Brussels, January 8th 2008

CEN/ISSS Workshop ICT-SKILLS
ICT-Certification in Europe

OPEN CALL FOR PROJECT TEAM EXPERTS

The "ICT-Certification in Europe" project of the CEN Workshop on ICT-Skills has received EC/EFTA funding in the context of the 2007 ICT Standardization Work Programme. The project aims to overlook the market of ICT skills certification for ICT professionals in Europe and beyond, and will compare the different products by means of underlying certification schemes and curricula as well as clarifying the objectives and principles of certification products. The approach chosen is to concentrate on the offerings for ICT professionals (or practitioners) and on specific ICT sectors of significance for industry.

Through this call for Project Team experts, CEN invites applications from experts who would like to work as a member of this Project Team. (Project Teams are, in CEN/ISSS's terminology, small teams of paid experts who execute specific tasks under the direction of a Workshop.) As described in the technical proposal, a Project Team composed of 1 project leader and 2 executive experts is required.

The Terms of Reference (ToR) of the Project Team are attached in **Annex I**. These ToR describe in more detail what is expected from this Project Team. The criteria for selection are in section 9 of these ToR.

In **Annex II**, you will find attached the rules for the setting up and functioning of Project Teams in CEN/ISSS. In line with these CEN/ISSS general rules on the selection and appointment of the Project Team experts, the selection will be made by a selection panel whose composition for this Project Team will be

- Geoff Mc Mullen, the Workshop Chair,
- Antonio Herrera and Hubert Delafon, the Workshop vice-chairs
- Luc Van den Berghe as representative of the CEN Secretary-General,
- and Valerie Bertrand from AFNOR who is the Workshop Secretary.

It is intended that the outcome of the selection process will be communicated to the next meeting of the ICT-Skills Workshop which is planned on 14th February in Brussels.

The reimbursement rate for accepted experts is 650 €/person day. Travel and lodging costs incurred in the context of this project are however not reimbursed. It is expected that a considerable part of the work can happen electronically.

Payments to Project Team experts are dependent on CEN having received the corresponding payments by the European Commission. In this particular case, the payment steps are: 20% upon signature, 30% at acceptance by EC of the Interim Report and the 50% remaining at the EC approval of the Final Report. Applicants have to know that the delay before CEN being in a position to issue the final payment may be in the order of several months.

Interested candidate experts are kindly requested to send their nominations by 9 February 2008, to Luc Van den Berghe, Unit Manager at the CEN Pre-Standards Department (luc.vandenberghe@cen.eu). Preferred method is by email, including a short Curriculum Vitae, and clarifying whether the application is to become project team leader or project expert.

Please note that companies can nominate their personnel, and also any individual may apply as a candidate expert (self-employed CONTRACTORS-EXPERTS: see **Annex III**).

I look forward to receiving your applications.

Yours sincerely,
Luc Van den Berghe, Unit Manager PSD

Annex I

Terms of Reference for a Project Team on ICT-Certification in Europe

The Project Team will report to the Workshop on ICT-Skills
(the "reference authority")

1. Objective

The overall goal of this project is set by the recommendations documented in the CEN Workshop Agreement "ICT Skills Meta Framework" (CWA 15515:2006) and targeted activities specified in the actual CEN/ISSS ICT Skills Workshop (WS-ICT-Skills) business plan:

- **To organise an initiative developing an approach and concept for ICT certification for ICT practitioners in Europe**
- **on basis of applied reference models and systems to be identified and conceptualised by field experts with the aim**
- **to gain and to strengthen broader recognition of ICT certification products across Europe and beyond.**

In Europe individuals face problems actually to demonstrate their knowledge, skills and competencies (KSC) on the labour market. This hampers individuals' flexibility to respond to the own preferences for their individual career development and the fast changing requirements and required general mobility on the labour market.

Companies face the need to respond to the shortening of technology life-cycles in ICT and the accompanying obsolescence of related knowledge, skills and competences (KSC) of their employees. Hence, **flexibility and agility** is required more than ever from companies, ICT workforce, respectively, and the labour market itself. In the past, **ICT certification** has demonstrated its importance evolving in response to changing market and technology needs, and to develop clearer value propositions for employers.

More than ever, qualified people with the right ICT skills[1] are needed. The availability of ICT skills could be likely seen as the key to success to exploit the given huge potential of ICT. Besides, there is an identifiable need of industry **to enhance its productivity** and to reinforce human resources within companies in order to stay competitive and to deploy new market opportunities. Another crucial task for industry is to develop performance standards to be able to allocate the right people with needed ICT skills and to align them to the right projects, jobs and tasks. Certifications offer such performance standards, if recognised and transparent to employers.

Furthermore, certification of persons as a concept appears to be an appropriate mean to increase the **mobility** of the ICT workforce in Europe. From another perspective, certification programmes might become an integral part of individual's professional development. In general, ICT certification increases **employability** of individuals provided that awarded credentials are recognised by employers as valid qualifications.

[1] In the following, the concept ICT skills is applied in this document for purpose of simplification, but summarises the broader concept KSC: ICT knowledge, skills and competences.

Currently, a multitude of offerings and products do exist and a proliferation of job titles and roles can be observed. As a matter of fact, the certification market is actually difficult to overview due to significant variety and diversity of ICT skills certification products for ICT practitioners on the market. This is likely to be the reason why certification of ICT practitioners posses a mixed reputation and in some cases have resulted to their devaluation for employers and many other people in the technology field.

Against this background, the following central questions arise, to be specifically looked into in the scope of this project:

- **Why are there so many certifications?**
- **And why is their number increasing?**
- **What is their role in the context of individual's ICT competence development and lifelong learning?**

For its broader acceptance, ICT certification needs to gain first and foremost the broader recognition through employers and academia. An appropriate way is likely to agree on reference models that are founded on common principles and agreed procedures of ICT certification in Europe and beyond. This encompasses all elements and components of certification system.[2]

The overall aim of this initiative is hence to overlook, analyse and structure what is available. Accordingly, the project will elaborate a **map of the ICT skills certification landscape and market** that helps people to better **navigate on it**. The map has to assist individuals to compare and to choose from the various offerings what fits best their individual purposes and needs.

The project aims to explore the actual landscape of certification systems. It is looked at the ICT training and certification market. The goal is to condense applied **reference models** based on a sound analysis of state-of-the-art approaches. This will be achieved by clarifying underlying processes, principles and methods. Thereby, no high-level scientific exercise is envisaged. The project endorses rather a **pragmatic approach** that takes clear focus on what can be made to work. Nevertheless, profound expert knowledge from different background and expertise might be required to touch this **complex area**.

In general, non-formal ICT certification seems broadly recognised by industry. However, the offered "**value" of certification** systems for the Human Resource domain has to be captured and needs to be further explored. Therefore, it is looked at how ICT certifications are likely to be integrated into human resource processes. Furthermore, it is analysed how public endorsement could be leveraged. In this way, the initiative aspires to explore and describe factors that significantly influence the **degree of recognition** of systems. Thus, the following objectives are derived :

The overall goal of this project is to gain and to strengthen the general **awareness** and **recognition** of ICT professional certification in Europe. In this sense, the project strives for their higher reputation.

Hence, the project involves field experts from different professional background. The project links to actual initiatives and networks.

The consortium is selected to fulfil the need to involve all necessary stakeholders to achieve aspired consensus about future quality measures, namely ICT training and certification industry, academia, user industry, professional associations and national public authorities.

Consequently, the existence of a document issued by a recognised standardisation body (e.g. in form of a CEN Workshop Agreement (**CWA) published by CEN**) would set clear targets for

[2] Please see publication "ICT Certification in Europe", published and issued by Cedefop, 2006.

vendors and suppliers of certification to leverage the reputation and recognition of their systems in Europe and beyond.

The work towards a CWA requires beforehand scrutinising and answering the following questions by the project team:

- What is and defines the "**value"** of a certification/qualification?
- What is the offered "**value"** by certification and for whom?
- What are the **origins of "value"** (direct and indirect) for public and private qualifications?
- What are the **individuals' perspectives**?
- What are **employers' perspectives**?
- What are the interests of different stakeholders?

Important to mention here, to measure an absolute value offered through certification programmes is likely difficult, and maybe impossible. What can be measured is rather **relevance** in the sense of "competences required by the market". To achieve the outlined objective the following project activity is planned:

Project Activity:

The goal is to overlook the **market of ICT skills certification for ICT professionals** in Europe and beyond.

The project aims to compare the different products by means of underlying certification schemes and curricula as well as clarifying the objectives and principles of certification products.

The approach chosen is to concentrate on the offerings for **ICT professionals** (or practitioners) and on **specific ICT sectors** of significance for industry (see (CertCities, 2007), (Tittel, 2006) as e.g.:

- cyber security,
- web-based information systems (web application engineering, web services, portals) and RFID.

The aim of this task is to better understand the nature, characteristics and existing differences between the applied certification models. ICT certification offerings can be grouped into certifications related to main ICT technology vendors, namely ICT industry and those related to independent certification bodies (e.g. professional associations, public bodies, etc.).

Besides, the activity looks at the **ECDL experience** addressing the user level.

The project addresses primarily the **professional and/or practitioner level**.

Hence, we are concentrating in the following on ICT professional certification.

The project draws further from the outcomes and contributions of the CEN/ISSS Workshop on ICT Skills Phase 3, the European e-Skills Forum and its follow-up activities, Leonardo-da-Vinci co-funded projects “EURO ICT-LANE” (http://www.ict-lane.eu) and “HARMONISE project” (http://www.cepis-harmonise.org).

The project will be further link to other European initiatives and activities as EUROPASS (http://europass.cedefop.europa.eu/).

The project aims to assess available resources from the respective **Virtual Communities** of Cedefop, namely “European e-Skills Forum”, “CEN/ISSS WS ICT Skills”, “Quality Assurance” and “Credit Transfer”. It will communicate made achievements and yielded results into the relevant expert communities. The project tends to produce short technical papers and presentations to contribute to relevant events.

The working group starts besides with the preparatory work for the future implementation of an aspired European ICT certification portal and quality framework for ICT certification by exploiting of achievements and results.

2. Rationale

The project is embedded into the **CEN/ISSS ICT Skills Workshop (WS-ICT-Skills) Phase 3** and reinforces the workshop objectives, business plan and is based on previous and connected deliverables from the previous phases of the workshop, namely CWA 14925:2004, CWA 15005:2004, CWA 15515:2006.

The Certification Market :
Adelman (2000) looked at ICT certifications as a new evolving credentialing system in the U.S. He observes a “[…] new system of credentialing that has arisen in the information technology and telecommunications industries over the past decade.”

Multiple certification programmes and systems are known in the ICT industries and other fields of application throughout Europe. Certification and quality standards in ICT education and training are extremely important for both employments in the ICT labour market and as a basis for a sustainable professional career.

Third-party (independent) computer certification has become a '**hot topic**,' and there is a variety – some authors speak of an “alphabet soup” or “jungle” - of ICT certifications that are currently available.

Investigations of the HARMONISE project (http://www.cepis-harmonise.org) have resulted in a list of ICT Skills certifications (foremost ICT vendor certifications for ICT professionals) on the market.

The estimates concerning the number of ICT certifications available are varying and are diverging. However, it can be clearly stated, that there is generally consensus that there are far too many turning the actual market into a “jungle”. Adelman (2000) mentions that both corporate vendors and industry/professional associations have created over 300 discrete certifications since the first such credential (Certified Novell Engineer, or CNE) was issued in 1989. Recent figures estimate that there are more than 850 certifications and more than 200 certification programs to be counted in today’s IT certification landscape (Tittel, 2006).

Accordingly, it is difficult to distinguish “[…] good ones from mediocre or bad ones, winners from losers and up-and-comers from programs in their declining phase” (Tittel, 2006). For individuals this means that it is difficult to overlook the current market and to choose the right credentialing system from what is actually offered. **So, there is a need for guidance.** The marketplace has to be analysed. However, it is difficult and time consuming for individuals to plough through the numerous interest, salary and popularity surveys to try to figure out the right product for themselves. Experts remind that it is also important to pay attention to job advertisements to

determine where likely is need and gap of qualified ICT professionals on the labour market (Tittel, 2006).

If the current situation on the ICT professional certification market is overviewed, the following main categories/groups of ICT professional certification systems can be identified:

ICT professional certifications offered through

1) ICT vendors (industry or product-related certifications),
2) vendor-neutral organisations
3) vendor-independent organisations
4) vendor collaborative associations
5) professional associations, and last but not least,
6) government agencies.

Approximately 1.6 million individuals worldwide earned approximately 2.4 million information technology certifications by early 2000. Most of the certifications have been earned since 1997. "About half of those who earned certification did so outside the United States" (Adelman, 2000).

Table 1 – Headcounts of most popular industry-based certifications (source: (Adelman, 2000))

	Headcount	Date or Source
Microsoft Certified Professional (MCP)	521,639	June 14, 2000
Microsoft Certified Solutions Developer (MCSD)	27,427	June 14, 2000
Microsoft Certified Systems Engineer (MCSE)	279,745	June 14, 2000
Other Microsoft Certified Professional Programs	218,841	June 14, 2000
Certified Cisco Design Associate (CCDA)	4,000*	C&F, 1999, p. 24
Certified Cisco Internetworking Expert (CCIE)	4,996	July 31, 2000
Other Cisco Certifications	26,000*	Late 1999
Certified Novell Engineer (CNE)	175,000	Late 1999
Certified Novell Administrator (CNA)	370,000	Late 1999
Other Novell Certifications	18,300	Late 1999
Oracle (all certifications)	24,000*	Late 1999
Certified Info Systems Security Professional (CISSP)	1,500	C&F, 1999, p. 46
Citrix Certified Associate (CCA)	8,000	August 1999
A+ (Computer Technology Industry Association)	150,000	November 1999
Other Computer Technology Industry Assoc Certifications	15,600*	June 2000
Institute for Certification of Computing Professionals	50,000	July 2000
Natl. Assoc. of Communic Systems Engineers (all Certifs)	18,000	February 2000
Others (Baan, Sybase, SAP, Adobe, etc.)	43,778	Martinez, 1999
TOTAL:	1,936,826	

Note: C&F = Christianson and Fajan; 1999; *=unduplicated headcount estimate.

Evidently, it is hard to argue the eminent relevance of ICT certifications through concrete numbers showing how many ICT professional certifications have been issued because there is no central registry. Adelman (2000) reports that "[…] the data one can extract from various press releases, examination preparation books, and Web sites do not yield unduplicated headcounts. Most (though not all) vendors and industry associations, however, are pleased to provide the information when asked directly." Table 1 shows figures assessed by Adelman (2000). Although the figures are not up to date, they are likely a good evidence of the actual demand and importance of existing products on the market.

Looking for more up to date studies, it can be referred to (Fondazione, 2006) and a regularly updated top ten list of industry-based ICT professional certifications by Certification Magazine (Tittel, 2006) and (CertCities, 2007).

3. Policy relevance

Overview

For this initiative current policies of the European Commission in relation to education, training, employment and ICT Skills are of high relevance. Mainly the policies of the Directorates General (DG) for Enterprise and Industry, Information Society and Media Education and Culture, Employment, Social Affairs and Equal Opportunities, and EUROSTAT apply. Most influential initiatives to be mentioned are the European E-Skills Forum (and its follow-up activities) (http://ec.europa.eu/enterprise/ict/policy/ict-skills.htm) as well as Cedefop (the European Centre for the Development of Vocational Training, http://www.cedefop.europa.eu/) supporting the European policy agenda through its projects and networks (just to mention here the relevant virtual communities, http://communities.trainingvillage.gr/).

Not to forget the OECD's Working Party on the Information Economy (WPIE): ICT Skills and Employment (http://www.oecd.org/sti/ICT-employment/).

Other important stakeholders to mention are the ICT vendor industry, represented through e.g. The e-Skills Competence Consortium (eSCC, http://www.e-scc.org/), CompTIA (The Computing Technology Industry Association, http://www.comptia.org/) and the European Information & Communications Technology Industry Association (EICTA, http://www.eicta.org/).

Furthermore, professional associations play an important role representing many thousands of ICT professionals in Europe as e.g. CEPIS (The Council of European Professional Informatics Societies), besides the national professional informatics societies.

Standardisation bodies and relevant policies need to be taken into account, namely CEN/ISSS (European Committee for Standardization), foremost Workshop on ICT Skills, but as well other standardisation initiatives as e.g. Learning Technologies (IEEE), Reusable Competency Definitions (RCDs) and competency working group of HR-XML.

Policies of social partner organisations as UNI-Europa (Union Network International, http://www.union-network.org/) need to be considered by the initiative.

The project requires as well to liaise national public authorities to ghet their views and opinions about the addressed topic. Although global standards are demanded and beyond any doubt constitute a prerequisite strengthening the general awareness and recognition of ICT certification for ICT professionals in Europe, ICT education and training market in nonetheless local and typically demarcated through national (qualification) systems. Therefore it is important to cope with national characteristics of markets and needs to establish necessary partnerships to exploit mutual benefit of ICT professional certification.

The following Table overviews the current state-of-the-art by summarising the referenced projects with regard to deliverables and possible contribution/ relation to this initiative:

Overview of related work and projects :

year	contractor	name/ title	deliverables	contribution/ relation to project
2004	Cedefop	ICT Certification in Europe	- published report - conceptual model of ICT certification systems - empirical analysis - produced overview of certifications - attitudes of experts and stakeholders in the "community" - to propose possible ways forward in this area - important first step to approach and specify the underlying problem	- stimulated discussion and exchange of experience in the community - achieved general consensus about what ICT certifications are - underlined proliferation of products and non-transparent market
2004-2007	European Commission (Leonardo- da-Vinci)	HARMONISE Project	- "meta" perspective on ICT certification - knowledge base and comparable data on ICT certification - elaborated list of ICT certifications (online, not comprehensive) - empirical data (55 high-level experts - interview with employers - analysis of job adverts - validation of market	- reference material/ knowledge base - empirical data - partnerships and network of interest - possible ways forward to harmonise the market - clarification of realities - value and general recognition of certifications through employers
2006	Fondazione Politecnico di Milano	The European Certifications and Qualification Programmes Market in the ICT user sector	- public report - analysis of certifications: 9 vendor – specific (from CISCO, Microsoft, Oracle, SUN) and 12 vendor – neutral (from AITTS, EXIN, EUCIP , SACA , ISC) - 40 large European companies mainly end-users sectors (Energy, Finance, Manufacturing, Public Administration, Retail, Services)	- hands-on experience and best practices - empirical data - methodology - list of criteria
2004	CompTIA on behalf of eSCC	The Situation and the Role of E-Skills Industry Certification in Europe	- public report - history and nature of industry-based certifications - description of some prominent certifications (vendor-specific, vendor-neutral and vendor-independent) - performance standards - possible ways forward - learning blends - basic understanding about what industry-based certifications are able to deliver and what definitely not	- concept of performance components - problem description - possible ways forward - industry-based certifications

Relevant policies and initiatives to be mentioned are:

Lisbon Objectives

The European e-Skills 2006 Conference

Task Force on ICT Sector Competitiveness and ICT Uptake

The European Alliance on Skills for Employability

i2010 initiative and e-Inclusion

E-Skills for the 21st Century: Fostering Competitiveness, Growth and Jobs

Other policies and initiatives to be mentioned are the European Qualifications Framework, European Credit Transfer System (ECTS), European Credit System for Vocational Education and Training (ECVET), and Europass.

4. Market impact

The market impact is foremost characterised and measured by the degree in which identified needs of industry, Member states and the "market" in general are fulfilled.

In a response to the rapid expansion in the number of certifications (Adelman, 2000), lack of uniform differentiation between levels of certification, and the desire to ensure that the certification is a meaningful credential, it is crucial for the market impact that guidelines for both industry standards (including testing, currency of certification, continuing education/experience requirements, and support for practitioners) and accreditation of certification programs need to be developed involving the major market players.

CEN/ISSS Workshops provide the ideal arena for this endeavour. The aim is to arrive at a European consensus on reference models based on agreed, broadly recognised quality criteria that allow to judge about the quality of products on the market.

The results yielding from the project will then be published as a CEN Workshop Agreement (CWA). The deliverable will document available best practices and proposes codes of conduct or pre-standards for the ICT certification marketplace in Europe and likely beyond, with the formal backing of CEN, one of the three European Standardization Organisations.

Hence, it is required to set up a **voluntary network** in order to establish common procedures and to set clear targets for the work towards recognised ICT certification in Europe. The voluntary network will be embedded into the **CEN/ISSS Workshop on ICT Skills** hereby involving the aspired number of experts from different background and relevant stakeholders. The major market players will be actively involved in the preparation of the initiative, namely based on the above mentioned requirements foremost ICT certification and training industry, certification provider, professional associations, and academia.

The activities of the voluntary network may require a body that co-ordinates the activities of the voluntary network. The activities may be subdivided into additional working groups that are responsible for and specifically look into thematic priorities and thematic areas.

The potential should be investigated in which way a required partnership could offer clear guidance, shared "standards", available best practices and services for the Member states and organisations responsible for the regulation of ICT qualifications.

Adelman (2000) proposes three distinct strands of activity in this development that are constantly interacting and that need to be looked into:

- Establishing the Certification of Competence,
- Providing Opportunity-to-Learn,
- Testing and the Award of Certifications.

Standards are likely to evolve and need to be developed in those distinct areas.

Besides the conformity to standards as for example defined by normative documents as **ISO/IEC 17024**, a **common language** as already mentioned is urgently needed allowing the explicit definition of job requirements in the form of profiles.

The market impact of achieved results heavily rely on that training providers and companies' human resource managers and ICT professionals will be keen to apply the outcomes alongside national frameworks where these exist.

However, as the job requirements and technology needs in ICT are faster changing than in other branches, the definitions of requirements remain a moving target for industry and training providers. Joined initiatives should aim at bridging this gap by an easier specification through "standard" (reference) profiles and improved regular communication between stakeholders from demand and supply side to synchronise about what is actually needed on the market.

Industry is currently challenged by the absence of "**standardised" methods and tools** which might deal as reference; both in supporting the sound career planning as well as in supporting the development of specific trainings according to the specific, individual needs of employees within an organisation. Thereby, the goal is to develop professional training paths which are validated by credentials as e.g. degrees, diplomas, professional certifications, etc. The precondition is the availability of a common language and methodology to analyse and arrange job roles, occupations and qualifications by means of a coherent structure.

This provides the basis for any serious **future quality assurance** to build on. It has to be seen as the key to increased transparency, comparability and consequently portability of ICT certifications. The yielded results of the CEN/ISSS Workshop on ICT Skills build therefore a remarkable opportunity to develop and establish a shared model and approach for ICT in Europe.

In this way, new opportunities for the management of e-Competences and continuous development are emerging and exploited. Foremost, this would enable employees to take responsibility for their own professional development and to react easier to emerging skills gaps and needs of **certified specific skills sets** on the labour market.
In this way the European ICT Skills agenda and the goals of European Policy and Lisbon Strategy are supported.

5. Working method/approach

The CEN/ISSS ICT-Skills Workshop offers a neutral consensus platform and a public space for any party with an interest in working towards a European e-Competence Framework, and in interoperable model of ICT eCareer services. Consensus reached is documented in the Workshop's deliverables, called CEN Workshop Agreements (CWAs). The results and recommendations of the project will represent consensus among a large range of stakeholders (ICT sector, industry, academia, training organizations, unions, associations), invited to participate in the CEN Workshop on the subject or to comment electronically on work in progress.

This project is perceived as an integral part of the phase 3 of the CEN/ISSS Workshop on ICT Skills.

The aim of this approach is to be active in the market with a broadly recognised set of **competence portfolios** to which all programmes and offerings have to refer to. In this way the framework will help:

- **students and practitioners**, at individual level and as employees, to assess their competences in respect to a European Standard Syllabus and identify the gap to be covered by experience and/or training programs

- **enterprises and public bodies (as ICT users)** to assess their competence portfolio in respect or the European Standard or its own strategic portfolio; users will also be able to understand better what the labour market is offering in terms of “standard profiles”
- **vendors, distributors and system and service integrators** (as ICT suppliers) to assess their competence needs in respect on what the labour market is offering in terms of “standard profiles”
- **training bodies, schools and universities** to evaluate the contents of their educational and professional programs in respect of what the labour market is asking.
- **public national authorities** and individual national bodies within which they can develop the ICT profession according to their preferences and needs and which in turn incrementally lead to international standards.

> **Activity**: To overlook the market of ICT skills certification and compare the different products primarily by means of underlying certification schemes and curricula as well as clarifying the objectives and principles of certification products.

The aim of the activity which is the subject of this detailed technical proposal is to analyse the differences between the different ICT certification models. An appropriate approach is to look into the main **Vendor’s Certification** and that of some **Independent Certification Bodies**.

The project shall analyse two different situations:

- **ICT professional certifications “platform bound”:** examples of “platform-bound” certification programmes include almost all certifications proposed by Cisco, IBM, Microsoft, Oracle, Sun, etc. An **exception to this classification is CompTIA** A+ certification: in this case certifications can be considered “platform independent” for competences on hardware, but it seems to regard Microsoft Windows as the only one family of operating systems. In any case, only certifications proposed by the ICT industry are considered by CompTIA, thus neglecting all other programmes proposed by independent entities.

- **ICT professional certifications “platform independent”:** examples of “independent” certification programmes include AITTS (Germany), EUCIP (Europe), EXIN (NL), ISEB (UK), PMI (USA/WW), other international certifications such as ISTQB, IWA, etc. Independence from technology platforms does not necessarily mean that the certified skills are less practical: this issue is often solved by letting the candidate choose a platform on which to prove his/her skills.

We consider that a reasonable amount of information and data will be gathered to produce the desired result. The project has to analyse the following dimensions:

- the country scenario in which certifications are delivered; principal dimensions to describe the scenario would be defined at the project start up, but anyway will include the basic set of dimension expressed inside the European Innovation Scoreboard with a specific analysis on the ICT sector;
- the market of those certifications in terms of types, size and number of potential and actual customers, i.e. independent consultants, employees of suppliers, third parties, user companies, etc.; in case of national and international operations, it would be important to distinguish the way international certification schemes are adapted to national application;
- the economic and financial result of certification business at national and international level;
- the main process to capture certification interest at individual and company level (private and/or governmental support, type of promotion and share of media contribution, type of institution involved at national level, educational and vocational institution, etc.);

- Analysis of certification system, process and scheme (see Figure 1) by scrutinising underlying profiles, procedures (paradigm) implicitly identifiable in aspects as references, profiles, language, etc.

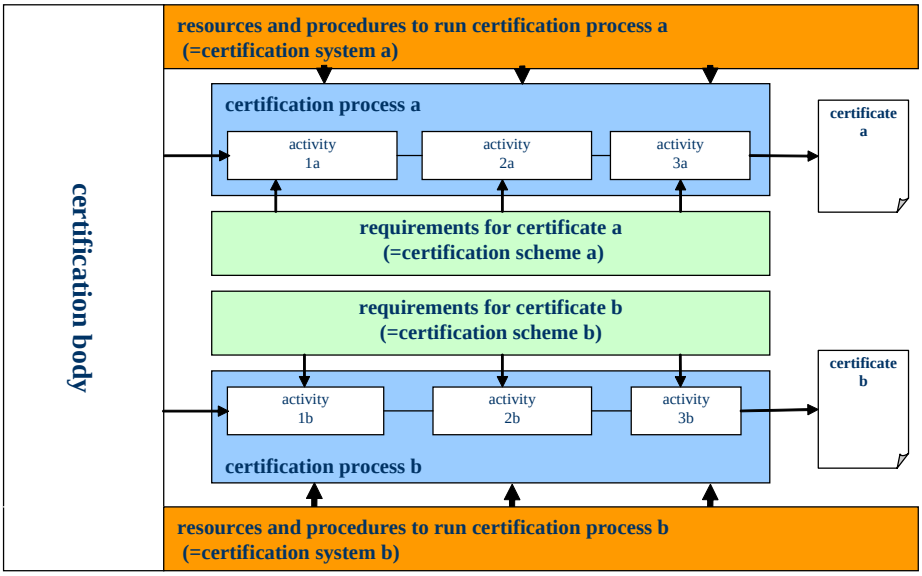

Figure 1 - The system of e-skills certification

- the main process to deliver training and examination test that guarantee the certification;
- volumes of customers, training days, certificates per year;
- type of resource involved to obtain the above mentioned results;
- level of conformity to standards recognised by the market and institutions;
- SWOT analysis (Strength and Weaknesses, Opportunities and Threats) of most influential systems in Europe and beyond.

Working Method :

The project work to be carried out is described in the following. The distinct steps to be taken are explained and derived tasks are looked into.

STEP 1

First activities encompass the review of current state-of-the-art literature and resources. The goal is to identify and assess reports, literature and other available resources in the field. Another aim is to agree on the analysis methodology as outlined above and criteria to be applied during the analysis task. Those activities are preparatory work leading to the aspired elaboration of a comprehensive map of the ICT professional certification landscape.

It is important to ensure that the most important domain: ICT certifications for ICT practitioners is kept in focus by the initiative.

The project team is therefore asked to demarcate its area of activity at the start from the wider context and by agreeing on the necessary focus of the work with field experts and the workshop. The foci of the work will be :

1. ICT professional certification and
2. competences in a specific field, namely specific ICT sectors of significance for industry.

In this way the project ensures that interim results will be available as soon as possible and that the work addresses the domain showing highest relevance for industry, namely ICT professionalism.

STEP 2

Next step comprises the creation of an inventory and market overview of certification programmes and products. As already mentioned, the boundaries of ICT certification are currently drawn by the ongoing proliferation of job titles and the alphabet soup of roles. Thus, an important task in step 2 is to overlook the actual marketplace and to collate the data and material collected from the different sources and stakeholders. The result is a repository that provides an overview of available systems.

Reference models will be condensed out of the collection of systems. In this way, the project builds a taxonomy that is applied to group the gathered credentialing systems in the repository by allocating them to the specified categories and reference models. In consequence, conceptual models are built to substantiate the identified reference models.

Constituent elements are analysed on the meta-level and the interaction of the identified process elements are pointed out. The extracted models reduce the analysed category of systems to components and constituent elements. In this way, the basic elements to develop the aspired overarching European map and framework of ICT professional certification are produced.

This responds to the aforementioned need developing a map of ICT professional certification that provides clear guidance for learners on the ICT training and certification market.

A workshop will be organised with field experts at early stage to be able to deliver a interim report after six months.

STEP 3

In step three the options and possible ways to derive European career paths for ICT professionals that guides learners through the marketplace. The European career pathways are likely to provide aspired “opportunity to learn” for individuals. In this context, it will be looked into the possibility to create bridges and transitions between the distinct credentialing systems. As a result, individuals would then be enabled to climb the various certification ladders and created hierarchies of certifications. This requires the recognition of examinations and modules from distinct systems as well as analogous the link to hierarchies of academic degrees (qualification levels). “In this context, qualifications are understood as sets of certified or documented skills - with no regard given to the respective learning path” (Hanf and Hippach-Schneider, 2005).

The **European e-Competence Framework** provides an important step creating the aspired overarching European framework of ICT professional certifications. The framework has to be built on an “overarching architecture” and “common language” (reference profiles and reference models). In this way, explicit performance standards are created that preferably link the non-formal and formal credentialing systems. By moving away from the current dominating focus on “job titles” and “job roles” on describing work in a common language would allow to use respective industry-based performance standards, actually delivered by industry ICT professional certifications, for multiple applications by various stakeholders (individuals, education, firms, industry, workforce development professionals, economic development professionals, etc.). This already sets the stage for the broadly endorsed European ICT Career Portal.

Today, some providers recognise and accept the examinations or certifications of other systems/vendors as part of their own certification processes. This necessitates establishing respective accreditation procedures which allow combining examinations and modules from different providers and programmes. However, this requires a common language and a “currency” or “value” for modules or passed examinations within other programmes. Approaches like credit transfer system (ECVET, ECTS) seem to offer appropriate methods and solutions. Thus, the potential to apply ECVET will be investigated.

All qualifications can, in principle, be organized in **units or unit standards** for which a certain amount of learning time can be assumed and corresponding credits can be granted. This already establishes the connection to the actual manifold discussions about sets or bundles of ICT skills/ competence, as basic units of qualifications that are located by means of common descriptors to achieve transparency, portability and diffusion of learning achievements in ICT in the educational

system and the labour market. In this way, all (sub-) qualifications can be described by learning outcomes and be organised in respective (standard) units. An overview of systems as well as an analysis and more profound discussions of the relation of competence and qualification frameworks can be found in (Dixon and Beier, 2006).

6. Performance indicators

Selected Project Team experts have also to contribute their best efforts so that the projects are meeting the following performance indicators:

Namely these are the category/policy impact indicators : effectiveness, stakeholder engagement, dissemination results and impact. For each category at least one indicator will be defined to measure the sub-project performance, progress and impact.

- For the activity first and foremost the "**quality of the produced outputs**" will be the indicator for the overall achieved level and quality of performance. This will be measured through the achieved degree of business relevance and impact for industry. Direct feedback from industry stakeholders is collected.
- Furthermore the "**number of participants**" counted in terms of physical number of interested bodies and entities in the countries for the specified activities will be evaluated to assess the achieved impact.
- The "**reputation of participants**" will be as well an indicator that will assess the performance and achieved impact of the activity.
- The indicator "**impact of dissemination activities**" will apply as well for the activities of this working group. The following metrics were identified:
    - number of entities reached (e.g. # of responses, feedback, contacts, etc.);
    - number of downloads of the produced project report;
    - received feedback (primarily qualitative but as well quantitative) from expert groups outside the CEN/ISSS community;
    - received feedback (qualitative and quantitative) from industry and from the certification market.

Last but not least, the shown interest and received feedback from the CEN/ISSS workshop plenary itself will be an important indicator to assess the quality of the project's output and the overall performance of the working group.

7. Work plan, milestones and deliverables

The work plan foresees the following tasks and activities :

Overview project tasks

Project Phase	European and International Level
	Project Team
Activity	• Analysis Methodology • Overview of State-of-the-art • Market overview, inventory • Map of the Certification Landscape • Conceptual Model • Components and constituent elements of certification systems, reference model • Final Report (CWA)

Deliverable
The results of the project are packaged and documented in form of a CEN Workshop Agreement (CWA). The overall goal is to gain and to strengthen the general recognition of ICT certification in Europe. Hence, the project links to existing initiatives and networks.

The **CEN Workshop Agreement (CWA)** will present an in-depth analysis of the current state-of-the art of ICT Certification in Europe.

The central aim is to clarify the nature of the next steps **towards the broad recognition and global acceptance of European ICT Certification in Europe.**

The objective is to elaborate a **map of the certification landscape** that helps people to better **navigate on the certification market.**

Recommendations are presented based on the achieved results from the analysis

Time Schedule
The project activities tasks are launched according to the following time schedule:
S = 1 January 2008

Milestones	Scheduling (in months)	Outputs and Deliverables
M0	S+1 to S+ 3	• Launching the project; selecting Project Team • **Kick-off meeting** (workshop plenary)
M1	S+ 4 to S+6	• **Workshop with field experts** • Common resources and understanding of problem • Demarcate area of activity and agree on focus of the analysis (such as offerings for ICT practitioners) • General approach and work procedures • Survey framework • Overview of state-of-the-art • Approach for market analysis • Initial structure and drafting of contents of final CWA • Specification of inputs required • Methodology to be applied for the analysis of ICT certification systems
Interim Report	S+6	**Delivery of the interim report** containing • Report on actions that far • Deliverables produced under M1
M2	S+7 to S+12	• Initial structure and first draft of conceptual model of ICT certification • Aggregated and condensed overview of market data and available reference models • **List of criteria** and dimensions to categorise, to compare and to better understand ICT certification systems
M3	S+13 to S+14	• Draft version of report (CWA) • Draft roadmap and plan for continuation of the next activities • Meetings with workshop plenary • **Feedback and recommendations by the Workshop Plenary**
M4	S + 15 to S+18	• Implementation of feedback and required revisions by the workshop plenary and identified experts • Final CWA • Adapted roadmap for future activities 2 and 3
Final Report	S+18	**Delivery of the final report** containing • Approved CWA • Performance indicators report • Adapted roadmap for future activities 2 and 3

Milestones
The section overviews the defined milestones of the project to monitor and to assess the overall project progress :

No.	Description
M0	Initialising and kicking off the project
M1	Preparatory work completed
M2	Analysis completed
M3	Draft version of CWA accepted: List of comments and request for revisions
M4	Final CWA finalised Start of formal approval process of the workshop

8. Project Team man day allocation :

Project Leader: Expert 1: **80** expert days

Two Executive Experts: Expert 2 and 3: **40 expert days each**

Total cost personnel: **104,000 EUR**

Expert	**Role**	**Resources** (person days)	**Estimate costs** (650 EUR/PD)
expert 1	project leader	80	52,000
expert 2	executive expert	40	26,000
expert 3	executive expert	40	26,000
	Total	**160**	**104,000**

- This table overviews the planned meetings in the course of the project :

#	Type of meeting	Purpose/ Description
3	CEN/ISSS workshop meetings	- Meetings with the workshop plenary for the purpose of feedback and guidance - **complete project team: 3 experts**
5	bilateral meetings	- additional meetings with stakeholders (as e.g. certification providers, test centres, enterprises, associations - **1-2 expert(s)**
4	working groups	- **one (1) workshop with invited experts** from certification providers, test centres - extended project team with (2-3 additional experts): 3 meetings; organised before or subsequent to CEN/ISSS WS meetings to reduce travel costs - members of the workshop are invited to participate - **complete project team: 3 experts**
12	**total**	

9. Criteria for selection of project team experts :

The **Project Team** will be composed of three (3) experts:

- one (1) *leading expert* and
- two (2) additional *executive experts*.

The members of the **Project Team** will be selected according to the rules of CEN by publication of a call for experts.

The project team needs to consist of experts from different background, namely ICT vendor, certification business (ICT training and certification industry) and research (academia). A preliminary list of experts has been created based on received expressions of interest in

supporting the project. In this way, the following names of experts could be identified forming the **core group** and/or **special interest group** that will actively support the project team, besides the extended group of experts formed by the workshop members.

Members of the **Core Group**, identified at the time of project submission, are the following experts (in alphabetical order):

- Mr Roberto Bellini, AICA
- Mr Michael Brown, SkillsNet
- Ms Anneke Hacquebardt, Grip-Project
- Mr Antonio Herreira, President, eSCC
- Mr Nikos Ioannou, CEPIS
- Mr Alex Keay, Microsoft
- Mr Hugo Lueders, Secretary General, eSCC
- Ms Clementina Marinoni, Fondazione Politecnico di Milano
- Mr Patrick Matthieu, Airbus
- Mr Jürgen Nilgen, Microsoft
- Mr Peter Revill, Base4 Operations Ltd
- Mr Paolo Schgör, EUCIP
- Mr Gerald Thiel, Dekra
- Mr Michiel van der Voort, EXIN
- Mr Peter Weiß, AIFB, University of Karlsruhe

The **Project Team** will closely interact and communicate with the CEN/ISSS workshop plenary, the workshop chairs and other in parallel launched activities and targeted working groups.

Annex II

Rules for the establishment and functioning of a Project Team in the CEN/ISSS Workshops

1 The concept of a Project Team (PT)

Project Teams are a light working structure, bringing together for a specified period of time a limited number of technical experts to complete specified tasks.

2 Types of work assigned to a PT

A Project Team may be created for each of the following purposes:

- to prepare a draft programme of work on behalf of a Workshop or Workshop Project, developing standardization/specification requirements;
- to provide support to a Workshop or Workshop Project on (a) specific and delimited task(s);
- to carry out a study or investigation and to produce a Report with recommendations to the Workshop or Workshop Project;
- to prepare the first drafts of CWAs for Workshop consideration and approval;
- to carry out editing of documents;
- to investigate and implement under the direction of the Workshop or Workshop Project prototype and pilot implementations of standards/specifications;
- to prepare and carry out specific implementations under the direction of the Workshop or Workshop Project (for example through the creation of a Web site, or a register of objects or codes, where CEN/ISSS is required to provide a service to the standardization community.

3 Proposal for a PT

Proposals to establish Project Teams may be made by an existing or proposed Workshop, or Workshop Project, or by registered Workshop participants. The proposal submitted shall include the proposed Terms of Reference of the PT, including Technical Proposals where available, and the expected deliverables with corresponding target dates, as well as the required resources.

The originators shall also indicate the priority accorded to the request, due justification why a Project Team approach has to be used and the corresponding funding.

Proposals shall be approved by (where appropriate) the Workshop Project participants, and by the Workshop Plenary.

4 Terms of Reference of a PT

The proposal for a PT shall provide the necessary information to enable a good understanding of the expected task(s) and the corresponding outcome.

Proposals must at least contain the following sections :

1) Title of the Project Team to be established
2) Subject and Scope
3) Justification of a PT
4) Reference authority (Workshop in charge of the follow-up of action)
5) General context/Background/Environment
6) Work plan, including duration and target dates
7) Manpower (in man-days or man-months)
8) Characteristics of the expertise required and criteria for selection of candidates
9) Expected deliverable(s).

If relevant, and according to the type of work assignment, the Terms of Reference should also provide information about reference specifications and documents, and connected working bodies.

A Workshop Plenary may decide to open calls for Technical Proposals to its members, if there is a need to establish the detailed workplan for the Project; such calls, to be made by the Workshop Secretariat and posted on the CEN/ISSS Web Pages, may be concurrent with the call for the Project Team's establishment. Technical Proposals may be made by companies or individuals. Selection of Technical Proposals shall be made by a Selection Panel as specified in section 5, and the selection approved by the Workshop Plenary. Approved Technical Proposals shall be included in the Project Team's Terms of Reference.

5 Approval and establishment of a PT

Calls for applications to become members of a PT shall be made by the Workshop Secretariat, and notified to the CEN Member bodies and to registered Workshop participants, with a minimum time limit of one month. Applications to become members of a Project Team shall be made only by individuals. Where a Project Team requires only an editing task, it may comprise only one individual.

A Selection Panel established by the Workshop shall make the selection of the best-qualified candidates for Project Team membership according to the criteria laid down in the call for candidates. The membership of the Panel shall include, the Chairman and Secretary of the Workshop (if they are not themselves candidates), the Project Manager of any relevant Workshop Project (if he/she is not a candidate) and a representative of the CEN Secretary-General.

One or more specialists who have a good knowledge of the subject concerned and its industrial and standardization environment may assist the Selection Panel. These specialists shall not be candidates for the PT or involved with the submission of competitive Technical Proposals.

The Selection Panel shall ensure the composition of the Project Team is balanced, having regard to the required expertise in the subject matter and the different interest groups present in the Workshop.

The Selection Panel shall inform the Workshop of the composition of the Project Team. Workshop participants with specific objections to the inclusion of one or more of the selected individuals shall notify the Chairman of the Selection Panel, with their grounds for objection. The Selection Panel shall consider any objections and notify the Workshop Plenary of the outcome of their consideration.

Contracts will only be signed with companies, in principle not with individuals. These companies bear total legal liability for the expert(s) from their companies and for the good execution of the work contracted.

One signatory of the contract shall be the Secretary-General, or the responsible person of the CEN member holding the Workshop Secretariat, the other signatory shall be the relevant management level of the organisation providing the expert.

Workshop Chairmen and Project Managers who become experts in a PT shall not chair those parts of the meeting discussing the PT's progress and deliverables. Workshop Secretariat officials who become experts in a PT shall resign from their duties until the PT completes its tasks.

6 Management of a PT

Supervision of the PT work lies within the responsibility of the CEN Secretary General, delegated to the Secretariat of the Workshop, which shall be responsible for the administrative procedure and payment of the PT experts.

The Workshop Plenary shall be responsible for monitoring the PT, and for the technical approval of its results. PTs not preparing a formal document for approval, but which have been responsible for other tasks, shall prepare a report on their activities for the Workshop's acceptance. The PT shall in any case be disbanded when its tasks are completed.

After consulting the CEN Secretary-General, CEN/ISSS or the CEN member holding a Workshop Secretariat may terminate a contract if there is evidence that a PT expert is not

fulfilling his/her contractual requirements or his/her performance is deficient. In general, any problems arising should be resolved with the organization providing the expert before a contract is cancelled.

7 Rules for financing of a Project Team

The Project Team members shall produce an invoice for each payment to be made by the CEN/CS. The CEN/CS commits itself to make the payments as rapidly as possible. However it can only make the payments after it has received the payment from the sponsoring body (e.g. CEC, EFTA Secretariat, private interest groups, etc.).

Annex III

CONTRACTOR-EXPERT - extract from General Terms and Conditions of the contract between CEN and a Project Team expert

Article 1/1/-A - Employee status for the EXPERT (Applicable to CONTRACTORS designating an Employee to participate in a Project Team)

The CONTRACTOR and CEN agree that the EXPERT shall be and remain an employee of the CONTRACTOR until the termination for whatever reason of the EXPERT's contract of employment with the CONTRACTOR, and shall not be deemed to be an employee of CEN.
The CONTRACTOR will continue to fulfil all legal obligations of an employer (e.g. social service contributions and charges, medical insurance contributions, fiscal charges and similar charges which are to be borne by any employer).
In addition, the CONTRACTOR shall ensure that adequate provision is made, whether by insurance or otherwise, to compensate for any injury or illness suffered by him/her in the course of the execution of the present contract.
The EXPERT shall perform his/her obligations under this contract without any bound of subordination to CEN and shall therefore not be subject to the dispositions of the Belgian law of 3 July 1978 relative to employment contracts.

Article 1/1-B - Self-Employed Status

(Applicable to self-employed CONTRACTORS EXPERTS)
The CONTRACTOR EXPERT and CEN agree that the CONTRACTOR shall remain a self-employed person and shall not be deemed to be an employee of CEN.
The CONTRACTOR EXPERT certifies that he/she is covered by a social security scheme in that capacity, and that he/she has taken adequate provision to cover his/her professional liability, and to cover him/her against the risk of injury or illness suffered by him/her in the course of the execution of the present contract.
The CONTRACTOR EXPERT shall perform his/her obligations under this contract without any bound of subordination to CEN, and shall therefore not be subject to the dispositions of the law of 3 July 1978 relative to employment contracts.