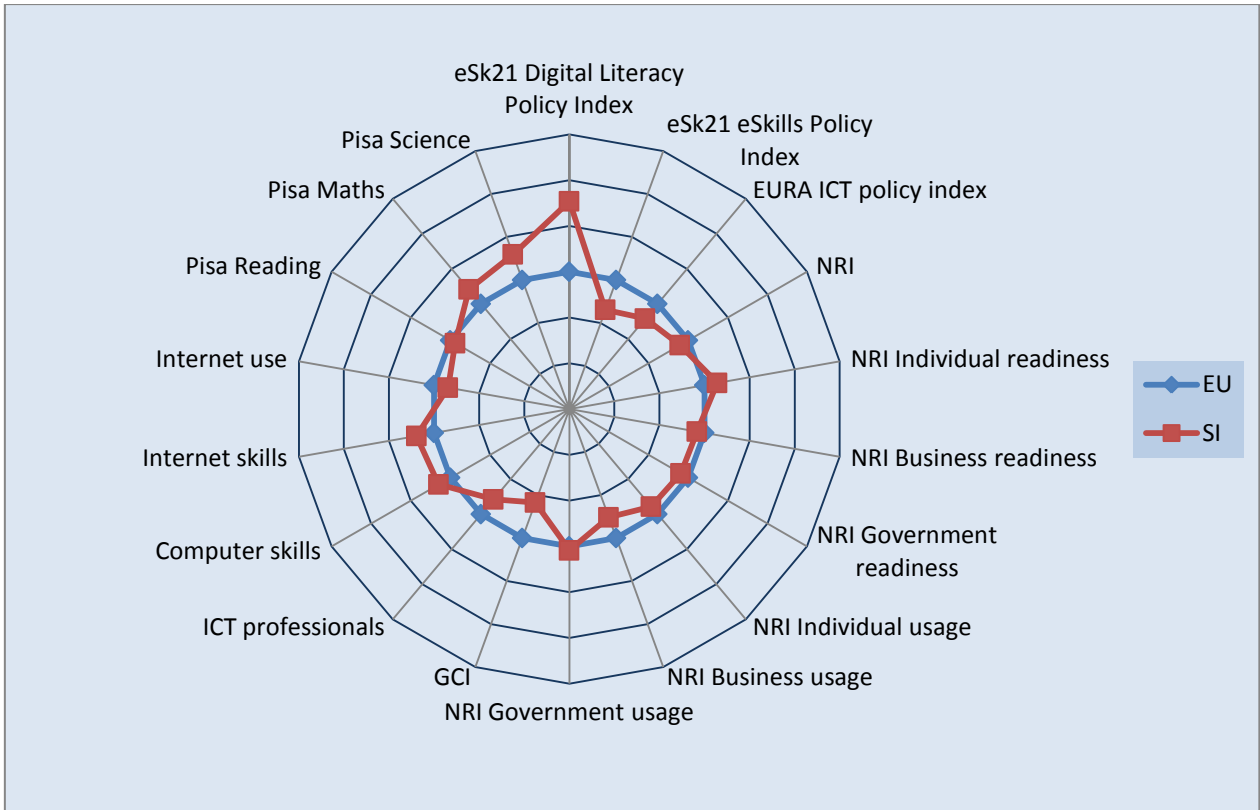
Areas of concern include:

- Lack of ICT skills among teachers and professors;
- Public sector budgets are not sufficient to properly educate and re-train teaching staff;
- Shortage of ICT equipment in general;
- Outdated ICT equipment especially in schools;
- Critics complain that the Slovenian educational system provides students with too much theory and not enough practice.

The **main objective** for the next years is to promote careers in ICT and to achieve higher enrolment rates in high schools and undergraduate programmes for computer sciences. Besides that, it will be necessary to include training in ICT into all other study programmes and to modernise the ICT equipment in all parts of the education system.

2 Indicators on innovation, competitiveness and ICT skills

Slovenia						
	Score 2009/2010	Rank 2009/2010	Score 2011/2012	EU27 Rank 2011/2012	Change (Rank)	Comment
eSkills21 study: 'e-skills' index 2010	1.5	14				Max.: 5.0
eSkills21 study: 'Digital literacy' index 2010	4.5	1				Max.: 9.0
EuRA e-skills index	2.7	19				Max.: 5.0
ICT practitioners in % of total employment 2012			2.86%	16		EU average: 3.43%
Digital literacy skills of the population 2009/11:						
• Individuals with high level of computer skills	28%	10	31%	11	↓	EU average: 28.52%
• Individuals with high level of Internet skills	10%	10	16%	8	↑	EU average: 13.67%
• Individuals using the Internet (last three months)	62%	15	67%	8	↑	EU average: 71.33%
Global Competitiveness Index (GCI) 2010/12	4.6	16	4.3	22	↓	Max.: 5.61 EU median: 4.52
Networked Readiness Index (NRI) 2010/12	4.6	15	4.44	16	↓	Max.: 5.6. EU median: 4.5
• Individual readiness	5.94	16	5.18	11	↑	
• Business readiness	5.02	13	4.45	14	↓	
• Government readiness	4.45	17	4.18	16	↑	
• Individual usage	3.68	15	4.88	14	↑	
• Business usage	4.98	15	3.48	19	↓	
• Government usage	4.45	17	4.23	15	↑	
PISA scores (2009) in:						
• Mathematics	501	7				EU median: 493
• Science	512	6				EU median: 498
• Reading	483	16				EU median: 489

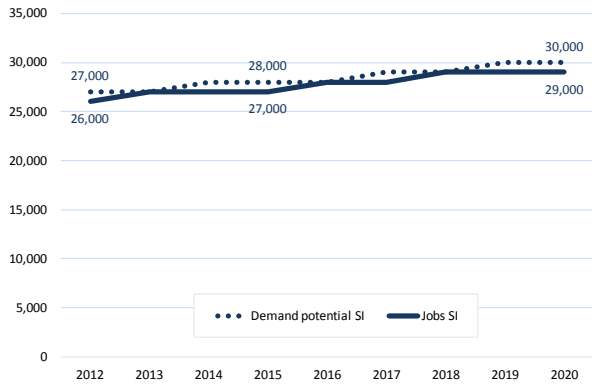


3 E-skills demand and supply forecasts 2012 – 2015 - 2020

Slovenia			
	SI	Rank EU27	EU27
ICT practitioner workforce 2012	26,000	21	7,403,000
ICT practitioner workforce 2012 as percent of total workforce	2.9%	16	3.4%
Assumed excess demand 2012	600	21	274,000
Forecast excess demand 2015	700	20	509,000
Forecast excess demand 2020	900	21	913,000
Forecast ICT practitioner jobs 2015	27,000	21	7,503,000
Forecast ICT practitioner jobs 2020	29,000	21	7,950,000
Workers 2012 - Management, business architecture and analysis level	6,100	21	1,477,000
... as percent of total workforce	0.7%	13	0.7%
Workers 2012 - ICT practitioners, professional level	13,000	21	3,393,000
... as percent of total workforce	1.4%	15	1.6%
Workers 2012 - ICT practitioners, technician and associate level	7,600	22	2,532,000
... as percent of total workforce	0.8%	21	1.2%
Growth core ICT workforce 2001-2010	8.2%	4	3.0%
Growth core ICT workforce 2008-2010	1.7%	16	2.6%
Growth core ICT workforce 2011-2012	-13.9%	25	3.9%
Growth broad ICT workforce 2011-2012	-10.3%	26	1.8%
ISCED 5A/B first degree graduates in Computer Science, 2011	543	23	113,000
... graduates per 1000 population aged 20-24	4.3	6	3.6
... graduates 2011 as percent of 2006 (= peak EU)	270%	1	88%
Vocational training graduates in Computer Science, 2011	620	12	67,000

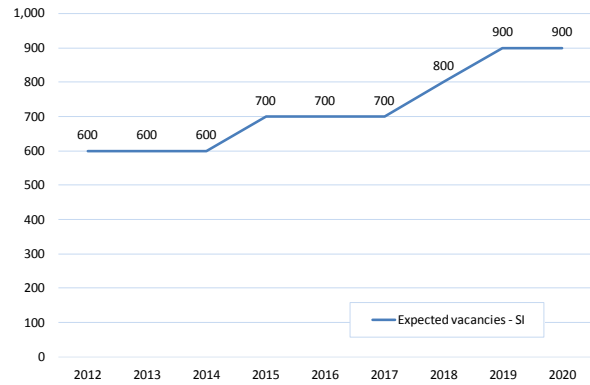
Sources and notes: see annex.

ICT workforce: Demand and Jobs in Slovenia 2012-2020 (Main Forecast Scenario)



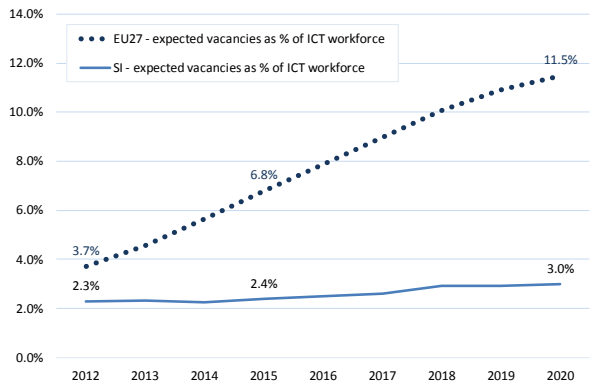
Source: empirica 2013

e-Skills shortage: Potential vacancies in Slovenia 2012-2020 (Main Forecast Scenario)



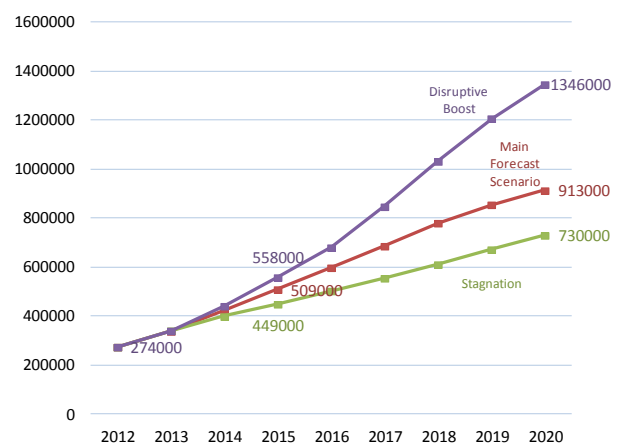
Source: empirica 2013

Potential vacancies as percent of ICT workforce Slovenia 2012-2020 (Main Forecast Scenario)



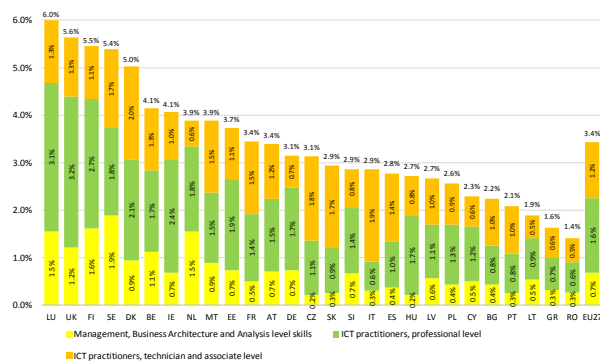
Source: empirica 2013

Potential vacancies in Europe (EU27) by scenario 2012-2020



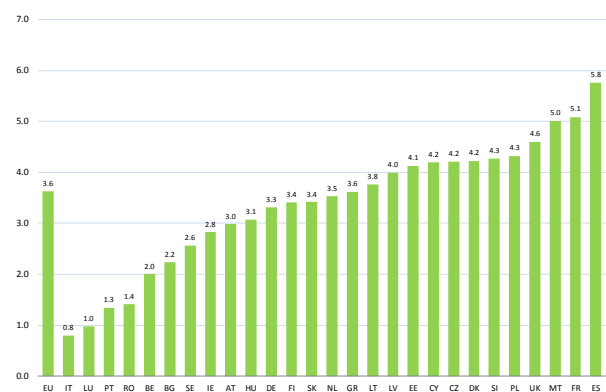
Source: empirica 2013

ICT practitioner workforce as percent of total workforce in EU Member States in 2012



Source: empirica 2013

First degree graduates in Computer Science (ISCED 5A/B) per 1000 population aged 20-24, 2011



Source: empirica 2013

4 Policy and major stakeholders initiatives

The Slovenian Government is firmly committed to raising the level of e-skills in all parts of the country. It had established a **Ministry of Information Society** that had responsibility for the area of ICT infrastructure and online public services. Later the Ministry of the information Society was dismantled as an independent ministry and its responsibilities were transferred to the **Information Society Directorate** at the **Ministry of Education, Science and Sport**.

The Slovenian key policy documents on Information Society are as follows:

- Slovenian National Strategy for 2006-2013
- National Development Programme for 2007-2013,
- National Strategic Reference Framework for 2007-2013.

Based on these policies, different strategies that included individual fields of the information society were prepared:

- e-Health 2010,
- Introducing fixed wireless systems,
- Developing broadband data networks,
- e-Government 2006-2010,
- e-Learning 2006-2010.

The last major policy initiative has been the **Development Strategy for the Information Society in the Republic of Slovenia** (si2010).

After this, no more policies explicitly targeting the information society have been published. Also no formal documents exist about implementation of Digital Agenda for Europe 2020, except for some specific areas, e.g. Strategy for Effective Government Informatics, Strategy for Telemedicine etc.

With some delay, however, the government have assigned a number of actions from the Digital Agenda 2020. Action 58 (Develop a framework to recognise ICT skills) and the Action 59 (Prioritise digital literacy and skills in the 'New skills for jobs' flagship) fall under the Directorate Information Society's responsibility. Unfortunately, the Directorate lacks resources for their implementation.

These circumstances reflect a general crisis in the country in recent years, accompanied with severe budget cuts. As a result, information society issues do not attract much attention, and the issue of e-skills development is not given any priority. While Slovenia in 1990s was among the leading European countries on a number of ICTs indicators (e.g. host density, share of PC among households, ICT usage in schools, online payment system for companies, centralised e-governed service), the situation has worsened towards the end of the 1990s when lack of coordination at national level was holding back development. As a result, performance on ICT indicators gradually got worse to an extent that in latest years, Slovenia performs worse than the EU average. This applies in particular to advancement of online public services and information society policy in more general. On the other hand, levels of general usage of the internet and related activities (e.g. self-learning) are still relatively high, particularly among the younger generations, where Slovenia performs still much above EU average.

The **ruling body** for the development strategy is the **Directorate for the Information Society**, operating under the auspices of the **Ministry of Education, Science and Sport**. The Directorate is responsible for accelerated, harmonised and efficient development of the information society based on knowledge and life-long learning. This is in practice supposed to be reflected in the transfer of knowledge, ICTs and contents to schools and research institutions, public administration and local self-government bodies, the economy and civil society. In its work the Directorate asserts

to cooperate with various organisations, including those in the field of legislation, security and privacy in the e-world, education, monitoring of indicators of the information society development, promotion of software development and its localisation based on an open and free source, scientific and expert meetings, projects bridging the digital divide and others.

The **Ministry of Education, Science and Sport** has, especially in the period 2009-2010, encouraged the implementation of e-content and e-services in the fields of culture, science, technology, health, local administration, business, consumers and environmental protection. The Ministry also directed its activities towards the inclusion of all the citizens in modern social and technological flows, e.g. social groups with worse chances for e-inclusion.

It should be also pointed out that the **Ministry of Justice** published in 2012 the **Strategy of Effective National Informatics**. To the strategy's main goal count the long-term reducing of ICT costs, consolidation of IT structure, modernisation of the public sector network, integration of public evidence, establishment of efficient e-business, which includes e-identification and e-exchange of data and documents. What is more, Slovenia has been following the EU-triggered **Digital Agenda for Europe**, participating in enhancing of digital literacy, skills and inclusion.

Slovenia's **Public Employment Service** recently initiated a project in cooperation with Microsoft and the NGO Youth Information and Counselling Centre of Slovenia (MISSS) to provide job seekers with necessary e-skills training, covering the costs and thus providing the training essentially free of charge.¹

Summary Assessment of Slovenian e-Skills Activities: ●●

Slovenia does not have a master strategy towards e-skills and lacks measures taken with direct regards to e-skills. Existing initiatives in the area tend to focus on ICT-related modernisation of the country's education system, e.g. the e-Education programme.

Summary Assessment of Slovenian Digital Literacy Activities: ●●●●

Slovenia's government implemented a broad range of measures targeted at ICT users already in the last decade, especially focusing on disadvantaged groups. Some of these policy initiatives have continued, but they have lost in priority in recent years. Grassroots projects have tried to fill the gap, often with considerable success as in the case of the Simbioz@ project.

Summary Assessment of Slovenian e-Leadership & Digital Entrepreneurship Activities: ●●

No initiatives identified apart from some focus on e-leadership within the primary and secondary school system (within the context of the e-Education Programme).

Like in the precursor study² the assessment of the information gathered resulted in two activity indices, one for digital literacy and one for e-skills computed for each country. These were computed based on data from 2009 and 2013. The e-leadership skills activity index was computed only for 2013, as no data had been collected on this topic in 2009. In the following the focus will be on the e-skills activity index; we first mapped the e-skills activity index values against the Networked Readiness Index (NRI)³ for each of the 27 Member States.

¹ http://eryica.org/files/9359_Documents_en_MISSS_Article_EN-1.pdf

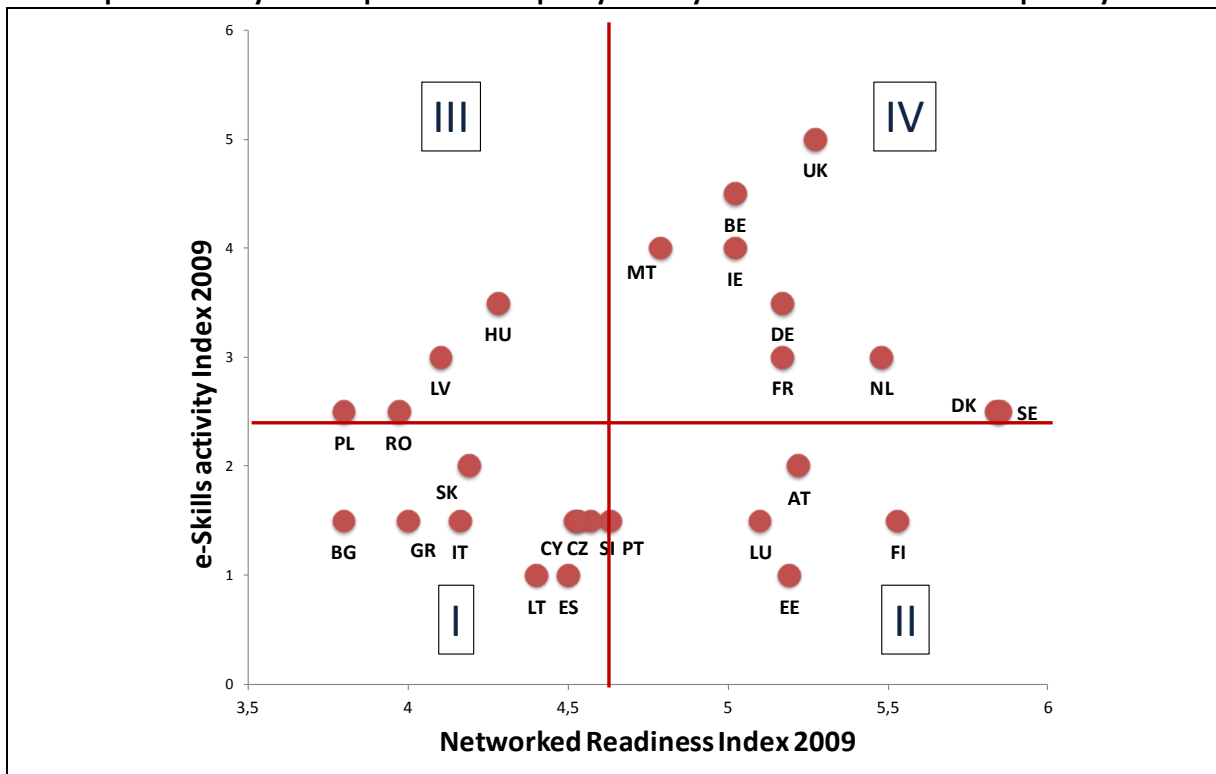
² Hüsing, T. and Korte, W.B. (2010) "Evaluation of the Implementation of the Communication of the European Commission 'e-Skills for the 21st Century'", URL: http://ec.europa.eu/enterprise/sectors/ict/files/reports/eskills21_final_report_en.pdf

³ The World Economic Forum's Networked Readiness Index (NRI) measures the propensity for countries to exploit the opportunities offered by ICT. It is published annually as part of the Global Information Technology Report. The NRI is a

This allows for putting the results of the e-skills policy and activity analysis in the different countries in the wider context of each country’s propensity to exploit the opportunities offered by ICT using data which can be obtained from the country values on the Networked Readiness Index (NRI).

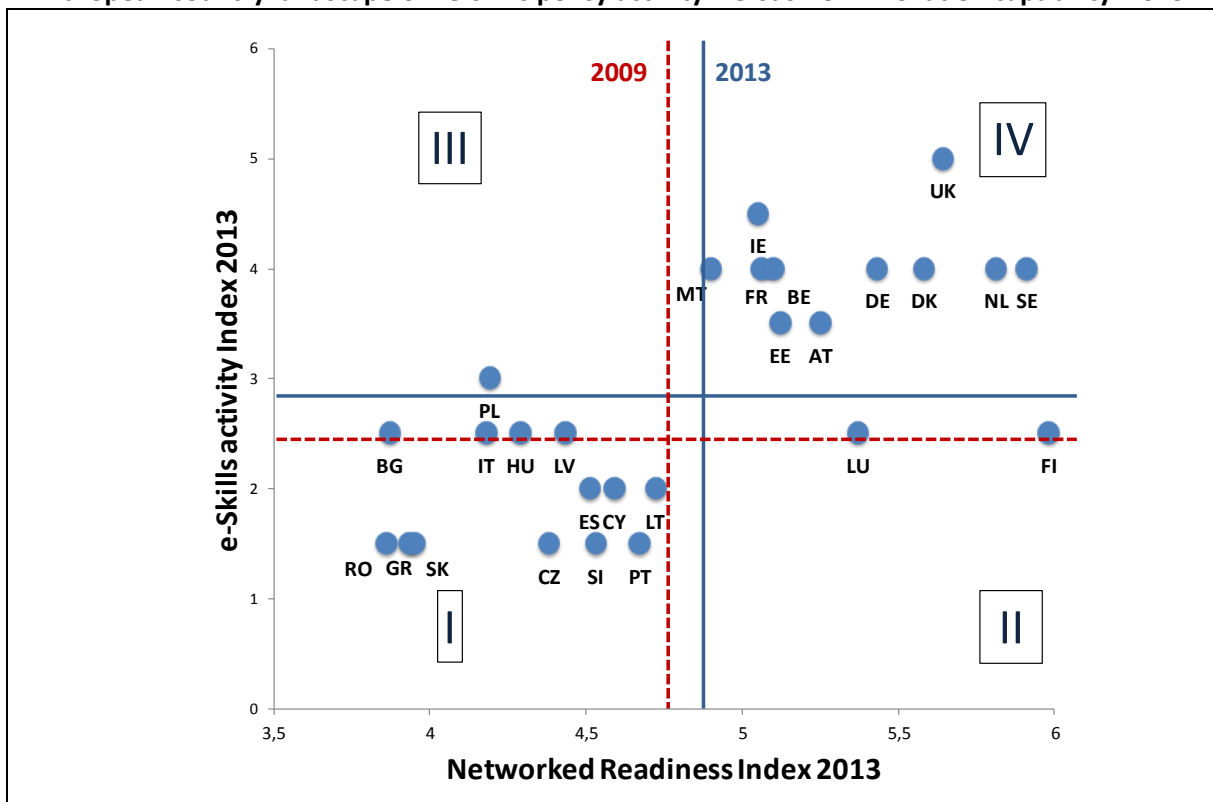
The following figure allows a comparison of the results from this exercise for 2009 and 2013. In the graphical illustrations four quadrants are shown which are built by using the European averages on the NRI and those on the e-skills policy activity index for the respective years in order to group the countries into four main clusters.

European country landscape on ‘e-skills policy activity’ versus ‘ICT innovation capability’ 2009



composite of three components: the environment for ICT offered by a given country (market, political and regulatory, infrastructure environment), the readiness of the country’s key stakeholders (individuals, businesses, and governments) to use ICT, and finally the usage of ICT amongst these stakeholders. For further information on the NRI see www.weforum.org/issues/global-information-technology.

European country landscape on 'e-skills policy activity' versus 'ICT innovation capability' 2013



Overall and for e-skills related policies and initiatives a strong increase of activity levels over the five-year time span can be identified. The unweighted average e-skills policy index score increased from 2.4 to 2.9 between 2009 and 2013. This is encouraging news.

Our analysis revealed that in 2009 three of the four quadrants are well populated by different countries with only 7 countries belonging to the group of top performers both, in terms of e-skills policy index as well as NRI, and 11 Member States constituting those best described as low activity countries (bottom left quadrant).

Five years later the situation has changed significantly; we are now faced with a situation which can be described as a dichotomy in Europe on these indicators: top performing countries as opposed to countries with low activity levels and NRI performance, with only three countries (Poland, Luxembourg and Finland) in transition phases between these clusters.

The group of top performers has grown from 7 to 11 with Sweden, Denmark, Austria and Estonia entering this cluster to which the United Kingdom, the Netherlands, Belgium, Ireland, Malta, Germany and France already belonged in 2009. However, the group of low activity countries is still substantial in terms of numbers of countries with 13 EU Member States – almost 50% showing a below average performance on the NRI and on the e-skill skills policy activity index.

EU Member States fall into two very distinct groups: 41% of the Member States are top performers, almost 50% are low activity countries, and 11% located between these two clusters.

While the former have been successful on the e-skills front and capable of exploiting ICT to become innovative and more competitive the latter group of low activity countries still has a rather long way to go to achieve both.

A look at the Member States' positions in the NRI ranking (Networked Readiness Index) reveals that again, those countries with high NRI positions also show high e-skills policy activity levels. The countries moving up in terms of migrating into the 'top performers' cluster include Sweden,

Denmark, Austria and Estonia, as well as the Netherlands and France which managed to further increase their e-skills policy activity level.

Countries at the risk of losing ground include Hungary, Latvia and Romania which dropped down into the first cluster of countries, i.e. those lagging behind.

European country clusters on 'e-skills policy activity' versus 'ICT innovation capability' 2013

I : low NRI + Low level of e-skills policy activity	II : High NRI + low level of e-skills policy activity
Romania, Greece, Slovakia, Czech Republic, Slovenia, Portugal, Spain, Cyprus, Lithuania, Bulgaria, Italy, Hungary, Latvia	Luxembourg, Finland
III : Low NRI + high level of e-skills policy activity	IV : High NRI + high level of e-skills policy activity
Poland	United Kingdom, Ireland, Sweden, Netherlands, Denmark, Germany, Belgium, France, Malta, Austria, Estonia

5 Selected multi-stakeholder partnerships

The following is a list of multi-stakeholder partnerships of major relevance to the e-skills issue:

- **E-education:** In the e-Education project (2008-13) the Ministry of Education, Science and Sport of Slovenia is designing a national model for in-service teacher training. The purpose is to create e-competent schools and teachers. School leadership and IT experts" standard, based on six key e-competencies required for school staff (including didactic use of ICT in classes, designing e-materials, media literacy, course management, e-learning). Internet safety is integrated as a horizontal topic in all seminars and workshop. School staff are to be enabled to plan, perform and evaluate their teaching by using ICT. Target group are teachers, head teachers and IT professionals in school across all levels – from kindergarten level to secondary schools. Special attention is paid to school leadership and IT experts in schools. The main objective is to develop e-schools as a whole to meet the demands of learning and teaching in the 21st century. Consultancy services have been developed in the form of e-support, didactic counselling and school leadership consulting. The portal Slovensko izobraževalno omrežje – (Slovene Schoolnet) houses learning content and complementary online services and also acts as a communication platform for teachers, students and parents. The total budget of the project has been € 12 million.
- **Simbioz@:** This is a volunteer project first carried out in 2011 by Zavod Ypsilon (NGO) with the goal to increase computer literacy among the elderly with the help of young volunteers. Workshops for bringing together the two generations are held at libraries, schools and retirement homes across Slovenia. Great interest in the project and its success in 2011 and 2012 are the reasons to repeat the project also in 2013. The target is to reach out to more than 200,000 young people and 300,000 elderly citizens and to invite them to come together and get involved in lifelong learning. The older generation will learn about the basic computer functions, how to search for information on the Internet and use of free communication tools like electronic mail. They will also get to know social networks and how to use mobile phones in their everyday life. The volunteers, on the other side, gain practical experience and discover their abilities and hidden talents in offering some of their knowledge to the older generation. The project received European Citizen Award by European Parliament in 2012⁴.
- **E-school bag:** The project objective is to create e-textbooks for the social sciences and foreign languages for use in the eight and ninth class of primary school and the first year of secondary school. Another project goal is to upgrade the Slovenian Educational Network (SIO) and pilot-implement e-textbooks in educational processes. Evaluation of the impacts is also planned for. The project has commenced in 2013 and will run until 2015. The project with the total budget of 5 million euros has commenced in 2013 and will run until 2015. The results of this project will be the basis for the widespread introduction of e-textbooks in the educational process in primary and secondary schools nationwide.

⁴ <http://simbioza.eu/images/porocila2011/Simbioz@finalreport.pdf>

6 Success of e-skills policies and activities in meeting the objectives of the EU e-skills agenda and other relevant European initiatives

The extent to which policies, initiatives and multi-stakeholder partnerships have been successful in helping meet the objectives of the EU e-Skills agenda and other relevant European e-Skills initiatives as seen by national experts is further described below along key actions and action lines of the EU e-Skills strategy and other relevant EU initiatives.

“Longer term cooperation”

An example of successful partnership that promises a long term cooperation is the project Simbioz@. Its’ purpose is to enhance the e-skills of older people and to connect two generations.

“Human resources investment”

At the Directorate for Information Society are currently waiting for the results on e-skills call, where they have applied the programme of elder e-literacy. The importance of the e-literacy among older and retired citizens was indicated by the research *E-competent citizen of Slovenia* mentioned above.

“Attractiveness of ICT jobs”

ICT jobs seem to be very attractive in Slovenia. According to the experts’ observations there is no lack of ICT practitioners in Slovenia. ICT professionals are not registered at unemployment office compared to other nontechnical profiles. However, there is no official research that could confirm these observations. Last study was performed ten years ago.

“Employability and e-inclusion”

E-skilled people have significant advantage in employability. Slovenia demonstrates a high level of ICT usage at work and Slovenians are considered as e-skilled. Other data for Slovenia are not at disposal due to the lack of detailed research on this topic.

“Lifelong acquisition of e-skills”

According to the research *E-competent citizen of Slovenia*, 53% of Slovenians have acquired their ICT user skills mainly via self-learning and on-the-job, and 51% got training from co-workers, relatives and friends.

“Closing the e-Skills gap”

The Directorate for Information Society is currently seeing the biggest gap between e-skills of young and active population and e-skills of older and inactive population. To reduce this gap, it is now mainly oriented in e-skills and e-literacy among older people.

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DG Enterprise and Industry



Annex: data sources

	Source
eSkills21 study: 'e-skills' index 2010	eSkills21 study carried out by empirica. Report available at http://goo.gl/WKV7r
eSkills21 study: 'Digital literacy' index 2010	
EuRA e-skills index	EU-RA 2009: Financial and fiscal incentives for e-Skills: State of play in Europe. Synthesis report. http://www.e-skills-funding.com/images/stories/PDF/synthesisreport.pdf
ICT practitioners in % of total employment 2012	LFS data made available by Eurostat
Digital literacy skills of the population 2009/11:	Eurostat, database "isoc_ski"
• Individuals with high level of computer skills	
• Individuals with high level of Internet skills	
• Individuals using the Internet (last three months)	
Global Competitiveness Index (GCI) 2010/12	The Global Competitiveness Report 2011-2012: http://www.weforum.org/reports/global-competitiveness-report-2011-2012
Networked Readiness Index (NRI) 2010/12	The Global Information Technology Report 2011-2012: www.weforum.org/issues/global-information-technology
• Individual readiness	
• Business readiness	
• Government readiness	
• Individual usage	
• Business usage	
• Government usage	
PISA scores (2009) in:	OECD, http://www.oecd.org/pisa/
• Mathematics	
• Science	
• Reading	

Indicator	Source	Further remarks
ICT practitioner workforce 2012	Eurostat Labour Force Survey. Some imputations and assumptions not in the original data but done by empirica apply	The definition can be looked up in the final report, Gareis et al. 2014: E-SKILLS: MONITORING AND BENCHMARKING POLICIES AND PARTNERSHIPS IN EUROPE.
ICT practitioner workforce 2012 as percent of total workforce		LFS based, number of ICT practitioners / number of workers in all occupations
Assumed excess demand 2012	Empirica, IDC	This is calculated using the percentage of vacancies per existing job and is based on a survey carried out in 2012. As some countries were not covered, several assumptions apply
Forecast excess demand 2015		Forecasts are scenario based and the methodology can be found in the final report (see above). Forecast of demand in the six largest countries (DE, UK, FR, IT, ES, PL) is based on country specific economic scenarios, for the 21 smaller countries only an aggregate scenario was developed and figures allocated according to ICT employment shares.
Forecast excess demand 2020		
Forecast ICT practitioner jobs 2015		
Forecast ICT practitioner jobs 2020		
Workers 2012 - Management,	Based on Eurostat Labour Force	LFS based, definitions can be looked up in the final

business architecture and analysis level	Survey, some definitions and calculation by empirica. Some imputations and assumptions not in the original data but done by empirica apply.	report.
... as percent of total workforce		
Workers 2012 - ICT practitioners, professional level		
... as percent of total workforce		
Workers 2012 - ICT practitioners, technician and associate level		
... as percent of total workforce	Based on Eurostat Labour Force Survey, some definitions and calculation by empirica. Some imputations and assumptions not in the original data but done by empirica apply.	ISCO-88 groups 213 and 312. Due to the break in series in 2010/11 only partly comparable to later data.
Growth core ICT workforce 2001-2010		ISCO-08 groups 25 "ICT professionals", 35 "Information and communications technicians".
Growth core ICT workforce 2008-2010		
Growth core ICT workforce 2011-2012		
Growth broad ICT workforce 2011-2012		Equals the "ICT practitioner workforce"
ISCED 5A/B first degree graduates in Computer Science, 2011	Eurostat, database "educgrad_5"	This figure represents a count of first degrees in ISCED 5A and first qualifications in 5B. See discussion of this indicator in the final report.
... graduates per 1000 population aged 20-24	Eurostat, databases "educ_grad5" and „demo_pjangroup"	Graduates as above. The denominator is used to make data comparable but there is no age restriction in the number of graduates. Some imputations and assumptions may apply.
... graduates 2011 as percent of 2006 (= peak EU)		
Vocational training graduates in Computer Science, 2011	Eurostat, database "educ_grad5"	Number of Computing graduates in Upper secondary education (level 3) - pre-vocational and vocational programme orientation and Post-secondary non-tertiary education (level 4) - pre-vocational and vocational programme orientation. Some imputations and assumptions may apply.