Towards European e-Skills Quality Labels for ICT Industry Training and Certifications

Proposals for quality labels, associated services and tools

Prepared for the European Commission, DG Enterprise and Industry
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Imprint

This brochure has been prepared by empirica Gesellschaft für Kommunikations- und Technologieforschung mbH on behalf of the European Commission, Enterprise and Industry Directorate General. It is a publication of the European “European e-Skills Quality Labels for ICT Industry Training and Certifications” study.

Editors

Werner B. Korte, Tobias Hüsing empirica GmbH
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This brochure presents the main findings and conclusions of the study "European e-Skills Quality Labels for ICT Industry Training and Certifications" carried out on behalf of the European Commission, Enterprise and Industry Directorate General, by empirica GmbH, Bonn (Germany), with the support of EXIN (The Netherlands) and a large group of European e-skills experts.

The main goal was to develop proposals for a European e-skills quality label, along with prototype online services and tools to promote transparency and to provide guidance in the market for ICT industry training and certification.

The proposed label is based on the European e-Competence Framework and EQAVET, and the overall result is a mechanism that makes it possible to distinguish different types of certification and training, referenced against the e-Competence Framework.

In addition, new access is provided to information and evidence about demand and supply of e-skills in Europe, along with a prototype service and tool to support career development, job placement and recruitment, by giving guidance on certification.

The prototype of an online landscape, self-assessment tool and web portal is offered to stakeholders interested in its further development and enhancement, with a view to creating a fully-fledged service in the job placement, recruitment, e-skills development and certification market.

Results of the study were presented at a conference on 24 January 2013 in Brussels, attended by more than 220 participants. The final report was released in March 2013.

This brochure presents the synthesis of the study results. More comprehensive reports are available in electronic format at: www.eskills-quality.eu.

The e-skills online service and self-assessment tool can be accessed at: www.eskillslandscape.eu
Since the financial crisis began to hit labour markets in 2008, Europe has lost more than 5.6 million jobs. In its Communication “Towards a job-rich recovery”, the European Commission states that recovering this lost ground is only possible if the EU returns to sustained economic growth, which in turn requires European industries and services to retain or regain international competitiveness. In this respect, the capability of industry and services to compete and evolve is becoming increasingly dependent on the innovative and effective use of information and communication technologies (ICT).

The EU e-skills strategy is an important component of the Digital agenda for Europe and the Employment Package to boost competitiveness, productivity and employability of the workforce. Europe needs to ensure that the workforce’s knowledge, skills, competences and inventiveness – including but not limited to ICT professionals – meet the highest global standards, and that they are constantly updated in a process of effective lifelong learning.

Despite high levels of unemployment, shortages of skills continue to increase in the ICT sector. The mismatch between the skills available and the needs of the labour market concern all Member States, even if it affects them to varying degrees. Remarkably, the demand for ICT practitioners is growing by around 3% a year, outstripping the supply. Forecast vacancies by 2015 vary from 300,000 to 800,000, and many of these will remain unfilled unless more is done to attract young people into computing degrees and to retrain unemployed people.

In this context, ICT industry training and certification is clearly an element in the possible solution. But there are barriers to overcome. An ICT practitioner faces an often bewildering range of thousands of certificates, whether starting a career or advancing towards areas of the highest demand. There is a lack of transparency, with a wide diversity of certificates covering the technical training offered by nearly every ICT vendor, foundations in information management, or high-end certificates. Moreover, many of these certificates exist in parallel to - but unrelated with - formal vocational and higher education.

This is the background to the study on “European Quality Labels for ICT Industry Training and Certifications”. This brochure highlights the main results of the study, which were presented to and discussed with European experts in four workshops, and at an international conference which brought together more than 220 key stakeholders and government representatives. The results were widely welcomed, and a broad consensus emerged that a widely-accepted quality label could help bring a new degree of focus to filling the impending skills gap. Discussions among stakeholders on the next steps are taking place in the context of a „Grand Coalition for Digital Jobs” launched on 4-5 March 2013 in Brussels.

Michel Catinat
Head of Unit
Key Enabling Technologies and ICT
Enterprise and Industry Directorate-General
European Commission
Starting a career as ICT practitioner or advancing towards those areas of highest demand is constrained by the fact that the ICT certification world lacks transparency. There are thousands of different certificates, ranging from technical ones (almost every ICT provider offers some) or those offered by foundations in information management, to high-end certificates. Moreover they seem to exist in a parallel universe to that of vocational and higher education.

An ever-increasing number of ICT providers offer thousands of industry-based training and certification courses (IBTC). Not only is there currently no overview or reliable figures on what is available, but there is no comprehensive information on the content of different IBTCs, or how they relate to or overlap with each other.

For ICT practitioners interested in advancing their career, organisations recruiting ICT staff, or young people and students thinking of a career in the ICT domain, this lack of clarity makes it unnecessarily difficult to identify options and take decisions.

Human resources departments face challenges in recruitment, particularly across borders. Curriculum developers are uncertain about how to provide entry points for interested individuals and organisations. But most of all, small and medium size enterprises (SMEs) are impeded in their search for talent, and ICT practitioners desperately need orientation and guidance in taking further career steps.

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The European landscape for ICT industry training and certification

ICT industry-based training and certification can play a major role in reducing e-skills shortages and mismatches in Europe. However, significant inhibitors and constraints will have to be overcome.

“...This initiative fits very well with our mission to improve information management by enabling professionals to develop and certify their competences. As an independent accreditation and certification body, EXIN supports the European e-Competence Framework. The development of internationally recognized quality labels for ICT training and certification will increase the maturity of the ICT sector. It will facilitate the use of industry-based certificates in higher vocational and academic education. Tools making it possible to match e-skills with job roles will be very important.”

Bernd Taselaar
CEO EXIN
The ICT workforce in Europe in 2011 totalled 6.67 million - 3.1% of the overall workforce. 5.25 million are classified as ICT practitioners and 1.42 million can be described as ICT professionals at management level. This includes CIOs, ICT operations managers, project managers, and ICT workers responsible for planning and strategy, such as enterprise architects, systems analysts and ICT consultants.

If the ICT skills of mechanics and manual workers are included, the total rises to more than eight million workers, or 3.7% of the European workforce - and as high as 6% in some countries.

From 2000 to 2010 the ICT workforce grew at an average annual rate of more than 4%. Even throughout the economic and financial crisis affecting Europe since late 2008, growth has averaged 2.65% per year.

What is evident is the job-security of ICT practitioners. The labour market has easily absorbed all ICT graduates and remains hungry for more.

"EuroCIO has been very active for years in the field of e-skills at national and EU level. The CIO community sees well trained people with the right e-skills as "the" key for innovation and the digital transformation of our economy and society at large. EuroCIO endorses the European Commission intention to mature the ICT profession, based upon common standards for e-competences and job-profiles, good education and related European based qualification systems".

Peter Hagedoorn
Secretary-General, European CIO Association (EuroCIO)
ICT workforce development in European countries 2000 - 2010

Interest in ICT education and careers is declining in Europe. The number of computer science graduates has been falling steadily since 2005.

The rate of the decline in ICT graduates is exceeding any forecasts, and threatens to create a dramatic shortfall of skills.

The decrease in the number of entrants to the ICT workforce is coinciding with an increase in exits as ICT practitioners leave the workforce, intensifying the risk of skill shortages.

The UK has suffered the most dramatic fall-off, with the number of graduates in 2009 down to just 62% of the level of 2003. But decreases are generalised in most countries, with the notable exceptions of Germany and the Czech Republic.

Number of computer science graduates in European countries 2000 – 2010

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</tr>
</thead>
<tbody>
<tr>
<td>EU-27</td>
<td>70.976</td>
<td>83.459</td>
<td>91.604</td>
<td>103.343</td>
<td>113.580</td>
<td>123.111</td>
<td>124.999</td>
<td>118.942</td>
<td>119.786</td>
<td>113.929</td>
<td>113.281</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2.328</td>
<td>2.676</td>
<td>2.734</td>
<td>2.741</td>
<td>1.948</td>
<td>1.643</td>
<td>2.133</td>
<td>2.406</td>
<td>2.909</td>
<td>3.047</td>
<td>2.939</td>
</tr>
<tr>
<td>Italy</td>
<td>1.626</td>
<td>1.519</td>
<td>2.423</td>
<td>2.843</td>
<td>3.211</td>
<td>3.459</td>
<td>3.541</td>
<td>3.385</td>
<td>2.933</td>
<td>2.870</td>
<td>2.778</td>
</tr>
</tbody>
</table>

Graduates relative to peak

Source: Eurostat 2013. First degrees of ISCED level 5A and 5B. *: Missing data.
The excess of demand for ICT workers over supply has been repeatedly demonstrated. An empirica survey of CIOs and HR managers in eight European countries in 2012 suggested that there were 255,000 unfilled vacancies across the EU. Of these, some 72,000 were for “ICT management and business architecture” skills and about 183,000 for “Core ICT practitioners” and “Other ICT technicians”. Recent forecasts suggest that the unmet demand could rise by 2015 to between 372,000 and 864,000.

Demand for ICT practitioners and professionals massively exceeded supply in the boom phase of recent years. The current crisis may be temporarily suppressing demand, but demand nonetheless remains high across the EU.

More than two-thirds of the vacancies are in SMEs, which consistently face greater difficulty in meeting their needs for e-skilled professionals than larger organisations.

Demand for ICT workers is likely to increase significantly when the crisis ends, leading to a sudden widening of the e-skills gap.

Vacancies by sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT</td>
<td>44%</td>
</tr>
<tr>
<td>Manufacturing and Construction</td>
<td>28%</td>
</tr>
<tr>
<td>Retail, Wholesale, Transport and Logistics</td>
<td>11%</td>
</tr>
<tr>
<td>Other services (incl. Finance)</td>
<td>13%</td>
</tr>
<tr>
<td>Public Sector</td>
<td>4%</td>
</tr>
</tbody>
</table>

Vacancies for ICT professionals in European countries in 2012 (according to the empirica CIO and HR managers survey, 2012)
e-Skills Quality Labels

John O’Sullivan
CEN expert and Project Manager on ICT Certification in Europe and ICT Certification in Action

“The European e-skills quality label helps learners, their employers and their customers to judge the value of training and certification by relating it to the European e-Competence Framework as the common benchmark. It helps to unite the parallel universes of academic and industry qualifications by bringing both into a single scheme of lifelong learning.”

Vacancies for ICT professionals in European countries in 2012 (according to the empirica CIO and HR managers survey, 2012)

Vacancies by function

- ICT practitioners: 72%
- ICT Management, Architecture and Analysis: 28%

Vacancies by size of enterprise

- 10-249 employees: 70%
- 250+ employees: 30%

Source: empirica: CIO and HR managers survey on e-skills in Europe, 2012
Projections suggest that future demand will increasingly focus on higher-level ICT jobs - management, planning and strategy, and ICT development specialists - and less in the infrastructure-related occupations such as ICT support, delivery and operation.

Empirica research done together with IDC Europe on behalf of the European Commission DG ENTR has shown that by 2015 due to the much higher growth of e-skills demand compared to e-skills supply vacancies in ICT jobs will be between 372,000 and 864,000. Demand for ICT management and architecture level experts are expected to increase steadily as will ICT practitioner demand, however, the latter will be more volatile and dependent on scenario. Unmet demand for e-skills will be high in 2015, and at a level that will be as much as double the number of students graduating in computer science in four years (at 2011 computer science graduates figures).

In an era of pervasive digital technology and globalization, quality standards are more and more crucial. ICT industry-based training and certification will play an increasing strategic role, not only in the ICT sector. Customers, users and citizens demand high quality and value. Quality recognition will be the key to staying in the game and competing.”
Certificates based on IBTC are indispensable for applicants for some ICT vacancies or promotions, according to 30% of HR/CIO respondents (weighted by employment). Another 45% see certification as an important asset. Attitudes to IBTC vary across the EU27, with the UK according it most importance, and with France at the other end of the scale.

Certification levels required differ by work domain. Requirements are highest for IT-security staff, followed by software developers, hardware maintenance, and ICT management.

To bring transparency to the IBTC market, and offer guidance about quality, there is wide support for the creation of a quality label.

European industry insists on the need for an e-skills quality label and accompanying support so that it can identify and select the most suitable certifications for staff. Employees and students interested in career development urgently require appropriate guidance through the confusions of the IBTC market so that they can distinguish high-quality certifications from those of questionable value.

ICT vendors offering certifications are interested in a label that can be recognised as a warranty of their quality. And national and European policy makers responsible for employment and for better matches between demand and supply of skills are also in favour of pathways that can help increase employment rates and the number of ICT workers in Europe.

The need for a European e-skills quality label and associated tools

ICT industry training and certification is considered highly relevant by European human resources managers and CIOs.

"High-quality industry-based training and certification is key to successfully narrowing the e-skills gap in the EU. The proposed European e-skills quality label together with the e-skills online service landscape and self-assessment tool, provide an important step towards making the ICT profession more attractive to students and providing more transparency for prospective employers."
European e-skills quality labels and associated tools

Towards European e-skills quality labels, tools and services bringing transparency and guidance to the training and certifications market.

These quality label proposals and prototype tools

- make it possible to distinguish different types of certification and training, by mapping quality labels and industry-based certification and training courses against the e-Competence Framework and awarding quality labels for IBTC, in line with the European Commission 2009 Recommendation on a European Quality Assurance Reference Framework for Vocational Training and Education (EQAVET);
- offer information and evidence about demand and supply of e-skills in Europe through an online landscape service, providing an overview of areas with high demand for e-skills, thus promoting a better match between e-skills demand and supply.
- provide a prototype, through an online self-assessment tool and web portal, for focused further development and certification of one’s own e-skills, or those of staff, to support better job placement and recruitment in companies.

“...This initiative provides the means to distinguish different types of certification and training by quality labels and industry training courses and certifications mapped against the European e-Competence Framework. It encourages stakeholders to monitor training quality and allows employees to compose their own professional profile based on education, experience, certificates and competences. Industry will benefit from improved transparency in the labour market in Europe.”

Carsten Johnson
Cisco Systems, Area Academy Manager
Proposals for IBTC quality labels have been developed to be compatible with the EC 2009 Recommendation on a European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET).

The focus is on the acquisition and the development of e-skills for ICT practitioners, i.e. the skills required for conceiving, deploying and maintaining ICT systems, rather than the skills needed by people using existing ICT tools in work processes. SME requirements have been taken particularly into account.

The proposals build on the achievements of the ICT Skills Workshop of the European Standardisation Committee (CEN), and in particular the mapping of courses from leading e-skills IBTC providers against the European e-Competence Framework (e-CF).

The proposed European e-skills quality label builds on three elements: criteria and indicators; processes; and organisational structures.

Developing and implementing the proposed European quality label for IBTC should be based on clarity over:

1. **Criteria and indicators** to define and measure quality
2. **Processes** for awarding quality labels, from initial application through to renewal
3. **Organisational structures** that identify players with the motivation and capacity to manage and participate in the proposed scheme, because they
   - are convinced that it is useful;
   - are attracted by a reasonable financial model;
   - have the resources and staff capabilities.

“..."
A quality system depends on defined parameters and components, and on clarity about the requirements and outcomes, i.e. what does an ICT professional (or an organisation paying for an educational program) expect, and from whom? The course content and the target audience must be clear in advance, so that students can be confident it is what they want before they enrol. The learning experience must be positive, with materials and delivery that are effective and engage the student. At the end of a course the outcome should reflect the stated objectives of the course or programme, so that students’ expectations are met. And the overall quality of the materials, tutors, environment and the learning outcome must be worth the expense, since students and/or purchasers of education and training want value for money.

Quality label development has therefore taken into account the customer perspective. On programme contents, the key questions are:

- What is the exam/training about, in terms of learning outcomes
- Does it cover what it claims
- Where is it located in the IBTC landscape
- Are learning outcomes state of the art
- How does it fit in a career plan
- How vendor-specific is it
- Are examinations and certifications in line with international standards

On training provision, the questions are:

- What is the quality of teachers/trainers
- What is the quality of technical means
- How is accessibility provided
- Does testing comply with standards
- How are data safety and data protection handled

The software industry in Eastern Europe is steadily growing. Continuous qualification improvement requires validated training paths for desired roles and credible certifications. Based on the European e-Competence Framework, the European quality label will fill the gap in the ‘education and lifelong learning-sector’ – of key importance to scale-up SMEs in the region and to define industry requirements for modern IT and software qualification.”

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The concept illustrated below of a dual channel quality label structure recognizes that two key elements should be monitored and assessed, and, if these are found to be satisfactory, recognition should be given.

Proposed dual e-skills quality label award structure

The principle followed in developing the quality label is a dual-channel structure.

Accordingly two types of quality labels have been proposed, to recognize either or both:

- The quality labels must meet expectations
- The education institution must meet expectations
- The education program must meet expectations

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The proposed quality label incorporates a set of criteria that are summarized in the following table:

### Proposed e-skills quality label criteria

#### Criteria for Institution

- **EI1** Delivery quality and the quality of teachers and trainers
- **EI2** Technical quality of learning environment
- **EI3** Accessibility
- **EI4** Examination/certification delivery (if applicable)
- **EI5** Institutional quality assurance
- **EI6** Safety & data protection
- **EI7** Support services

#### Criteria for Programme

- **P1** Link to e-CF as the recognized framework
- **P2** Programme development
- **P3** Programme revision and improvement
- **P4** Content applicability (when appropriate)
- **P5** Examination/certification (if applicable)
- **P6** Customer-oriented communication

### Mapping against the European e-Competence Framework

The mapping of industry-based e-skills certifications against the European e-Competence Framework (e-CF) will make the label clearer for:

- ICT-professionals looking for training and certification to improve their skills and widen their career options,
- organisations hiring staff (especially small and medium sized enterprises),
- consultants with specific e-skills, training providers and certification bodies developing e-skills education programmes or preparation for specific job roles,
- employment and recruitment agencies and the staffing industry.

The mapping of e-skills certification against the e-CF could generate a further service.

“ICT certification and training offerings need to adhere to common quality standards as an integral part of a fertile ecosystem offering respective training and qualifications for the ICT profession in Europe. A flexible system based on e-skills quality standards will achieve broad recognition, create mutual benefit and offer appealing prospects to start a career in ICT.”

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**Prof. Dr. Peter Weiß**
Service Operations Management, ISS Business School
The concept of an ‘online e-skills landscape service and self-assessment tool’, described below, could provide up-to-date information on IBTC, based on the contribution of certification providers. This would meet an urgent need for support in navigating through the e-skills certification landscape for ICT practitioners and employers. The database with the results of the mapping would also be an important element of the self-assessment tool.

The approach developed in the study is a prototype of a common framework, exploring the feasibility of the procedure and its use in the self-assessment tool.

It takes into account the ICT-related roles in organisations for which certificates may be relevant, comparing the e-competence ‘profile’ of the certifications with the European ICT-Profiles (CEN Workshop Agreement 16458 of the CEN ICT Skills Workshop). A mapping method, together with suggested rules and templates, are provided in a handbook.

A two-tier management structure is proposed, for the strategic and operational management and as a governance model.

It is emphasised that the following architecture is no more than a proposal for discussion. Other routes could be followed to attain the same objectives. The current proposal envisages a strategic governance board of influential directors from across the range of stakeholders, including higher education, vocational education, training providers, ICT vendors, the European Commission, and ICT demand industries. Broad representation will help to ensure that the perspectives of all ICT development interested parties are taken into account. The key motivation would be shared interests in increased transparency and evidence of quality in the European e-skills landscape.

An early task would be to design a tender document for the selection and appointment of national organisations to manage the scheme. Requirements would be defined of practical experience and process capacities in the field of Quality Assurance (e.g. 5 years of experience in awarding recognized Quality Assurance certificates, although not necessarily in ICT), and capacity for reliable networking among experts who would be recruited for the technical assessment.

Board members nominated should be acceptable to the range of relevant e-skills players. The process should be observed and accompanied by the European Commission. Nomination and acceptance arrangements should incur no public costs. Operating costs should be reimbursed through standardised allowances, with the costs covered by income from fees paid by applicants under the quality label awarding process.

This two-tier structure would provide a balance between the reliability and ethics of the scheme and the benefits of commercially oriented management. An outline proposal for an initial distribution of responsibilities is offered in the diagram next page.
For the operation of the entire chain, including application, assessment, award, communication and renewal, the following table suggests the processes, actors, methods, and required effort.

- **Applicants for the label** would be IBTC providers (training providers, vocational colleges or universities), or developers and providers of course, qualification or certification.

- **The managing body** would consist of one or more institutions experienced in Quality Assurance at national level (such as Dekra or Cert-IT), and/or a central organisation responsible for global programmes.

- **The governance board** would have a balanced composition at EU level (including, for instance, the European e-Skills Association, the European CIO Association, CIONET, CEPIS, CEN ICT Skills Workshop, a joint proposal by ICT vendor companies, and the European Association for ICT in Higher Education).

### Proposed management structure for the e-skills quality label

<table>
<thead>
<tr>
<th>QL Governance Board</th>
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<tbody>
<tr>
<td>Governance structure</td>
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<tr>
<td>Overall approval of quality systems</td>
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<td>Pricing structure</td>
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<td>Awarding approval</td>
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<tr>
<td>Cancelation approval</td>
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<tr>
<td>Awarding criteria</td>
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<tr>
<th>QL Management Organisation</th>
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<tbody>
<tr>
<td>Assessment of quality systems</td>
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<td>Assessment of education programs</td>
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<tr>
<td>Feedback mechanism</td>
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<tr>
<td>Dispute resolution</td>
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<tr>
<td>Information base management</td>
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<tr>
<td>Cancelation proposals</td>
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<tr>
<td>Awarding recommendations</td>
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<td>Marketing and promotion</td>
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<table>
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<tr>
<th>QL Applicant</th>
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<tr>
<td>Application on fee Provision of evidence</td>
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</table>

“Common competence and qualification frameworks and standards like the European e-Competence Framework are a prerequisite for the achievement of the goal of a European labour market with higher levels of mobility. IG Metall has been active for years in the EU e-skills strategy and the development of vendor-independent ICT training and certification (APO-IT). We need bridges between formal education and ICT vendor certification systems. IG Metall joined forces with Cisco, enabling employees to achieve a double qualification with the offer ‘Cisco meets APO’.”

Mapping against the European e-Competence Framework is a major criterion for the quality label.

For the operation of the entire chain, including application, assessment, award, communication and renewal, the following table suggests the processes, actors, methods, and required effort.
## Proposed award processes for the e-skills quality label

<table>
<thead>
<tr>
<th>Process</th>
<th>Sub-process</th>
<th>Who does it?</th>
<th>Method</th>
<th>Effort required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-work to ensure overall consistency and efficiency of processes</strong></td>
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<tr>
<td>Pre-work Quality systems assessment (for institution)</td>
<td>Agreement on a catalogue of recognised QS (EU-level and country system dependent)</td>
<td>External experts contracted by QL Governance Board</td>
<td>Systematic research and development of such a catalogue prior to QL operational start</td>
<td>Upfront cost</td>
</tr>
<tr>
<td>Pre-work Educational programs assessment (for program)</td>
<td>Development of a more detailed template to ensure consistent methodological approach in description and e-CF mapping</td>
<td>External experts contracted by QL Governance Board</td>
<td>Systematic research and development of such a template prior to QL operational start</td>
<td>Upfront cost</td>
</tr>
<tr>
<td><strong>Assessment of quality systems of the applying institution</strong></td>
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<td></td>
</tr>
<tr>
<td>Application</td>
<td>Provide evidence that the institution is recognized</td>
<td>QL applicant</td>
<td>Documentation provision – electronically or by post</td>
<td>Depending on applicant</td>
</tr>
<tr>
<td>Assessment</td>
<td>Review of documentation provided</td>
<td>QL managing body</td>
<td>Documentation review – desktop work</td>
<td>1.5 hours</td>
</tr>
<tr>
<td>Recommendation to QL Governance Board</td>
<td>QL managing body</td>
<td>Standardised template</td>
<td>15 minutes</td>
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</tr>
<tr>
<td>Rejection or approval</td>
<td>QL Governance Board based on recommendation by QL managing body</td>
<td>QL managing body</td>
<td>Depending on process organization</td>
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<tr>
<td><strong>Awarding</strong></td>
<td>Awarding recommendations</td>
<td>QL managing body – internal</td>
<td>Standardised template</td>
<td>15 minutes per case</td>
</tr>
<tr>
<td>Awarding approval</td>
<td>QL governance board</td>
<td></td>
<td>Depending on process organization</td>
<td></td>
</tr>
<tr>
<td>Dispute resolution</td>
<td>QL managing body - internal</td>
<td></td>
<td>Depending on case</td>
<td></td>
</tr>
<tr>
<td>Information base management</td>
<td>QL managing body - internal</td>
<td></td>
<td>15 minutes per case</td>
<td></td>
</tr>
<tr>
<td>Cancellation proposals</td>
<td>QL managing body - internal</td>
<td></td>
<td>Depending on case</td>
<td></td>
</tr>
<tr>
<td>Marketing and promotion</td>
<td>QL managing body - internal</td>
<td>Multiple channels</td>
<td>Ongoing effort, depending on QL managing body</td>
<td></td>
</tr>
<tr>
<td><strong>Assessment of education program</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application</td>
<td>a) Provide evidence of articulated learning outcomes</td>
<td>QL applicant</td>
<td>Documentation provision – electronically and by post</td>
<td>Depending on applicant</td>
</tr>
<tr>
<td></td>
<td>b) Provide evidence of relevance of material compared to the course description</td>
<td>QL applicant</td>
<td>Documentation provision – electronically and by post</td>
<td>Depending on applicant</td>
</tr>
<tr>
<td></td>
<td>c) Provide evidence of continuous revision and improvement process</td>
<td>QL applicant</td>
<td>Documentation provision – electronically and by post</td>
<td>Depending on applicant</td>
</tr>
</tbody>
</table>
### Proposed award processes for the e-skills quality label

<table>
<thead>
<tr>
<th>Process</th>
<th>Sub-process</th>
<th>Who does it?</th>
<th>Method</th>
<th>Effort required</th>
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<tbody>
<tr>
<td>d) Provide evidence of precise pre course information</td>
<td>QL applicant</td>
<td>Documentation provision – electronically and by post</td>
<td>Depending on applicant</td>
<td></td>
</tr>
<tr>
<td>e) Provide evidence of e-CF reference</td>
<td>QL applicant</td>
<td>Documentation provision – electronically and by post</td>
<td>Depending on applicant</td>
<td></td>
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<tr>
<td>Assessment</td>
<td>Review of c)</td>
<td>QL managing body - internal</td>
<td>Desktop work</td>
<td>0.5 hour</td>
</tr>
<tr>
<td></td>
<td>Review of a), b), d) and e)</td>
<td>QL managing body – external expert</td>
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<td>3 hours</td>
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<tr>
<td>Awarding</td>
<td>Awarding recommendations</td>
<td>QL managing body - internal</td>
<td>Standardized template</td>
<td>15 minutes per case</td>
</tr>
<tr>
<td></td>
<td>Awarding approval</td>
<td>QL governance board</td>
<td></td>
<td>Depending on process organization</td>
</tr>
<tr>
<td>Communication and other issues</td>
<td>Dispute resolution</td>
<td>QL managing body - internal</td>
<td></td>
<td>Depending on case</td>
</tr>
<tr>
<td></td>
<td>Information base management</td>
<td>QL managing body - internal</td>
<td>On-line database</td>
<td>15 minutes per case</td>
</tr>
<tr>
<td></td>
<td>Cancellation proposals</td>
<td>QL managing body - internal</td>
<td></td>
<td>Depending on case</td>
</tr>
<tr>
<td></td>
<td>Marketing and promotion</td>
<td>QL managing body - internal</td>
<td>Multiple channels</td>
<td>Ongoing effort, depending on QL managing body</td>
</tr>
<tr>
<td>Renewal</td>
<td>Provide evidence that QL requirements are still met</td>
<td>QL applicant</td>
<td></td>
<td>Depending on applicant</td>
</tr>
<tr>
<td></td>
<td>Review of evidence documentation</td>
<td>QL managing body – internal or external</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Renewal recommendations</td>
<td>QL managing body - internal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Renewal approval</td>
<td>QL governance board</td>
<td></td>
<td>Depending on process organisation</td>
</tr>
</tbody>
</table>
The e-skills online landscape and self-assessment tool

The e-skills Landscape Service (www.e-skillslandscape.eu) is a prototype of a tool based on the European e-Competence Framework and on the CEN ICT Profiles and the mapping of ICT industry certificates against both of these.

The objectives of a proposed online service around this prototype tool can be summarized as:

- Offering transparency in the IBTC landscape
- Providing information on supply and demand
- Bringing together the community of stakeholders and experts.

The prototype web portal provides information on the:

- European e-Competence Framework
- European ICT professional profiles
- e-skills quality labels
- e-skills quality label project
- e-skills demand and supply, including a statistics section
- industry-based certification profiles.

It also includes:

- a simple training finder
- a self-assessment tool
- an e-skills quality community section with a forum and a wiki.
The self-assessment tool is a key component of the online landscape service, as it provides the means to distinguish different types of training and certifications by reference to quality labels.

The other tool which stakeholders may wish to develop, based on the existing prototype, will put new abilities into the hands of employees and of organisations managing recruiting and promotion. They will be able to compose their own or specific professional profiles, based on education, experience, certificates and competences. From this they can find the best matching ICT profiles, and choose the certificates that could help them to meet their aspirations. The tool could prove influential in attracting people into the ICT sector, by offering a clear guide to help match competences, experiences etc. with jobs, and an indication of the steps required to attain identified targets.

The prototype tool works on the basis of the following input / data fields to compute a personal professional profile:

- **Personal data** (name, occupation, education, nationality...)
- **Experience** (based on the ICT profiles)
  - Contributing: contributors provide input before work can be completed and signed-off. They are active participants “in the loop”. Several people can be contributors to one deliverable.
  - Responsible: the “doers” of the work are responsible for it. They must fulfil the task or objective or make the decision. Several people can be jointly responsible for one deliverable.
  - Accountable: to be accountable is to be the only “owner” of the work. The owner must sign off or approve when the task, objective or decision is complete. He/she must make sure that responsibilities are assigned for all related activities. There is only one owner accountable for each deliverable.
- **Competences**
- **Certificates** obtained.

An ICT professional or practitioner can use the tool to:

- discover personal competences based on experience and certification,
- input directly any additional competences;
- explore what competences and experience would improve performance, or
- identify certificates that could improve perceptions of competence with respect to a particular ICT job profile, for instance.

Companies’ recruitment or career development and promotion processes could benefit from the self-assessment tool for profiling existing staff members (according to competences, experiences, certificates) and for identifying optimal paths for advancing careers and setting targets.

Employment agencies and recruitment / staffing industry operators could benefit by asking their candidates to make a self-assessment when applying for a new position.

Based on the input of certificates, experience and competences, best-fit roles are computed, based on the CEN ICT professional job profiles, with a personal score indicating what percentage of a set of required competences is already covered.

A gap analysis allows indications of different possible certification paths and/ or job experiences to acquire the profile for the targeted job.

A matching algorithm makes it possible to compute the relationship between the input for the self-assessment and the personal professional profile, the ICT profiles and the certification profiles in the database.
e-Skills Quality Labels

“…We fully support the idea of a quality label in order to clearly identify high-quality industry-based training and certification in accordance with the European e-Competence Framework.”

Thomas Michel
FBCS, CEO Cert-IT

“ECDL Foundation strongly believes that a structure such as that proposed by the e-skills Quality project will be of direct benefit both to practitioners and organisations, as they navigate through a complex environment of training and certification solutions. This project will set benchmarks for quality, but will simultaneously be flexible enough to accommodate variety and innovation in industry-based training and certification.”

Frank Mockler
Head of Programme Standards, ECDL Foundation – Dublin
The proposed set of services and tools could create urgently needed transparency and support tools to help match individuals’ competences and experience with companies’ recruitment and staff promotion processes. The web-portal could also provide comprehensive statistics of supply and demand for e-skills industry-based training and certification across Europe. The mechanisms envisaged would provide interested parties with an assurance that the certifications that are awarded the quality label are guaranteed to meet relevant standards and fulfill relevant quality criteria. In addition, only those industry-based e-skills certifications that had been awarded the European e-skills quality label would qualify to appear in the e-skills online service landscape and self-assessment tool.

To offer these prototypes as services in the market, a European multi-stakeholder partnership of key actors is needed. The services offered should build on the e-CF and could include the following tasks and activities:

- e-CF promotion in the European and global market;
- Mapping of industry-based ICT certification to the e-CF;
- Issuing and awarding the European e-skills quality label for certifications;
- Offering an e-skills online landscape and self-assessment tool (eLS), built on a common e-Competence framework;
- Assisting Europe’s industry in processes of staff recruitment, skills upgrading and internal promotion;
- Helping ICT practitioners advance their careers and upgrade their skills in line with industry demand;
- Allowing pupils and students to compare their expectations, experiences, competencies and educational skills to specific ICT job profiles;
- Helping employment agencies and recruitment and staffing consultancies in job placement;
- Helping individuals profile themselves and their skills and competences and map these against market demand on the basis of a common competence framework.
- Further development and maintenance of the European e-Competence Framework (e-CF);
- Further customised services in response to specific requests.

It is recommended that the partnership should be established in such a way that:

- all e-skills services that it offers are built on the e-CF (and the associated ICT professional profiles);
- e-skills quality labels are awarded only to those IBTCs which fulfill the specified criteria (including successful (and audited) mapping against the e-CF);
- only those audited IBTCs may be included in the definitive online self-assessment tool.
Concerted action and partnership among key stakeholders would be necessary to establish management and governance structures.

The result would be to attract more people to become ICT practitioners and professionals, help them to up-skill themselves, and further advance their careers to match the e-skills and e-leadership skills increasingly demanded by industry. Companies in the sector, as well as employment agencies and the recruitment / staffing industry, also stand to benefit in their own recruitment and job placement processes.

Europe’s industry should be asked to build on the European e-Competence Framework (e-CF) when recruiting or promoting employees. This can provide the European bridge across national and corporate frameworks, by describing professional ICT-related skills in terms of competences and levels that can be understood across the whole of Europe, and may also be promoted and used internationally too.

For discussion: a multi-stakeholder partnership might be established as a two-tier model, with a governance layer and an executive layer, supplemented by a network of national stakeholders.

Actors might include:
- Industry (e-skills demand side) and ICT training and certifications companies (e-skills supply side)
- European ICT associations (e.g. CEPIS, DIGITALEUROPE)
- Education and VET sector and vendor-independent certification and examination institutions
- National employment agencies
- Actors from staffing and recruitment industry etc.
- Accredited national stakeholders for e-skills quality label awarding.

Starting as a non-profit organisation, it would require sufficient revenue streams to become sustainable. Income sources could include:
1. Membership fees
2. e-CF mapping service or auditing of e-CF mapping results from ICT vendors
3. The award of e-skills quality labels through national partner bodies
4. Service projects for own members, national governments, key stakeholders, European Commission, CEN
5. EC funding through CEN for specific tasks such as further development of e-CF
6. Fees from licensing the self-assessment tool to employment agencies, staffing industry actors and large corporations for their internal use.

“This initiative provides the means to distinguish different types of certification and training by quality labels and industry-based certification and training courses mapped against the European e-Competence Framework. In working with this initiative, Microsoft can develop a pipeline of talent with a clearly demonstrable career pathway so that individuals can reach their potential.”

Kevin Marshall
Head of Education, Microsoft Ireland

**e-Skills Quality Labels**
The above figure should be seen as a proposal and provides an overview and illustration of possible major building blocks and how these might relate to each other.

The European Commission could play a role in this model by providing support for the further development of the e-CF and related services through the CEN mechanism.

Signs of a concerted campaign to tackle the shortfall of e-skills emerged at a conference in Brussels on January 24, 2013. This brought together representatives of industry, ICT vendors, the education sector, independent certification and examination institutions, national employment agencies and the staffing industry, as well as officials from the four relevant European Commission’s DGs: Enterprise and Industry, Education and Culture, Employment and Social Affairs and Communications Networks, Content and Technology.

There was an agreement in principle to develop e-skills quality labels, tools and services that could boost employment and employability in Europe. Experts from the sectors facing the challenge agreed that a quality label for ICT industry training and certification could help bring transparency to the current complexity of offers from distinct providers. It could also promote mobility among ICT professionals, and attract new pools of talent into the ICT profession.

The consequence could be a rapid reduction in skills shortages - an urgent development if the current mismatch of ICT skills and ICT demand is to be met, and an even more critical shortfall hits the EU from 2015.

Consensus emerged that a widely-accepted quality label could help bring a new degree of focus to filling the impending skills gap. It would be based on the European e-Competence Framework (e-CF) developed by the European Committee on Standardisation (CEN), and together with an online self-assessment tool would offer guidance in a complex ICT certification landscape, aiding the development of clear career pathways in ICT and bringing a new and sharper profile to ICT professionals.

Discussions among stakeholders have started on the next steps, in the context of a Grand Coalition for Digital Jobs, which was officially launched on 4-5 March 2013 in Brussels.
This study was commissioned by the European Commission DG Enterprise and Industry. André Richier, Principal Administrator, Unit Key Enabling Technologies and ICT, was our contact point throughout the study. The project would not have been possible without the generous participation of many experts especially Jutta Breyer (Breyer public), Terry Hook (Clock-IT-Skills) but also Fabianne Ruggier and Daniela Busuttil Dougall (Talent Consulting), Clementina Marinoni (Fondazione Politecnico die Milano), Fiona Fanning (CEPIS), Dudley Dolan (Chair of CEN Workshop on e-Skills), Frank Mockler (ECDL), Roberto Bellini (AICA) and Andrea Parola (European e-Skills Association).

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We would also and specifically like to acknowledge the valuable insight we were able to gather through over more than 100 interviews with experts and practitioners and different online surveys of more than 220 experts. We are grateful to the many professionals who took the time to share their views.
Contact Information
For further information and to request copies of this brochure, please contact:
European Commission
Enterprise and Industry Directorate-General
Unit D4 “Key Enabling Technologies and ICT”
1040 Brussels, Belgium
Fax: (32-2) 2967019
e-Mail: ENTR-KET-AND-ICT@ec.europa.eu

empirica GmbH
Oxfordstr. 2 · 53111 Bonn, Germany
e-Mail: info@empirica.com · Web: www.eskills-quality.eu
Study together with:

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