

European-Wide Recognition of e-Skills Certification from an Industry Perspective

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The use of IT is more crucial to the success of a company than ever. IT is not just technology, it is also innovation, processes and services, it is web enabling key activities; it is, in short, our gateway to information. IT literacy is therefore an essential skill in our society. This paper will look into topics like IT skills for non-IT-staff and skills for IT professionals. It will discuss recent developments in the market and give recommendations for training and certification. In most cases this will be done from an Industry and Certification Perspective.

1. Introduction

After the Internet bubble and the ‘Millennium Problem’ IT has been the topic of much criticism and doubt. Companies were reluctant to invest in IT and IT-staff. At the same time, security became a major issue. Many companies were spammed, systems hacked and confidential data lost (or even published). As a result of this development companies had to invest in a variety of new IT and security aspects.

Outsourcing of IT to other countries became a business priority. The general opinion was that outsourcing meant reduction of costs, less IT-worries and improvement of services.

The demand for training, especially standard software related training, decreased. Although reports showed a future demand for IT-staff, IT didn’t attract many new students and IT professionals switched to other branches.

Developments like these determine the arena of IT training and certification. From the perspective of the IT Industry and the major IT certification organisations, the years since 2000 have been very complex. Our central issue is how IT Industry, and especially IT certification organisations, can contribute to the quality of our future IT-staff and to the quality of future IT.

In Chapter 2 we will give a brief overview of the history of global IT certification and the key concepts of certification. The role of the parties involved and the goals of certification will be described.

In Chapter 3 we will introduce the concepts of ‘IT Industry’ and ‘IT User Industry’ We will go into detail in regard to the relation between the two. Furthermore we will give an example of an interesting cooperation of five stake holders. The three main target groups will be discussed.

Chapter 4 is aimed at bringing the key issue to a European context. In order to do that, we return to certification and the various national educational systems in relation to IT.

In Chapter 5 we summarize our findings and based on these we give recommendations towards future contributions by the global IT certification organisations.

2. IT certification

2.1- introduction

After a brief overview of the history of global IT-certification the present situation is summarised. In 2.3 we list and describe a number of important concepts, such as vendor related certification and formal education. In order to understand the goals and the benefits of certification, we concentrate on the way the general goals of certification can be linked up with the specific demand of the IT-market and providers of education and certification. In the last paragraph of this Chapter we summarize our findings and reflect on the central issue.

2.2 – how it started

In 1989 Novell launched the pioneering concept of global IT certification with the Certified Novell Engineer (CNE) program. Since 1990 the number of certification programs has grown rapidly. In 1994 it already exceeded 40. The underlying forces to this increase are similar to those promoting certification elsewhere: technological changes, business pressures and government initiatives. Originally certification was aimed at professions within the IT industry, later the goals shifted towards product and vendor related certification. The increase of the number of programs, the focus on skills instead of professions and the increase of the total number of examinations made IT certification less transparent. Divergence became one of the characteristics of IT certification.

2.3 - 2005

In its EMEA-survey¹, published in October 2004, CompTIA² lists some 80 IT security certificates. CompTIA's Career Tech Compass lists hundreds and hundreds of global IT certificates. CompTIA estimates that over 69 IT industry vendors run certification programs, with over 2400 different IT certification tests and approximately 4.5 million individuals certified annually worldwide. These numbers clearly suggest that there are too many IT certificates and that as a result of this IT management and Human Resource Management can not be expected to understand the value of these certificates. Moreover, since CompTIA's list is restricted to global certificates, the total number of IT certificates must be higher still. A recent survey by the European Centre for the Development of Vocational Training (Cedefop) confirms that the number is excessively high. Companies are looking for a transparent, trustworthy and limited set of (global) certificates.

2.4.1- vendor related certification

The Novell certification as described in paragraph 2.2 is an example of vendor related certification. In most cases the certificate is issued as a result of testing the skills and knowledge of the individual in regard to certain software or specific hardware. This form

¹ The Second Annual Survey into the State of the IT Training Industry in EMEA, October 2004, CompTIA

² See www.comptia.org

has been very popular in IT and still is. If the certification is related to software or hardware, the individual has proven skills in relation to that particular software or hardware, which is beneficial to the individual and the manager. It is also beneficial for the manufacturer of the software and hardware, since having more skilled users means less work for the helpdesk, better understanding of new features, more uptake of the new features and an even higher demand for yet more special new features in the future.

2.4.2 - vendor neutral or non-vendor related certification

A good example of vendor neutral certification was the AMBI-program established in the nineteen sixties in the Netherlands. The general goal was to set a standard for IT professionals and to bring Dutch IT to a higher level. The content of the program was not related to specific tools or hardware. It was focused on what we now might call 'Plan, Build and Operate'³. The success of AMBI was enormous, thousands of individuals were certified and AMBI was recognised as a standard by the Dutch Ministry of Economic Affairs. One of the added values of the AMBI program was that the content was still relevant after five or more years. Later that turned out to be its weak point: AMBI was criticised because it did not address today's tools and hardware.

Another vendor neutral program like CompTIA's A+ does not have this deficit, and it is a fine example of a mix between today's demand and vendor neutrality. It helps PC technicians to understand general principles on the one hand and today's PC and its technique on the other. The success of A+ is also based on the support by IT Industry.

A third example is the IT Infrastructure Library (ITIL) program as developed by OGC⁴, ITSMF⁵, ISEB⁶ and EXIN⁷. It includes a vendor neutral certification program in the field of IT Service Management. The program is supported by IT Industry and IT User Industry⁸. The ITIL program is also included in formal and non formal education.

2.5 - non formal and formal education

Formal education in this context refers to training or courses as part of a government supported (national) system. In general the target groups are pupils or students. The course is mandatory and the result of the test counts towards the final diploma. In general courses that are part of a formal educational program may differ from year to year, from teacher to teacher. The tests related to these courses may vary from school to school.

Non-formal education is training like Microsoft Certified Systems Engineer (MCSE) or CNE. It was not developed as part of a formal system and it is aimed at a different target group.

A recent development is to include non-formal education, like European Computer Driving License (ECDL), in formal educational programs. In the Netherlands for instance, ECDL may be used as a building stone towards formal certification. This is an interesting opportunity for students: on leaving school they are equipped with a formal diploma and a globally recognised certificate. Including ECDL can be beneficial to school programs: up to date standard and easy availability of course material and tests. It is to be expected that the

³ The Core level of EUCIP divides IT in these three phases. See www.eucip.com

⁴ The UK Office of Government Commerce. See www.ogc.gov.uk

⁵ The IT Service Management Forum. See www.itsmf.com

⁶ The Information Systems Examinations Board. See www.bcs.org/iseb

⁷ The Examination Institute for Information Science. See www.exin-exams.org

⁸ The concept 'IT User Industry' is used when referring to Industry with a core business other than IT and with a strong dependence on IT. More information in Chapter 3.

use of non-formal programs, especially the vendor neutral programs, in formal education will increase over the next years.

2.6 - goals of the certification

The goal of formal certification is laid down in legislation or government recommendations. Based on these generic goals schools and other interested parties will develop curricula, educational programs and material. Existing certification may be a part of the educational program. The way the program and its content are developed may differ. The objective of the vendor related program is closely related to the product and the demands of industry. This relation is significant in the development and validation of both the exam and the course.

The objective of the vendor neutral certification is not that obvious. Suppose we want to develop a vendor neutral certificate in the domain of Software Design and Development. Do we start by asking course providers for input? Or, since the certificate should be recognised by Industry, should we start by asking Industry? Thus two questions must be answered: what to ask and whom to ask.

2.7.1 - what to ask

To ask a group of Human Resource Managers what to develop in the field of Software Design and Development will, in general, not be the right approach. HR focuses on jobs and - more precisely - on job roles, using concepts like 'Responsibilities', 'Key activities' and 'Competences'⁹. Instead of choosing an IT topic we should start off designing a task or a job role. Database Designer could be a good start as such.

2.7.2 - whom to ask

Since IT has a technical background, HR-staff tends to leave the choice of IT courses to the IT staff and IT management. Putting the question to IT staff or IT management might result in an answer without the link to HR-concepts, though it will help us define the content of the certificate in depth. This done we should return to HR in order to link our certificate to the demand of the company. If this last step is neglected, we might end up with certificates that are less relevant to the business or hard to transfer to companies not involved in the development.

2.8 - goals of certification: revisited

⁹ Many definitions of this concept exist. As in most cases, we include technical and personal skills and knowledge and will use a more holistic approach.

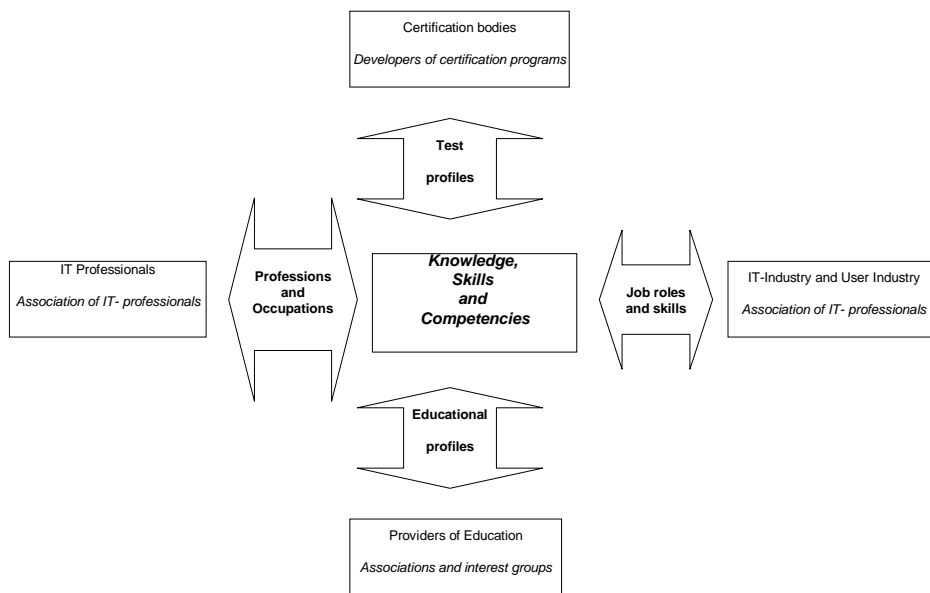


Figure 1: Parties involved and their concepts

The figure above shows the parties involved and the concepts they may use. For instance a certification body may use concepts like ‘Syllabus’ or ‘Exam requirements’ in order to define the test profile. A company may use ‘Job’ or ‘Responsibilities’. Introducing concepts like Knowledge, Skills and Competencies (as language) helps to improve mutual understanding between the parties involved.

The German Arbeitsprozessorientierten Weiterbildung/Advanced IT Training System (APO/AITTS)¹⁰ shows how the concepts in Figure 1 may be combined towards a work process oriented training and certification program.

Certification is a formal validation of knowledge, skills and competencies. The goal is to ensure that an individual has the knowledge, skills and competencies to perform a particular job.¹¹ The test or examination is an essential element of the certification process. In order to create value for individuals and companies, we must focus on the job or job role, then work towards knowledge, skills and competencies critical for that particular job or job role and finally describe the test criteria. If the candidate meets these test criteria, we conclude that the candidate has the right knowledge, skills and competencies and that he or she therefore must be considered to be successful in that particular job. This paper will not discuss this process or the way we test competencies.¹²

¹⁰ See www.IT-sektorkomitee.de or www.apo-it.de. More information on a conference on this topic in an international setting (Bonn, May 2005) on www.bibb.de

¹¹ See Chapter 1 in *The Complete Guide to Certification for Computing Professionals*, Drake Prometric, McGraw-Hill, 1995. Sometimes Certification and examination (or testing) is seen as one and the same. The definition as used in this article positions certification as a process, linking the individual’s skills, knowledge and competences to a job or job role. The test must be seen in this context.

¹² More information on this topic on www.cert-it.com, a brochure in English on Quality Assurance and Certification, related to the German certification of IT Specialists, in a European context.

2.9 – summary

Our key issue is the certification of individuals in IT. In this Chapter we described a number of involved parties and looked into the concept of certification. We conclude that it is of prime importance that the various perspectives are combined in order to be able to develop well recognised and valuable vendor neutral certificates. In the next Chapter we will look into the key issue from a different perspective, i.e. from an Industry point of view.

3. IT Industry and IT User Industry

3.1 - introduction

As discussed in paragraph 2.2, global certification programs tend to focus on hardware, software and tools as developed by the IT Industry. IT User Industry not only uses IT and IT services as provided by the IT Industry, it also uses the certificates as developed in the IT sector. In order to describe relevant job profiles for future IT professionals, we need to know the demand of both the IT Industry and the IT User Industry.

One may put forward that other dimensions should be added in order to have a good understanding of the Industry, such as number of employees or nationality. The number of employees is important in order to focus on the demand of Small and Medium Enterprises (SMEs) versus the demand of large companies. This paper touches on the specific demand of SMEs on the User side of the market in paragraph 3.4.

The aspect of nationality is important in order to be able to look into specific regional aspects. In general, the national aspect will be reflected in Chapter 4.

3.2 – target groups

With ‘IT professional’ we mean the employee having IT as a main responsibility. IT Industry introduced global certification of these jobs. Titles like Certified Novell Engineer (CNE, Novell) and Certified OS/2 Engineer (IBM) illustrate the link between the job and the specific software or context. At the same time companies developed job descriptions specific for their own company. As a result an enormous variety of job titles exists. Although we may have an inkling of what is meant by ‘Software Engineer’, the exact meaning may vary from company to company. Educational programs towards this job may also differ.

With ‘IT User’ we mean the employee using IT without having IT as a main responsibility. The IT User is not a producer of IT-products or services. IT in this context can mean the use of word processing software only or the use of a specific company application.

IT has become more and more relevant for the European citizen. In order to fully understand the benefits of IT the citizen needs to evolve towards an e-citizen, to be able to use the service of government and companies through the internet and to participate in modern society. This concept was defined by ECDL as ‘The e-citizen¹³ is one who is digitally literate and has the necessary critical skills to be able to make full and effective use of ICT’. Reports show that lack of digital literacy can be an important economical factor¹⁴.

¹³ E-citizen is also the name of a recently developed certification program. See www.ecdl.com

¹⁴ The study *Il costo dell'ignoranza nella società dell'informazione* by the Italian Association for Informatics and Automatic Computation (AICA) in collaboration with the Bocconi University School of Management (SDA)

3.3.1 – IT Industry

The concept ‘IT Industry’ is used when referring to Industry which has IT or IT services as core business. This includes companies developing and selling hardware, network systems, software, consultancy firms and out sourcing and off shoring services.

The Career Space project¹⁵ produced a list of occupations as major companies on the IT and Technology side of the market regard it. In general these professions address technical topics. Job role typologies such as ‘design’, ‘development’ and ‘specialists’ are used. The focus of the demand of the ICT-industry, as described by Career Space, is to keep up with technological change, make best use of products and services and to stay ahead with product development. It may be characterised as a pull-market.

3.3.2 – e-Skills Certification Consortium¹⁶ (eSCC)

In regard to certification, the eSCC promotes the role of industry and other non-formal certifications within EU national education frameworks.

The eSCC is a multi-stakeholders consortium bringing together representatives of Industry and training institutions with the aim of securing endorsement for and use of commercial, informal and formal ICT training certifications within government backed education and training frameworks across Europe.

The eSCC has a number of objectives, such as the development of public-private partnership agreements with relevant stakeholders in each member state, in order to facilitate the incorporation of Industry and non-formal training and certification within national education systems, and to directly influence policy development at EU level to ensure appropriate framing of policy recommendations to EU member states.

3.4 – IT User Industry

The concept ‘IT User Industry’ is used when referring to Industry with a core business other than IT and with a strong dependence on IT. IT User Industry includes Banking, Insurance, Retail and Automotive. Initially IT-staff working in the IT User Industry had tasks and responsibilities similar to IT-staff working in the IT-Industry. Over the years more specialised jobs moved from the IT User Industry to the IT Industry. This form of out sourcing has broadened. In general the IT User Industry will have a staff of IT professionals and will hire IT staff in regard to specialised jobs, consultancy or (project) management. This implies that IT User Industry depends not only on the quality of the IT products and services, but also on the quality of the hired IT professionals. From the perspective of certification this is an interesting aspect, since it explains why input from the IT User Industry is necessary and it emphasises the importance of transparency and recognition of the knowledge, skills and competencies of IT professionals.

shows that the lack of computer literacy in the workforce is costing the government approximately 15.6 billion euro. Other studies (for instance in the UK) show an increase in efficiency if IT training is provided.

¹⁵ See www.career-space.com, especially the job profiles

¹⁶ See www.e-scc.org

The IT User Industry is organized per branch (Retail, Finance et cetera). A study¹⁷ in The Netherlands showed that as a result of this the IT User Industry rarely takes part in the IT certification and education debate, and that it is generally assumed that IT skills profiles and IT certification meet the demand of IT User Industry. This implies that the IT Industry is not only supplier of IT and IT-services, but also of IT education, training and certification. The Dutch analysis mentioned earlier suggests that the IT User Industry would profit by having more generic job descriptions with a focus on Service Management, Information Management and Business Information in roles such as Manager, Administrator and Engineer.

In order to get the IT User Industry more involved in the development of education and training for IT staff, EXIN has recently initiated a CIO¹⁸-platform¹⁹ representing the User Side in the Netherlands. The members of this platform discuss various topics such as generic job descriptions. The results of these meetings have proven very fruitful. In September the CIO platform expects to publish a set of some 20 job profiles. EXIN will link these job descriptions to educational programs, including certificates by CompTIA, Microsoft, ECDL and EXIN.

Where the global companies on the user side of the market are looking for more specialised IT-staff, for example IT Resource Manager, SMEs tend to combine the various jobs. Also IT-staff of SMEs on the user side tend to have a more generic job description or company related responsibility. In a small company management assumes that the network is up and running. Therefore the system engineer has an overall responsibility to fulfil this demand, regardless technology, availability, bandwidth, resources or security issues.

3.5 – summary

Partly due to their organisation per branch, the IT User Industry in general has not been very involved in the IT education and certification development. Since IT industry benefits from vendor related training and certification, the development of training and certification of IT professionals is mostly dominated by the IT Industry.

From an Industry perspective we might tend to focus on the IT professional, the educational program towards that job and the industry supported certification. The quality of IT and the use of IT are also determined by the use of IT by non IT employees and the use of IT services by the general public.

4. specific EU opportunities

4.1 - introduction

Undoubtedly a challenge lies in matching the demand of the international or pan-European Industry with the variety of national educational systems. Companies prefer a centralised job approach and would like to relate their job descriptions to national systems and various national and international training programs. Airbus presented a good example of such a European demand during the kick-off meeting of the CEN/ISSS²⁰ project on certification in

¹⁷ This analysis was done by EXIN in order to get a better understanding of the User side of the market. The results are not publicly available.

¹⁸ Chief Information Officer (CIO)

¹⁹ More information in Dutch is available on www.cio-platform.nl

²⁰ European Committee for Standardization/Information Society Standardization System

Karlsruhe.²¹ In the presentation, *Optimise Skills, 'making the most of our people'*, the value of skills development for the employee, the manager and the organisation is clearly shown. Furthermore it shows how Airbus links competencies with strategy objectives. Testing, or assessing, is a crucial aspect of this alignment since it is used in order to measure the individual's competence gap and the result of training. Since Airbus has employees from different European countries, the Airbus competence catalogue uses sources from these countries.

4.2 – National and European

4.2.1 – IT professionals

In order to have valuable IT-job profiles, a European approach would be very helpful. Such a set of job profiles should be developed by both IT Industry and IT User Industry. The importance of this combination was described in Chapter 3. These job profiles would strengthen Europe in view of the achievement of the Lisbon Strategy and could be specified according to existing national formal educational programs and global vendor neutral and vendor related certification. To include global certification is necessary in order to follow market development world wide and to strengthen both the transparency of the programs and the mobility of the individuals. It will also increase interoperability.

The first step in this approach is recognition of the benefits of using these certificates in national and European formal programs. In my opinion a valuable second step would be bringing together pan European IT Industry and IT User Industry. These parties could work towards a set of generic job profiles supported by both Industries.

Both IT and IT User Industry would benefit from these developments since it would be clearer for future students what to expect from working in the field of IT. Educational programs could develop programs towards the set. This would increase the relevancy of the programs, both formal and non formal.

4.2.2 – IT User

The competencies of an IT User are different from those of an IT professional. Therefore programs for the IT user should not be linked to the set as described in 4.2.1. Since IT as used by the IT User may differ from company to company, a general approach is not likely to succeed. In my opinion this market will be dominated by IT Industry. Users may become more involved and so improve usability.

4.2.3 - e-citizen

The ECDL-definition of this concept is based on the individual and the use of ICT. In my opinion 'use of ICT' should be understood as 'Benefits, new opportunities and risks as a result of the use of ICT'. Using Internet is not about using a browser but about using Internet to connect with friends overseas, to strengthen social cohesion, to gain knowledge, to communicate with (new) people. But of course it also involves security issues and protecting privacy²². E-citizen training programs should therefore not only include knowledge of how to operate modern hardware and software, they should also focus on benefits, new opportunities and risks. Generally the importance of these topics is underestimated. The parties as pictured in Figure 1 may contribute to the development of e-citizenship. In my opinion however, taking the lead towards an e-citizenship as described in this paragraph would be the task of governments and preferably within an EU-framework.²³

²¹ See: www.uninfo.polito.it/WS_ICT-Skills/meet/Karlsruhe/Mathieu.pdf

²² The e-citizen must know how to protect the system against, for example, Phishing and Spyware

²³ See Objective 3 of 'i2010 – A European Information Society for growth and employment', Brussels, June 2005, Commission of the European Communities

5. conclusion

The meaning of the word ‘Certification’ should be understood as set out in paragraph 2.4. Certification links jobs or occupations to individuals and their knowledge, skills and competencies. The testing process may include vendor neutral and vendor related certification. Workplace oriented testing as described in APO/AITTS will increase the value of certification.

The first challenge lies in the development of a European set of IT jobs including knowledge, skills and competencies, supported by both IT and IT User Industry. ICT certification organisations, such as members of eSCC, could work towards transparency, for instance by linking their programs to the knowledge, skills and competencies of this European set. This would also improve the understanding of the value of global certification.

The second challenge lies in creating awareness and more profound understanding of e-citizenship within the boundaries of the EU, as this will also support SMEs to cross borders and to connect to pan European Industry. European e-citizenship may also be important towards coming closer to the goals regarding competition and innovation within Europe.

References:

1. www.e-scc.org. Official site of eSCC, a multi-stakeholders consortium focusing on promotion of the role of industry and other non-formal certifications within EU national education frameworks.
2. www.exin-exams.org. The goal of EXIN is to promote the quality of the ICT sector and the ICT professionals working in this sector by means of independent testing and certification. EXIN is well-known worldwide for its ITIL certificates in IT Service Management, a vendor neutral certification program in the field of IT Service Management.
3. www.apo-it.de. Site of the German Arbeitsprozessorientierten Weiterbildung/Advanced IT Training System (APO/AITTS). This system focuses on combining concepts of certification bodies or companies towards a work process oriented training and certification program.
4. www.cert-it.com. From this website the brochure entitled “Quality Assurance and Certification. Personnel Certification with the Advanced IT Training System” can be downloaded, related to the German certification of IT Specialists in a European context.