e-SKILLS IN EUROPE

ITALY

COUNTRY REPORT

JANUARY 2014

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1 Overview

Since the second half of the last decade, two main ICT skill areas have become quite crucial for the market in Italy: ICT Project and Programme Management (ICT PM); and Service Oriented Architecture (SOA). ICT PM, was critical for any enterprise that had to develop and implement internal/external ICT projects. Even when outsourcing, it was necessary to identify internal people able to manage the ICT activities and be the interface with the external resources. The needed skills were a mix of ICT and classic project management, or, classic project management applied to ICT. Concerning SOA, they became more and more relevant and with them, the related possible mobile applications as well. In this area, skills were definitely just ICT.

To meet the skill requirement from the market, IT training offer has largely been developed on such issues, paid by companies and ICT practitioners themselves. Such two skill areas are still requested by the market.

On the other hand, the increasing of the WEB and distributed systems, allowed ICT practitioners to evolve in terms of professionalism, the ICT skills have developed coherently with the developing ICT world and its complexity; the relevant profiles have increased in terms of job roles and specialization. The great changes on ICT determined a selection of the more flexible and really skilled profiles. New technologies led to new markets as well. And an expanding economy brought opportunities to the ICT practitioners, too. Those who had the capability to turn themselves into the third generation of ICT practitioners and follow the changing market, focused their activity on three main directions: marketing consultancy (web marketing; digital communication; social media marketing); open source customizations; migration of proprietary client applications into web social applications.

Currently, thanks to the SOA, the web, the mobile applications, etc., Business Analytics skills have become more and more critical to understand the new trends and evolutions and identify new services. This set of skills has to integrate both ICT know-how and management capacities. Specific IT training on Business Analytics skills start to be requested by the market.

However, ICT SMEs and ICT practitioners are still very interested in SW development skills with HTMLS technologies; operational systems for mobile technologies such as android; web design. A very high offer of training courses in these topics can be easily found within the IT training offer. Likewise, the social media marketing and security is another set of mixed ICT and managerial skills requested by ICT SMEs who are mostly ready now to invest their time and money for acquiring this know-how.

Moving to medium and large sized enterprises, from the demand side, namely ICT end-user companies, the evolution looks a bit wider. Slowly, in the last decade, such enterprises, mainly Telco and finance, have started to introduce best practices and guidelines on ICT process management (ITIL is the main relevant example). With these new managerial approaches, the ICT offices and functions inside companies have started to pay their attention to outside their boundaries, speaking with other internal functions such as business or finance. They started to develop communication abilities, an orientation to listen to interlocutors different from themselves; they have started to identify and propose services required from the other offices. Demand management, service management and change management, have become critical competences in such medium and large companies, where the borders between them are not always clear, depending on the internal company organisation. The need of a common language increased, the most important skills have become, listening to and leading.

Italy faces a number of problems in the e-skills domain: An inadequate digital culture is the real barrier against a clear and consequent demand. Most SMEs' owners from ICT demand side, are mainly aged people who scarcely understand the challenges of internet and how the web

implicates their business, communication and marketing as well. Whereas such a challenge is caught, the lack of a shared language and a common reference model makes the match between demand and supply for ICT practitioner skills quite difficult and deceitful. On ICT skills supply side, the relatively ease of the initial boom with no regulation and a low culture towards quality, led to the establishment of many consultants and very specialized small enterprises which hardly commutated their skills and offer when the ICT landscapes changed into the web and social development.

Entrepreneurship's business competences didn't adequate themselves as much as the ICT practitioners did. On the demand side, a low digital culture is accompanied by a very low Innovation Culture which does play instead a fundamental role in becoming aware of the ICT potentiality for business as well as the clearness of what skills to research.

Innovation and Digital Culture might be fostered by the young ICT practitioners coming out of the education system. SMEs might more easily introduce them into their companies because of lower economical impact and, on the other hand, they might benefit from their knowledge and competences on ICT as a business driver. Unfortunately, SMEs don't invest in human resources, also due to the very restrictive Italian laws about labour market, and are even afraid to hire postgraduate young people, being convinced they have nothing to teach to the older people but are too much theoretical and far from the concrete problems of SMEs.

On the other hand, even ICT SMEs should enhance their culture in terms of management and marketing skills. In fact, only few SMEs are currently able to catch the opportunities from the cloud computing and the open data new phenomena. E.g., the PA will move to the cloud in the foreseeable future (it is planned to move from more than 40,000 servers covering the Italian territory to 50 ones on the whole). The ICT SMEs will help small local PA structures to renew their ICT systems in cloud but then, such local PA realities won't need ICT support as before anymore (moreover they will likely refer to big vendors as foreseen by the central PA). Which new roles for the ICT SMEs? They will have to re-think themselves and their products and services. If they are not able to understand new business opportunities coming out of cloud computing and open data, they will fail and close.

Moving to medium and large ICT end-user companies, the low willingness to invest in human resources was one of the key factors that slowed down the ICT evolution towards best practices and the ICT process management. This move implies different job roles and skills, i.e., soft and managerial skills, know-how ofICT methods and approaches, including e.g. KPIs to evaluate the services. This means, training. Even now, many enterprises don't consider ICT training in this direction as something necessary. They don't want to invest. Even vendors, who should foster an ICT culture, tend to offer ICT services and products according to old and overcome IT models. Moreover, the roles of new CIOs and ICT profiles related to the ICT management are still not formally recognized as the other ICT profiles and job roles are, which are associated to the national bargain.

Likewise, innovation in the Public Administration Sector should represent another key driver for ICT skills demand and offer. Currently, the only real efficient e-government service is represented by INPS, the National Social Insurance, which is in the top position at European level. But that's not enough to speed up ICT skill growth and make the labour market more dynamic.

One more challenge is the deficiency of the infrastructure. The less the infrastructure performance, the less the ICT practitioner skills are asked and researched, endangering the sector.

On the whole, it lacks a direction, a strong coordination which leads the change. Currently three Ministries are in charge for the Digital Agenda and that lows down the process. It would be taken under the responsibility of the Ministers' Presidency as the only clear reference for all.

On the other hand, these structural issues explain why the central government has prioritized actions to improve infrastructures, first, then the overall culture, implementing initiatives to overcome the digital divide. In this scenario, ICT skills and e-leadership skills are delegated to the labour market itself and the key, reference players.

The outlook for the future is as follows:

Regarding the continuous education of ICT practitioners, initiatives such as online workshops and fair's seminars are the main chances offered to keep themselves up-to-date.

The time looks ripe to promote actions for a wider digital culture which would rise and consolidate the general ICT demand, and also promote more effective partnerships among the stakeholders for adopting common frameworks such as the e-CF, in order to develop a shared referenced system and a more regulated market.

Cloud computing is one of the main ICT trends, pulling the market of the ICT integration. The great major of vendors concentrate their skills as System Integrators. The ICT SMEs have chances to provide the market with a wide range of skills and a flexible support to integration process,

Open data and big data are the next challenge. Concerning open data, currently, Public Administration (transportations have started first) make their data available for all. In Milano most Bus and Metro stations have the so called "stake" where you can check-in and give your geographic position to the system. Big data, as well, whereas data and information are scattered in the web instead of being gathered in one DB.

Both Cloud computing and Open data opportunities open the door to new possible services, so business analytics competences are becoming more and more required, namely a mix of ICT skills and marketing, commercial understanding.

Dematerialisation and all the related skills are becoming critical especially in the PA; either the CIO profiles will change, requiring further competences, or new profiles will be created to plan, develop and manage the new process (or both…). Currently, dematerialisation is meant as document translation from .doc form or even paper form, to electronic pdf files, to be just uploaded. Dematerialisation is much more, of course. It also refers to processes and their transparency: more and more, processes have to become electronic, activities have to be formalised in digital procedures, they are to be traceable,... Accordingly, administration office alone cannot manage the dematerialisation process and a web master, usually the reference ICT profile for the documents uploading, either. The same is for the legal office, who also usually manages such processes, especially in regard to the copyright and private data issues. Accordingly, dematerialisation seems a process to be led by ICT professionals, however, ICT professionals have to learn e.g. about legal publicity. Moreover ICT professionals have to learn how to formalize the work flow and the work progress to make them traceable and transparent.

Concerning PA and digitalisation of their services to citizens, eBusiness means, e-commerce on the one hand, and interoperability of digital services, on the other hand. In this perspective, ICT professionals operating in the PA, have to understand and foster interconnection opportunities and be able to build "federations" of systems/services, autonomous but interconnected and interoperable.

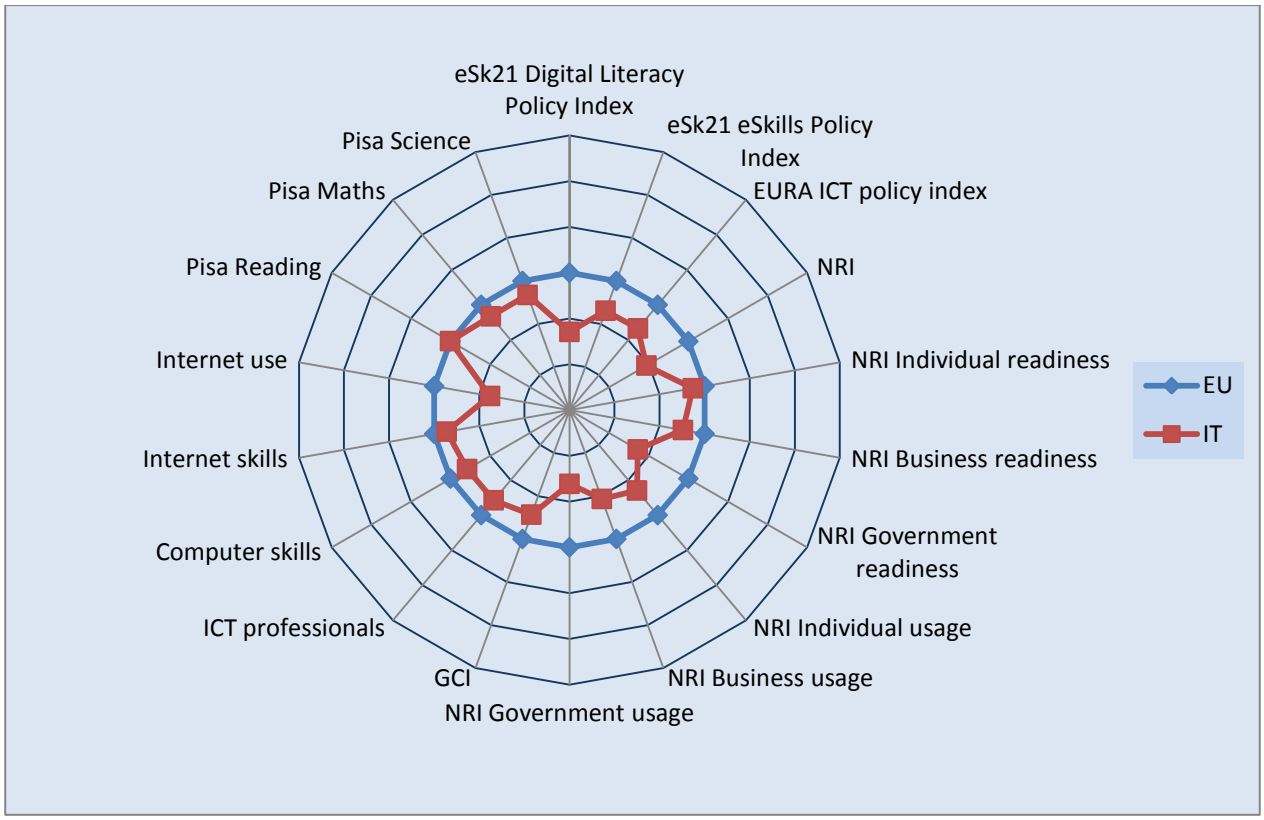
Finally, this is more an expectation than a forecast, the willingness to invest in abilities and skills more than mere technologies would be the key success factor for the future. Interprofessional funds for training should be simplified to easily use the money that is to be earmarked for that.

Concerning the ICT training content and skills, the necessity to analyse and understand the service, first, and then manage project and process properly, are the main challenges. ICT Project and process management certifications are needed to increase the overall quality.

In this scenario, transparent qualification systems and ICT sector regulation will offer opportunities for a clear and wider visibility and transferability.

2 Indicators on innovation, competitiveness and ICT skills

Italy						
	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	**1.5**	**24**				Max.: 9.0
EuRA e-skills index	**2.4**	**21**				Max.: 5.0
ICT practitioners in % of total employment 2012			**2.86%**	**17**		EU average: 3.43%
Digital literacy skills of the population 2009/11:						
• Individuals with high level of computer skills	**23%**	**16**	**25%**	**17**	↓	EU average: 28.52%
• Individuals with high level of Internet skills	**9%**	**11**	**12%**	**14**	↓	EU average: 13.67%
• Individuals using the Internet (last three months)	**46%**	**24**	**54%**	**14**	↑	EU average: 71.33%
Global Competitiveness Index (GCI) 2010/12	**4.3**	**20**	**4.43**	**16**	↑	Max.: 5.61 EU median: 4.52
Networked Readiness Index (NRI) 2010/12	**4.2**	**22**	**3.97**	**21**	↑	Max.: 5.6. EU median: 4.5
• Individual readiness	**5.47**	**26**	**4.95**	**17**	↑	
• Business readiness	**4.78**	**15**	**4.27**	**18**	↓	
• Government readiness	**3.77**	**26**	**3.44**	**25**	↑	
• Individual usage	**3.84**	**14**	**4.58**	**21**	↓	
• Business usage	**4.61**	**22**	**3.21**	**21**	↑	
• Government usage	**3.77**	**26**	**3.22**	**25**	↑	
PISA scores (2009) in:						
• Mathematics	**483**	**19**				EU median: 493
• Science	**489**	**20**				EU median: 498
• Reading	**486**	**14**				EU median: 489


eSk21 Digital Literacy Policy Index
eSk21 eSkills Policy Index
EURA ICT policy index
NRI
NRI Individual readiness
NRI Business readiness
NRI Government readiness
NRI Individual usage
NRI Business usage
NRI Government usage
GCI
ICT professionals
Computer skills
Internet skills
Internet use
Pisa Reading
Pisa Maths
Pisa Science
EU
IT

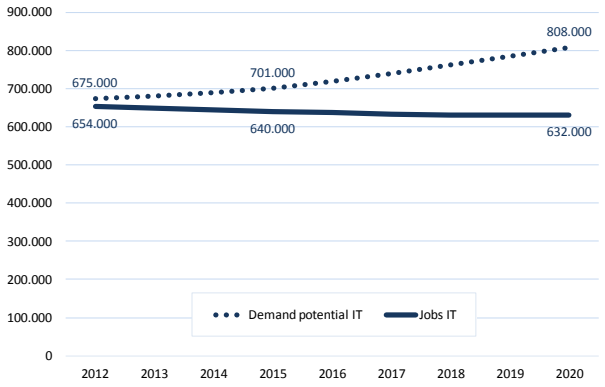
3 E-skills demand and supply forecasts 2012 – 2015 - 2020

Italy			
	IT	**Rank EU27**	**EU27**
ICT practitioner workforce 2012	**654,000**	**4**	**7,403,000**
ICT practitioner workforce 2012 as percent of total workforce	**2.9%**	**17**	**3.4%**
Assumed excess demand 2012	**22,000**	**4**	**274,000**
Forecast excess demand 2015	**61,000**	**3**	**509,000**
Forecast excess demand 2020	**176,000**	**2**	**913,000**
Forecast ICT practitioner jobs 2015	**640,000**	**4**	**7,503,000**
Forecast ICT practitioner jobs 2020	**632,000**	**4**	**7,950,000**
Workers 2012 - Management, business architecture and analysis level	**69,000**	**6**	**1,477,000**
... as percent of total workforce	**0.3%**	**22**	**0.7%**
Workers 2012 - ICT practitioners, professional level	**140,000**	**7**	**3,393,000**
... as percent of total workforce	**0.6%**	**27**	**1.6%**
Workers 2012 - ICT practitioners, technician and associate level	**445,000**	**1**	**2,532,000**
... as percent of total workforce	**1.9%**	**2**	**1.2%**
Growth core ICT workforce 2001-2010	**5.4%**	**12**	**3.0%**
Growth core ICT workforce 2008-2010	**0.2%**	**19**	**2.6%**
Growth core ICT workforce 2011-2012	**4.3%**	**18**	**3.9%**
Growth broad ICT workforce 2011-2012	**3.1%**	**16**	**1.8%**
ISCED 5A/B first degree graduates in Computer Science, 2011	**2,420**	**8**	**113,000**
... graduates per 1000 population aged 20-24	**0.8**	**27**	**3.6**
... graduates 2011 as percent of 2006 (= peak EU)	**68%**	**24**	**88%**
Vocational training graduates in Computer Science, 2011	**0**	**25**	**67,000**

Sources and notes: see annex.

ICT workforce: Demand and Jobs in Italy 2012-2020

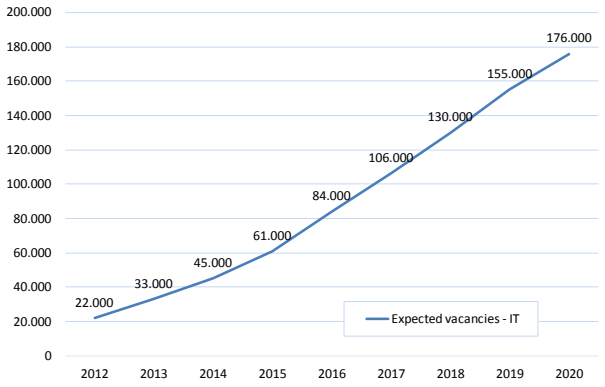
(Main Forecast Scenario)



Source: empirica 2013

e-Skills shortage: Potential vacancies in Italy 2012-2020

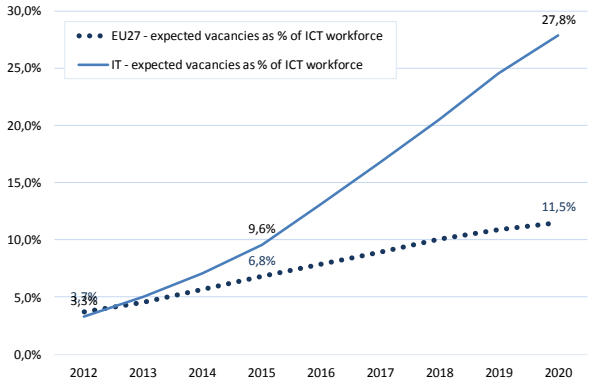
(Main Forecast Scenario)



Source: empirica 2013

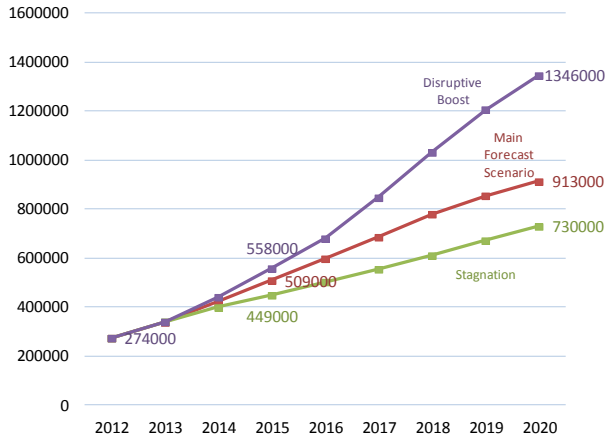
Potential vacancies as percent of ICT workforce Italy 2012-2020

(Main Forecast Scenario)



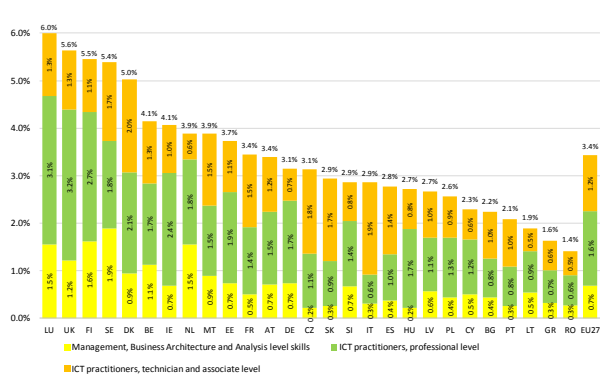
Source: empirica 2013

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



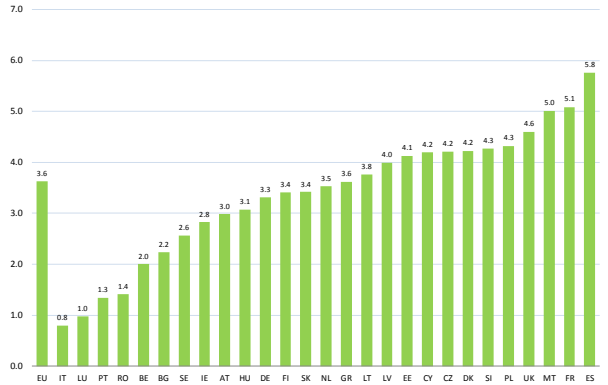
Source: empirica 2013

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

On 19 October 2012 the National executive Law for the implementation of the **Italian Digital Agenda Programme** was published in the Official Gazette of the Italian Republic.

It keeps up the e-Gov 2012 plan initiatives launched in 2009 enriching and enlarging them, in line with the Europe 2020 Strategy and in strong relationship with the Digital Agenda for Europe.

The Steering group is composed by the six ministries mainly involved in its implementation: Ministry of Economic Development, Ministry of Public Administration, Ministry of Education and Research, Ministry of Finance, Department for Territory Cohesion and Department for publishing of the Presidenza del Consiglio; and the nominated representatives of the Italian Regions, Provinces and Municipalities.

The programme focuses on the strategic axes mentioned above and includes short and mid-term actions in the areas of the Digital Identity, Digital PA/Open Data, Digital school and University, Digital Health, Digital Justice, Digital Divide, e-payments; all this under the international scenario of a ”digital market” based on high speed internet/superinternet, and interoperable applications.

The launched operative plan intends to make up for the delay of Italy against the other European countries, investing till now only 2% of the GDP, i.e. 10% of the total national investment (source doing business 2012 World Bank Report).

With this programme, a budget of approx €2.5 billion –from national and European funds– has been approved for the first year of investment. The next projects will then be launched and managed directly by the Agency for Digital Italy.

The planned investment is expected to produce 4.3 billion euro and up to 54,000 permanent employees and 19,000 occupied people just during the phase of spending. A strategy capable of raising the national GDP nearly a quarter of a point (0.24%) permanently, Therefore, the return will be sufficient to amortize (i.e. renew) the investment, and also to self-finance it through normal taxation.

This short-term programme does not consider the funds planned from 2013 onwards, the impact of which would be additive; it rather focuses on the most urgent measures able to take in the short term major changes in the daily lives of citizens. From 2013 electronic identity documents only will be issued; the ID card and the health card will be unified; everybody will have a digital address to communicate with the PA and each company will have a certified e-mail address. A single national, interoperable register will be operative and the census will be exclusively electronic and continuous, as well as the students' register. Health, education, justice and work are the areas in which the complete digitalization of the PA will be carried out: the first step is to "switch off" the paper by 2013-2014 at school.

The Italian Agenda fosters the "open data paradigm" to ensure availability of information in reusable format free of charge and without restrictions. Accordingly it obliges the PA and anyone who makes use of public funds to provide its services / digital products, compliance with the accessibility requirements. In this way, even users with disabilities can take advantage of the vast possibilities that ICT offers to be included in the Network Society.

Furthermore, 150 million euro of national resources have been devoted to the completion of the wideband plan. Accordingly, the strategic ultra-wideband project has been launched – for now concentrated in the south of the country, with almost 600 million Euros, besides a number of simplification measures to accelerate the deployment of the mobile and fixed broadband and ultra broadband, with a particular focus on next-generation networks and LTE (4G).

To facilitate electronic commerce, from 2014 enterprises will accept payments made through debit cards, to spread electronic money and let people familiarize with these systems, ensuring transparency in payments and, therefore, the emergence of capital submerged.

Short-term initiatives in the Education System include the following:

- From the academic year 2013-2014, the electronic file of the student will be introduced. It is a tool that collects all the documents, records and data related to the course of study and allows the electronic management of the entire university career. It is also first step to the dematerialization of information flows between universities, facilitating and simplifying the mobility of students.
- UniversItaly is the dedicated platform to students, families, schools and universities that simplifies access to information, in accordance with the principle of transparency of public institutions (Article. 52 of CAD) and offers services dedicated to the academic world.
- From the school year 2013-2014, schools will gradually adopt textbooks in digital version only, or combined with the printed version.
- Since the school year 2012-2013, the geographic areas particularly isolated (e.g. small islands and mountain towns where there is an insufficient number of pupils for the formation of classes) have set up digital educational centers through special agreements with the Ministry of Education and Research, which allow students to connect virtually to remote classrooms.

Mid-term initiatives in the Education System include:

- Scuola in chiaro: the same initiative just carried out for universities is now under implementation for the Italian schools system (Primary and Secondary school).
- Il Cloud Nazionale della Scuola: The cloud of the National school is the environment to gather both the Italian school numerous initiatives and the related digital content. The realization of the cloud for the school allows to "eliminate" the more than 9,000 servers of the Italian schools, to relieve the schools of all management problems that they have to face with without the proper profiles inside, ensuring services and digital content quality. The aim of the project is to create a cloud to integrate content and teaching solutions, giving teachers and students a secure, confidential, and organized virtual space structured into three areas: Repository of digital content; Educational services for teachers and students; and Cloud Spaces dedicated to each teacher and each student.
- Scuola 2.0: it is a programme for the implementation of web devices to support didactics, allowing distance learning and teaching to facilitate isolated students and small villages far from the main cities.

All what described above refers to the national plan and central input for initiatives to be developed throughout the national territory. As we can see, specific initiatives on e-Leadership skills have not been planned yet from the central government.

In fact, digital literacy, ICT awareness at all levels of population and even in many business sectors, not least school itself, are still evident needs. Accordingly, the central government prioritized initiatives aimed at awareness raising (addressing critical topics such as cyber security and e-commerce), digitalization and digital literacy of schools and teachers and non-ICT micro enterprises.

e-Leadership initiatives are seen as under the responsibility of the market itself. Namely, supply and demand (in terms of education and training, the school system, including university and vocational training, as well as ICT professionals and enterprises) have to find common agreements locally to develop proper initiatives answering labour market requirements. Concerning secondary school, the school autonomy allows any of them to identify specific courses and initiatives meeting the companies' needs, locally. The so called interprofessional funds support vocational continuous training according to companies' requirements. The new law on apprenticeship regulates it at

several proficiency and qualification levels, including the so called "Alto" Apprendistato ("high" apprenticeship) addressing postgraduate young people. At any levels, it is a two years programme of training and job very similar to the German "dual system". The Alto Apprendistato is managed by universities together with enterprises and it is built according to the real needs perceived by the business. Finally, several universities organize MBA and executive MBA addressing young people, professionals and young managers. Under this context, ICT training initiatives related to the e-Leadership have been developed at "high" apprenticeship level, in the MBA courses and some dedicated executive MBA courses; the Technical University in Milano has also some specific courses on e-Leadership skills at bachelor and master degree levels. The "high" apprenticeship courses get regional funds; the university courses are included in the standard curricula subject to annual university enrolment fees; MBA and Executive MBA courses are private initiatives with quite expensive rates. The same for any further initiatives from private training institutions addressing professionals and managers.

Summary Assessment of Italian e-Skills Activities: ●●◖

Italy lacks a master strategy, and activities are concentrating on infrastructure and teacher training in universities. There is strong industry support, however, for application and mainstreaming of the e-CF. In this respect, the Italian Competence Network for the Digital Economy has been a very important initiative.

Summary Assessment of Italian Digital Literacy Activities: ●●◖

Italy has no master strategy for e-inclusion, but a range of activities concentrating on infrastructure and teacher training are in evidence. Computer science is now taught starting from primary school.

Summary Assessment of Italian e-Leadership & Digital Entrepreneurship activities: ●◖

No policy initiatives are in place which explicitly deal with e-leadership skills or digital entrepreneurship. The education system, however, has started to develop some course programmes providing such skills.

Like in the precursor study[1] 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)[2] for each of the 27 Member States.

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).

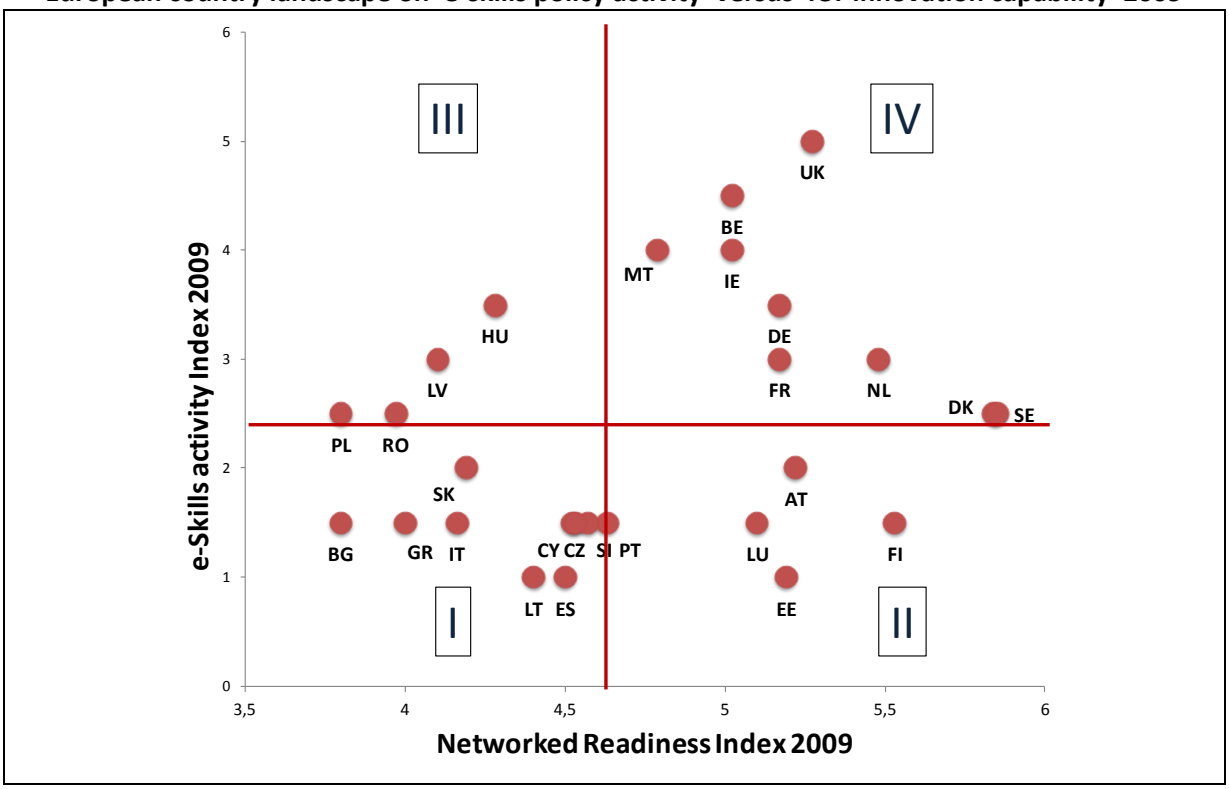
The following figure allows a comparison of the results from this exercise for 2009 and 2013. In the graphical illustrations four quadrants are shown which are built by using the European averages on

[1] 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

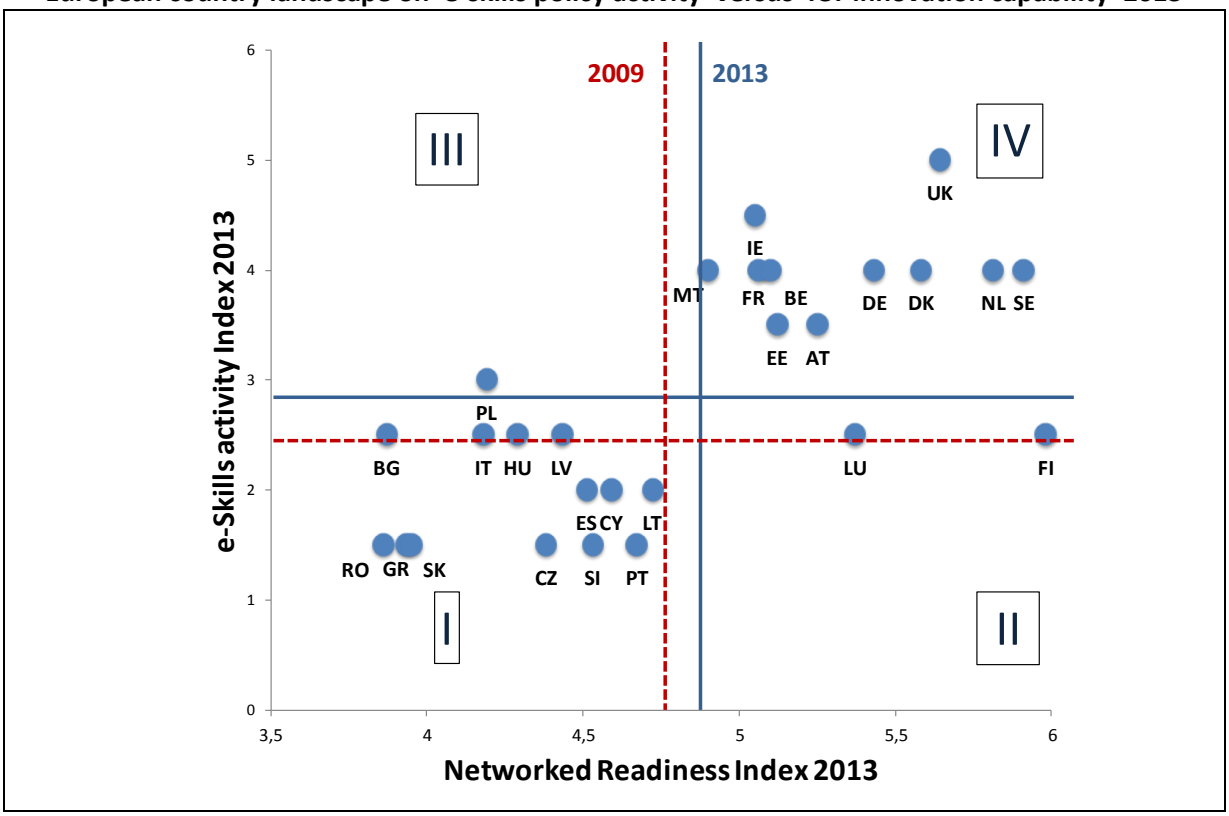
[2] The World Economic Forum's Networked Readiness Index (NRI) measures the propensity for countries to exploit the opportunities offered by ICT. It is published annually as part of the Global Information Technology Report. The NRI is a composite of three components: the environment for ICT offered by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

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



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:

- **RETE Competenze per l'Economia Digitale (Italian Competence Network for the Digital Economy) [selected as Good Practice]**: The network aims to raise awareness about e-competences and disseminate the e-CF. It also aims to develop and supply training programmes focused on the 36 e-competences to create e-leadership based culture within the IT-SMEs. IT-SMEs and ICT professionals in general need support to grow and be competitive internationally. E-Leadership skills are the basis for driving the change and support clients' requirements. The Network believes that the e-CF is a good lever to disseminate this culture and an effective guidance for training. Stakeholders are the main company associations in Italy: ASSINTEL, ASSINTER ITALIA, CNA COMUNICAZIONI, CONFINDUSTRIA DIGITALE, and UNIMATICA. The Network operates throughout the national territory and targets ICT and end-user companies, as well as policy makers and public administration. Main achievements so far have included: three workshops realized with participation of about 150 SMEs on the key role of e-competences; the decision of the service sector trade unions to develop a job matching web tool based on the e-CF (see below); and the draft of the general e-CF-based national standard for the ICT professionals (UNINFO Technical Committee), which is under public consultation at the time of writing.
- **UNI national standard for ICT Professions based on the e-CF**: Italy is still missing a set of shared, common reference standards for education and occupation. Especially in the ICT context, it is becoming more and more urgent to offer a compass and a quality tool to all stakeholder involved, from employers seeking to hire new staff to those who provide training and jobseekers themselves. All of these need clear reference standards which are recognised within Italy and internationally. The European Competence Framework (e-CF) is regarded as a good starting point for this purpose. Accordingly, the objective of the initiative is to agree on a reference standard for developing a competence-based ICT culture within SMEs, focusing on e-Leadership skills and proficiency levels. A UNINFO Technical Committee was established at the end of 2012 to develop a general standard for ICT professions, based on the e-CF. The Technical Committee met several times to take decisions about possible adaptations of the e-CF to the Italian context. The final decision was that possible improvements would have been suggested to the CEN Workshop directly. The objective of the initiative is to get a reference standard as starting point for developing a competence-based ICT culture within SMEs, focusing on e-Leadership skills and proficiency levels. Stakeholders include representatives of nearly all major companies in the ICT sector, the SME community, universities, ICT professional associations and industry associations, as well as the Agency for the Italian Digital Agenda.
- **JobICT: A New Web Portal for Supply & Demand of ICT Practitioners**: This initiative of the Italian service sector trade unions is a job matching web portal for ICT practitioners and SMEs, based on the Italian e-CF national standard. The e-CF represents the innovative aspect of the service. In fact, jobseekers are enabled to declare their e-competences and SMEs can ask for exactly the e-competences and ICT profiles they seek, both according to the issued standard.
- **Futuri IT Leader**: The objective of this initiative by the Chief Information Officer Forum of the IT industry association (CIO AICA Forum), is to provide a whole, very concrete, experience-based picture of the future IT leaders, to promote awareness about IT professionals and their growing role within Italy's economy. There are ten webinars every month followed by conversations and discussions in the IT leaders web community. The webinars address ICT practitioners aiming to grow and are held by CIOs of large ICT end-user companies in Italy. They describe their experiences focusing on a specific topic each, corresponding to a set of e-competence from the e-CF. The initiative started September 2012.

- **Seminars and communication campaigns on e-commerce**: The seminars are organised by the local Chambers of Commerce and sectoral company associations addressing SMEs; whilst the communication campaign is mainly managed by RAI, the main Italian Broadcasting Corporation, under the direction of the Ministry of the Economic Development, and addressing the whole Italian population through targeted advertising on television and radio. The objective is to promote e-commerce as an effective lever to improve the business through a) a series of seminars on the potentialities and opportunities for the implementation of eCommerce services and optimize sales channels, IT Security and legal aspects; b) a communication campaign to raise awareness. To foster a culture on ICT security from both ICT end users and ICT SMEs point of views
- **Adottaun'impresa (Adopt An Enterprise)**: The project aims to disseminate among micro enterprises digital culture, communications, marketing of goods and / or services, improvement of management processes, through mentoring university students enrolled in the second year of the Faculty of Computer Science or related.
- **GenerazioniDigitali**: The Digital Generation initiative, operated since 2011 by the NGO Fondazione Mondo Digitale in partnership with Auser e Anteas and Fondazione con ilSud and primary/secondary schools in the Calabria region, has involved school students at all ages in the transfer of digital skills to the adult Italian population. The students have become the main vehicle for the dissemination of digital skills by offering a blended, flexible training environment, hence manageable in the classroom or at home. Students were asked to plan activities involving adults in their family and community (on social networks, related to audio or video content such as graphic design, collaborative initiatives on blogs and web publishing platforms, preparation of micro-flash applications for educational videogames, use of PA services online, training for eCommerce capability in searching reliable information). The objective was to reduce the digital divide that characterizes the adult population by promoting models of intergenerational learning and through the involvement of students, the digital natives, who will play as a tutor toward adults. Over the two-year duration of the project, 120 digital literacy courses have been provided until the project's end in April 2013, involving 8,000 citizens aged 60 or older as well as 1,500 students as tutors and 240 teachers. An evaluation is currently being conducted by the Fondazione Mondo Digitale in conjunction with their UK partner NGO AgeUK.
- **Piano Nazionale Scuola Digitale**: The objective of the Digital School National Plan (2010-2014) is to reduce the digital divide inside the school, especially between teachers and pupils. The National Plan foresees teacher training to be provided by the Agency for Research and Innovation (INDIRE). The plan includes a gradual transformation of the learning environments, making the school one of the drivers of the development of digital skills in the country. The plan also intends to facilitate students living in small or isolated towns through distance learning applications and programmes. The programme includes three phases: (1) Piano LIM: Set-up of interactive, multimedia board (LIM) in the classroom; (2) Cl@ssi 2.0: Equipment of students with digital end devices and integrating them with each other and with the LIM This will mean creating a learning environments which allows the use of technology for school activities and learning activities – the same technology that students already use for their own personal. This initiative involves all teachers in the class, with the aim of exploiting digital devices. (3) AzioneScuol@ 2.0: Change the learning environment in the school system, so that educational activities, both formal and informal (curricular and extra-curricular) activities, enable a distributed learning where the student is the center. The strategy combines teaching innovation with new school structural and infrastructural models of human resources organization. Accordingly, the way of "being at school" and the "school time" as well change, the collective space of learning can extend beyond the physical boundaries of the building. It allows the creation of fully personalized training for students.

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"

Large ICT companies, especially telecommunication, have joint partnerships with the PA to foster and support experimental digital implementations especially in the school system.

In the last few years, SMEs from both demand and offer side, have started to understand more and more the importance and the strategic relevance to set synergies between them and build up informal networks.

Under this scenario, company associations are playing an increasing role to facilitate such multistakeholder partnerships and become a reference point for the SMEs requirements.

Currently, in Lombardy there is the attempt to unify all the local ICT profiles and competence frameworks into the e-CF through partnerships and alliances between stakeholders, which agree on the reference standard: the work of Assintel and the trade Unions, on the one hand, the Province of Milano with its Città dei Mestieri, and CNA Comunicazione, on the other hand, are a first trial, where different stakeholders meet together on a common need and cooperate to create a shared tool (based on the e-CF).

Moreover, cooperation looks more and more critical in training, not only in order to design effective training paths, but also to enhance a culture of training, awareness and also practical information such as where to get possible funds.

The interprofessional funds are a good mechanism, even though with several limitations due to the bureaucracy behind. However, most SMEs don't know anything about this opportunity. The same is about the so called vouchers. In this context, partnerships and the Associations themselves are needed to provide help, disseminate these tools and explain how to choose good initiatives in the jungle of the ICT training offer that very often is of low quality.

"Human resources investment"

The unstable situation of the international economy jeopardizes any types of investment; the Italian market lacks a medium-long term clear vision which contributes to hamper any entrepreneurial initiative. It is necessary to identify "safe" markets which guarantee a minimum level of stability, to invest.

Salaries have suffered decrease in the last six years, with about -30% in the highest ICT profiles. Due to the national labour market law, companies, especially SMEs have more and more difficulties to hire professionals permanently. High level ICT training is not fostered and the new required managerial ICT profiles are not properly developed through good professional training paths.

Internet and Mobility are upsetting the classic collective bargain, whereas ICT professionals may work anytime anywhere.

There are not clear national frameworks for contracting new ICT profiles.

In Italy there is not a central structure for continuous education. This implies that Italian population, including SMEs and ICT practitioners have not a culture of lifelong learning. This hampers self-learning initiatives, even e-learning opportunities. On the other hand, it is very difficult to find public funds for IT training, if we exclude basic training aimed at reducing the digital divide or ECDL.

In January 2013, the largest Italian interprofessional fund launched a programme for e-commerce and digital innovation allocating one million euro. Requests received exceeded three million euro. The programme has been closed and most applicants won't be funded.

"Attractiveness of ICT jobs"

Especially thanks to the recent eSkills week initiatives, new campaigns and events have been developed for young people. The recently destroyed Città della Scienza in Naples was born to be a reference point for young people and attract them towards science, math and technological issues. The Museo della Scienza e della Tecnica in Milano is quite active to organize systematic initiaves fostering scientific culture and thinking in young people (no matter of gender).

Concerning wages for ICT practitioners, 2011 records stagnating wages regardless of qualification and specific business sectors. Also the ICT sector faces stagnation, although it seems that in the ICT Services and Consultancy the situation for employees is better (on average, 27K euro/year).On the whole, the situation looks even worse with -1K euro on average for managers and workers. OD&M results are consistent with the just closed survey from Fondazione Politecnico di Milano, on behalf of Assolombarda, conducted with 1200 postgraduates employed in the last 10 years. Around 70% of respondents' net salary ranges between 1000 and 2000 euro; and nearly 75% of the sample are developers (excluding pure HW)[3].

"Employability and e-inclusion"

The main investments on ICT from the central Government in the last ten years have been addressed to reduce the digital divide and focused on digital literacy of population: young people, teachers, SMEs employees. The interprofessional funds have been quite engaged in funding basic IT training aimed at spreading the basic user ICT skills mainly referring to ECDL.

A massive intervention addressing several thousand of employees to be re-skilled in the ICT was launched a couple of years ago supported by the social parties.

The question is that such initiatives are not consolidated being not part of a structured mid-long national plan.

"Lifelong acquisition of e-skills"

As underlined above, lifelong learning is not part of the national culture and e-learning is still not seen as an efficient way for self and continuous learning. There is not the know-how and the culture to distinguish good e-learning services from bad ones. The risk to buy non-effective training is very high.

The mechanisms for reporting expenditures and getting funds in training (not only ICT training) don't allow funds for e-learning or any other form of training beyond the traditional classroom.

On the whole, the possible available funds (coming from companies themselves, i.e. from their surplus and allowance), are very difficult to be really used. SMEs have difficulties to prepare the

[3] The sample is currently of 533.710 profiles. It has been gathered through specific services of OD&M Consulting (Gi Group) http://www.odmconsulting.com/between 2007 and 2011. The sample is managed through automatic and manual assessments which guarantee the reliability of data.

financial reports required to get money back. So SMEs have to spend money to ask for support, in order to use their own money ….

"Closing the e-Skills gap"

There is a strong need (unfortunately perceived only by a part of the market and in general not supported by proper investments) for methodological and leadership competences in ICT.

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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		
Growth core ICT workforce 2001-2010	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 2008-2010		
Growth core ICT workforce 2011-2012		ISCO-08 groups 25 "ICT professionals", 35 "Information and communications technicians".
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.