



# User guide for the application of the European e-Competence Framework

# 3.0



A common European Framework for  
ICT Professionals in all industry sectors



## Foreword

This CWA document publishes the European e-Competence Framework (e-CF) version 3.0; the result of 8 years continuing effort and commitment by multi-stakeholders from the European ICT sector.

The very first practical steps towards the e-CF were initiated in 2006 by Airbus, BITKOM, CIGREF, e-Skills UK, Fondazione Politecnico di Milano, IG Metall and Michelin, with the encouragement of the European Commission and strongly backed by the CEN ICT Skills Workshop community. From multiple market perspectives, roles and expertise, representatives of many organisations and also individuals have subsequently contributed to the e-CF initiative. They have collectively contributed to the development of the e-CF from their varied perspectives bringing technical expertise, political awareness or constructive feedback. The CEN ICT Skills Workshop wishes to recognize and acknowledge these multiple contributions from the following non-exhaustive list of organisations.

(ISC) <sup>2</sup>	Corporate IT Forum	Foundation IT Leader Club	MS Consulting & Research Ltd.
A/I/M bv	CPI Competenze per l'Innovazione	Poland	MTA
AFPA	Cyprus Computer Society	Fundación Inlea	NIOO
AICA	Dassault Systèmes	FZI	Norma PME
AIP-ITCS	DEKRA Akademie GmbH	HBO-I Foundation	Norwegian computer association
AIRBUS	Deutsche Telekom AG	HEINEKEN International	ORACLE
ASIIN e.V.	Diaz Research Limited	Hominem Challenge	PIN SME
Association Pasc@line	DND Norwegian computer society	IBM UK	PMI
Associazione Informatici Professionisti – Italiano	Dutch Ministry of Economic Affairs	ICT Human Capital	Pôle Emploi
computer society	ECABO	IG Metall	PROSA - Association of IT Professionals
ATI	ECDL Foundation	Innovation Value Institute	PSA Peugeot Citroen
Banca d'Italia	EDF Electricité de France	Innoware	PvIB (Dutch platform for information security professionals)
Bayer Business Services	EeSA European e-Skills Association	Institut PI	SAP
BCS Koolitus AS	e-Jobs Observatory	Intel Corp.	Skillsnet
BIBB - Bundesinstitut für Berufsbildung,	EMEA	IPA Japan	Syntec Informatique
Birkbeck University of London	empirica GmbH	Irish Computer Society	THAMES Communication
BITKOM	EMSI Grenoble	IT Akademie Bayern	The Corporate IT Forum/ national body of EuroCIO
Breyer Publico	ESI BG	IT Star	Trinity College Dublin
British Computer Society	e-Skills ILB	Italian Computer Society	UK Cabinet Office
Capgemini	e-Skills UK	ITcert Solutions	UNESCO
Capgemini Academy	Estonian Qualifications Authority Kutsekoda	itSECURITY*	Uni Duisburg
CEDEFOP	Estonian Association of ICT	itTRACK*	UNI Europa
CEPIS	EURO CIO	IWA Italy	UNINFO
CIGREF	Eurodisney	KPN	Université de Bretagne Occidentale
CIONET	European Metal-workers' Federation	KWB eV	University Danube/CEPA
CISCO	European Software Institute – CEE	LGMA	University Gent/ Fac. EC&BA
Cisco Systems	EXIN	LPI	University La Sapienza
Clock IT Skills	Fondazione Politecnico di Milano	Mapfre	
CompTIA Germany GmbH		Michelin	
Consultancy for Informatics and Education		Microsoft	
Hacquebard bv		MinEZ	
Consulthink		Ministère de l'éducation et de la recherche FR	
		Ministry of Economic Affairs, The Netherlands	
		MPSA	

## User guide for the application of the European e-Competence Framework

# 3.0

### A common European framework for ICT Professionals in all industry sectors

These guidelines support understanding, adoption and use of the European e-Competence Framework (e-CF) version 3.0.

The guide helps:

- To understand the overall context, background and aims of the European e-Competence Framework.
- To understand the main principles and methodological choices underpinning the European e-Competence Framework.
- To enable Information and Communication Technology (ICT) stakeholders – ICT demand and supply companies, the public sector, ICT managers and practitioners, HR developers, ICT job seekers, policy makers, educational institutions and social partners – across Europe, to adopt, apply and use the framework in their environment.

#### Further complementary materials available:

- European e-Competence Framework (e-CF) version 3.0 – a common European framework for ICT Professionals in all industry sectors (CWA Part 1)
- Building the e-CF – a combination of sound methodology and expert contribution. Methodology documentation (CWA Part 3)
- 15 case studies illustrating e-CF practical use from multiple ICT sector perspectives (CWA Part 4)

A multilingual e-CF profiling tool enables easy navigating through the European e-Competence Framework and related European ICT Professional Profiles together with customized profile construction and content export.

<http://profiletool.ecompetences.eu/>

## Table of contents

<b>0. European e-Competence Framework (e-CF) Founding principles</b>	<b>5</b>
<b>1. Executive overview</b>	<b>7</b>
<b>Background to the framework</b>	<b>7</b>
e-CF development history	7
From e-CF version 2.0 to version 3.0 – updating highlights	7
<b>European e-Competence Framework focus and purpose</b>	<b>9</b>
<b>European e-Competence Framework 3.0 overview</b>	<b>10</b>
<b>Main principles of the European e-Competence Framework</b>	<b>11</b>
<b>The user guidelines: purpose and target groups</b>	<b>11</b>
<b>2. Some Definitions</b>	<b>12</b>
European defined e-Skills groups	12
Competence, knowledge, skill, attitude	12
e-Competence proficiency levels	13
Embedding skills, knowledge and attitudes into the e-CF	14
<b>3. e-CF look and basic principles</b>	<b>15</b>
Framework purpose	15
Competence focus	15
The four dimensions of the e-CF	16
The e-CF structure	16
e-CF to EQF level relationship	17
Dimension 4 connection to ICT professional education	18
<b>4. e-CF, a shared European reference for adaption to specific needs</b>	<b>19</b>
Case studies	19
<b>Plan, develop and manage competences in a broader environment: companies and public sector, in particular ICT HR and competence managers</b>	<b>20</b>
Framework benefits for small and medium sized enterprises (SMEs)	22
<b>A European dimension of competence description</b>	<b>24</b>
Added value to existing frameworks – examples SFIA, CIGREF, AITTS, EUCIP	24
e-CF – an inspiration for new national/ local ICT frameworks	30
<b>e-CF reference for qualifications, training and certification</b>	<b>31</b>
ICT professional career development	33
e-CF for HR planning and job profiles development	33
e-CF in support of recruiting and sourcing processes	36
e-CF supporting understanding learning paths and training offers	37
ICT skills and competence planning for policy makers, industry sector associations and market watchers	37
<b>5. The e-CF Profiling Tool</b>	<b>38</b>
<b>6. Use of ICT sector terminology in the e-CF version 3.0</b>	<b>39</b>
<b>Annex: European e-CF and EQF level table</b>	<b>42</b>



## 0. European e-Competence Framework (e-CF) Founding principles

The European e-Competence Framework (e-CF) was established as a tool to support mutual understanding and provide transparency of language through the articulation of competences required and deployed by ICT professionals (including both practitioners and managers)<sup>1</sup>.

To support framework users and guide developers of e-CF applications, the following narrative provides an overview of the underpinning philosophy and principles adopted during e-CF construction and successive updates.

### The Guiding Principles

- **The e-CF is an enabler; it is designed to be a tool to empower users, not to restrict them.** The e-CF provides a structure and content for application by many types of users from organizations in the private and public sector, ICT user or ICT supply companies, educational institutions including higher education and private certification providers, social partners and individuals. In this broad application context, the e-CF is designed to support common understanding, not to mandate the use of each and every word used within the e-CF.
- **The e-CF expresses ICT competence** using the following definition: 'Competence is a demonstrated ability to apply knowledge, skills and attitudes for achieving observable results'. This is a holistic concept directly related to workplace activities and incorporating complex human behaviours expressed as embedded attitudes.
- **Competence is a durable concept** and although technology, jobs, marketing terminology and promotional concepts within the ICT environment change rapidly, the e-CF remains durable requiring maintenance approximately every three years to maintain relevance.
- **A competence can be a component of a job role, but it cannot be used as a substitute for similarly named job titles**, for example; the competence, D.7. 'Sales Management' does not represent the complete content of a 'Sales Manager' job role. Competences can be aggregated, as required, to represent the essential content of a job role or profile. On the other hand, one single competence may be assigned to a number of different job profiles.
- **Competence is not to be confused with process or technology concepts** such as, 'Cloud Computing' or 'Big Data'. These descriptions represent evolving technologies and in the context of the e-CF, they may be integrated as elements within knowledge and skill examples.
- **The e-CF does not attempt to cover every possible competence deployed by an ICT professional or ICT manager nor are the included competences necessarily unique to ICT.** The e-CF articulates competences associated with ICT professional roles including some that may be found in other professions but are very important in an ICT context; examples include, C.4 'Problem Management' or E.3 'Risk Management'. However, to maintain an ICT focus, the e-CF avoids generic competences such as 'Communications or General Management' although very applicable these transversal competences are comprehensively articulated in other structures. Selecting competences for inclusion within the e-CF is therefore, not a scientific choice, but a pragmatic process engaging a broad cross-section of stakeholders who prioritise competence inclusion based upon industry knowledge and experience.
- **The e-CF is structured from four dimensions.** e-competences in dimension 1 and 2 are presented from the organisational perspective as opposed to from an individual's perspective. Dimension 3 which defines e-competence levels related to the European Qualifications Framework (EQF), is a bridge between organisational and individual competences.

<sup>1</sup> see definitions adopted by the EU e-Skills Forum and e-CF user guide chapter 2

- **The e-CF has a sector specific relationship to the EQF;** competence levels within the e-CF provide a consistent and rational relationship to levels defined within the EQF. The relativity between EQF learning levels and e-CF competence levels has been systematically developed to enable consistent interpretation of the EQF in the ICT workplace environment.
- **Continuity of the e-CF is imperative;** following maintenance updates it is essential that users are provided with a simple upgrade path. e-CF users invest considerable time and resources to align processes or procedures with the e-CF. Organisations deploying these downstream activities are reliant upon the e-CF and need to be confident of the continued sustainability of their processes. Updates of the e-CF must recognise this requirement and provide for continuity enabling use of the existing e-CF version until it is convenient to upgrade to the latest version.
- **The e-CF is neutral and free to use;** it does not follow the specific interests of a few major influencers, it is developed and maintained through an EU-wide balanced multi-stakeholder agreement process, under the umbrella of the European Committee for Standardization. The e-CF is a key component of the European Commission's Digital Agenda; it is designed for use by any organisation engaged in ICT Human Resource planning and competence development.



## 1. Executive overview

### Background to the framework

The **European e-Competence Framework (e-CF)** is a reference framework of competences applied within the Information and Communication Technology (ICT) sector that can be used and understood by ICT user and supply companies, ICT practitioners, managers and Human Resources (HR) departments, the public sector, educational and social partners across Europe.

The framework has been developed, maintained and supported in practical implementation by a large number of European ICT and HR experts in the context of the CEN Workshop on ICT Skills. The workshop provides a discussion and working platform for both national and international representatives from the ICT industry, public and private vocational training organisations, social partners and other institutions. It aims to create long-term human resources (HR) and competence development solutions for the European Information and Communication Technology (ICT) community.

### e-CF development history

In 2005, further to the recommendations of the European e-Skills Forum, the CEN ICT Skills Workshop members agreed that national ICT framework stakeholders as well as European ICT industry representatives – both human resources and ICT experts – should consider developing a European e-Competence Framework.

Encouraged and accompanied by the European Commission, ICT framework stakeholders coming from the French association of large ICT demand companies CIGREF, the SFIA representing sector association e-Skills UK and the AITTS representing German social partners IG Metall and BITKOM met with representatives from European larger companies (Airbus, Michelin) and the applied research foundation Fondazione Politecnico di Milano for a kick-off early 2006 in order to put this intention into practice.

During an intensive follow-up, they designed a programme to work towards a European

e-Competence Framework under the umbrella of the CEN Workshop on ICT Skills. These efforts were welcomed and recognised in the Communication of the European Commission on “e-Skills for the 21st Century: Fostering Competitiveness, Growth and Jobs” of September 2007 and the Competitiveness Council Conclusions of November 2007.

In order to achieve a European agreement and useful results at an international and national level, the Europe-wide involvement of further ICT sector players and stakeholders from business, politics and education has been crucial to the framework development philosophy and strategy. Whilst at the political level it was important to get the larger multi-stakeholder public of the European ICT sector engaged; at the expert working level focus was placed upon HR and IT management know-how from the European ICT industry.

The European e-Competence Framework version 1.0 was published in 2008 from the outcome of two years e-Skills multi-stakeholder, ICT and human resources experts’ work from multiple organisation levels (CWA 15893-1 and CWA 15893-2).

The European e-Competence Framework version 2.0 was published in 2010, now also with dimension 4 fully developed, and it was accompanied by an updated user guide and a newly developed methodology documentation. Presented in the CWA 16234-1, -2 and -3 the second version of the framework built upon the e-CF version 1.0, taking into account the first e-CF application experience and feedback from ICT stakeholders across Europe. An easy to use on-line tool was published to support navigation through the framework and user-specific profile building in English language.

### From e-CF version 2.0 to version 3.0 – updating highlights

The European e-Competence Framework version 3.0 presented by this CWA document is the result of the CEN ICT skills Workshop Project “e-CF support and maintenance – towards e-CF version 3.0” (2012-2013). Version 1.0 was focused upon pioneering

development of dimensions 1, 2 and 3 and version 2.0 provided the framework developed in all four dimensions. Version 3.0 project activity was guided by the overall maturity of the e-CF, reviewing framework underlying principles, content, plus practical acceptance and use by deploying stakeholders.

Feedback from more than 120 stakeholders from across Europe and abroad was systematically evaluated and considered within the e-CF version 3.0 updating process. Many technical suggestions were backed by e-CF user practical experience that provided high value to the updating activity.

Care has also been taken to ensure that existing users of version 2.0 are able to adopt version 3.0 without excessive effort. Guided by the overall mission to minimise changes but maintain continued framework relevance and continued ease of application for multiple ICT stakeholders in compliance with the e-CF Founding principles listed in chapter 0; the framework update to version 3.0 is characterized by the following highlights:

- Four new competences have been added.
  - A.9 Innovating
  - B.6 Systems Engineering
  - D.11 Needs Identification
  - D.12 Digital Marketing
- As a response to stakeholder comments received in the context of version 1.0 and 2.0, the design and development process was articulated more clearly.
  - The v 2.0 competence B.1 Design and Development has been divided into two competences: B.1 Application Development and B.6 Systems Engineering
  - This leads to further clarity and refinement of the design element within: A.5 (systems design) and A.6 (applications design)
  - The development element of the process is further enhanced in: B.1 (related to applications) and B.6 (related to systems)

- The need to consider new emerging business, technology and development process trends (mobile, cloud, big data, lean management, iterative approach...) and to consider the changing priorities of existing issues (e.g. security) were addressed across the entire framework and incorporated within relevant dimensions.
- Extracting value from the “e-CF into SME” project (see: CWA 16367:2011), the perspective of small and medium sized enterprises has been incorporated within version 3.0. Examples include the new competence D.11 Needs Identification, the applied research perspective is now addressed and a new competence A.9 Innovation introduced.
- A systematic review was taken of leadership components of the e-CF, also informed by the concept of e-leadership and where relevant both components were further integrated.

Project activities supporting the framework update, helped to expand the exchange of information between the network of e-CF stakeholder supporters and users across Europe. Some information exchanges were systematically registered by documenting case studies to illustrate e-CF use in practice.

In summary, the CEN ICT Skills Workshop Project “e-CF support and maintenance – towards e-CF version 3.0” (2012-2013) led to the following documented outcomes:

- European e-Competence Framework 3.0. A shared European framework for ICT Professionals in all industry sectors (CWA Part 1)
- User guidelines for the application of the European e-Competence Framework (CWA Part 2)
- Building the e-CF. A combination of sound methodology and expert contribution. Methodological documentation of how the e-CF was developed (CWA Part 3)
- 15 case studies illustrating practical e-CF application experiences from multiple perspectives (CWA Part 4)



Supporting e-CF application within multiple environments; the case studies provide examples, benefits and hints of how to make best use of the e-CF. They have been elaborated in collaboration with European-wide e-CF users.

Furthermore, the existing e-CF profiling on-line tool was enhanced, now featuring a multilingual capability, embedding the European ICT Professional Profiles, alternative e-CF navigation options, individual profile creation and content export facilities.

The European e-Competence Framework is a key component of the “Grand Coalition for Digital Jobs” launched by the European Commission in March 2013 to fill the digital gap.

## European e-Competence Framework focus and purpose

The European e-Competence Framework (e-CF) is a reference framework of ICT competences that can be used and understood by ICT user and supply companies, the public sector, educational and social partners across Europe.

The framework provides an international tool for:

- **ICT practitioners and managers**, with clear guidelines for their competence development
- **HR managers**, enabling the anticipation and planning of competence requirements
- **Education and Training**, enabling effective planning and design of ICT curricula
- **Market researchers and policy makers**, providing a clear and Europe-wide agreed reference for evaluating and anticipating ICT skills and competence needs in a long-term perspective.
- **Procurement managers**, providing a common language for effective technical terms of reference in national and international bids.

The European e-Competence Framework focuses on competences needed

- to develop, operate and manage ICT projects and processes
- to exploit and use ICT
- to make decisions, develop strategies, and
- to foresee new scenarios.

Recognising that Information and Communication Technology is a crosscutting issue, the European e-CF addresses target groups involved in ICT business processes.

Thus the European e-Competence Framework considers:

- the suppliers and customers (the ICT industry and end-user companies including services and the public sector) in all company sizes, multinational and also small and medium sized enterprises; and
- the ICT practitioners and managers whatever their function, role or job may be in the ICT business process.

Accordingly, the e-Competence Framework does not consider competences related to basic/ scientific ICT research.

Furthermore, the e-Competence Framework purpose is to provide general and comprehensive e-Competences that can then be adapted and customised into different business contexts such as e-commerce, e-health, e-banking, etc.

The European e-Competence Framework 3.0 provides a basic, clear and sound orientation for organisations and companies acting in the ICT sector and needing to take decisions about recruitment, career paths, training, assessment, etc. The e-CF is useful for promoting clear understanding of company competence needs at the workplace, and via dimension 4 also for promoting clearer understanding of qualification including higher education, vocational and continuing training and certification offerings.

## European e-Competence Framework 3.0 overview

Dimension 1 5 e-CF areas (A – E)	Dimension 2 40 e-Competences identified	Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3–8				
		e-1	e-2	e-3	e-4	e-5
A. PLAN	A.1. IS and Business Strategy Alignment					
	A.2. Service Level Management					
	A.3. Business Plan Development					
	A.4. Product/Service Planning					
	A.5. Architecture Design					
	A.6. Application Design					
	A.7. Technology Trend Monitoring					
	A.8. Sustainable Development					
	A.9. Innovating					
B. BUILD	B.1. Application Development					
	B.2. Component Integration					
	B.3. Testing					
	B.4. Solution Deployment					
	B.5. Documentation Production					
	B.6. Systems Engineering					
C. RUN	C.1. User Support					
	C.2. Change Support					
	C.3. Service Delivery					
	C.4. Problem Management					
D. ENABLE	D.1. Information Security Strategy Development					
	D.2. ICT Quality Strategy Development					
	D.3. Education and Training Provision					
	D.4. Purchasing					
	D.5. Sales Proposal Development					
	D.6. Channel Management					
	D.7. Sales Management					
	D.8. Contract Management					
	D.9. Personnel Development					
	D.10. Information and Knowledge Management					
	D.11. Needs Identification					
	D.12. Digital Marketing					
E. MANAGE	E.1. Forecast Development					
	E.2. Project and Portfolio Management					
	E.3. Risk Management					
	E.4. Relationship Management					
	E.5. Process Improvement					
	E.6. ICT Quality Management					
	E.7. Business Change Management					
	E.8. Information Security Management					
	E.9. IS Governance					

## Main principles of the European e-Competence Framework

The European e-Competence Framework has been developed from an employer and ICT process oriented viewpoint to serve the needs of the European ICT practitioner and manager community. It is a Competence Framework based on the following definition.

Competence is a demonstrated ability to apply knowledge, skills and attitudes to achieving observable results.

The e-CF addresses the need for ICT competence translation across European national borders by

- Providing a structure which can be utilised by nations without an existing ICT competence model.
- Providing a structure which can be linked to existing national ICT competence models to support common European translation.

The primary focus of the European e-Competence Framework is to relate to employer career path structures. As a direct consequence it reflects 'flatter' organisational structures now commonly deployed by industry. This trend towards simplification of career paths is reflected in the European e-Competence Framework by focusing the e-competence descriptions on dimension 2 and dimension 3 comprising of five proficiency levels, the e-Competence levels e-1 to e-5. Dimension 4 (knowledge & skills) is added for inspiration, it is neither intended to be exhaustive nor descriptive.

Competence and qualifications are distinct entities and no perfect relationship can be established between them. However, the e-CF has related proficiency levels to the learning outcomes of the EQF. This association of e-Competence levels e-1 to e-5 with EQF levels 3 to 8 is knowingly imprecise but facilitates necessary orientation between employer centric competences and education centric learning outcomes.

To illustrate level difference we can use the example of a person with a Ph.D.; this equates to EQF level 8. However, the Ph.D. holder is not automatically able to apply knowledge, skills and attitudes in the workplace at e-Competence level e-5. The competence requirements for a particular job role demand more than qualification achievement. Experience, proven capability to act in complex situations etc. must also be considered.

However, the language structure adopted in the e-CF can be related to learning outcomes. Thus, possible linkages between competences (European e-CF) and learning outcomes (EQF) are made transparent and objective.

## User guidelines: purpose and target groups

A European reference set of ICT competence definitions is unlikely to match a company or institution's needs perfectly. The European e-Competence Framework is intended for guidance and is designed to provide a common shared reference tool which may be implemented, adapted or used in accordance with ICT player requirements.

This document provides some basic guidance for understanding, adopting and using the European e-Competence Framework version 3.0 according to individual need. The main purposes are:

- to present the overall context, background and aims of the European e-Competence Framework (Part 1),
- to explain the main concepts, methodological choices, underpinning structure and concrete components of the European e-Competence Framework (Part 2 + 3),
- to enable ICT players – ICT user and supply companies, the public sector, ICT managers and practitioners and those who want to start a career in the ICT, policy makers and research institutions, educational and social partners – across Europe to apply and use the framework in specific environments and to adopt it according to specific needs (Part 4).

## 2. Some Definitions

### European defined e-skills groups

The European e-Skills Forum, building on the activities of the Career Space initiative, adopted a definition of the term “e-skills” covering three main categories:

- **ICT practitioner skills:** the capabilities required for researching, developing, designing, strategic planning, managing, producing, consulting, marketing, selling, integrating, installing, administering, maintaining, supporting and servicing ICT systems.
- **e-business skills:** the capabilities needed to exploit opportunities provided by ICT, notably the Internet; to ensure more efficient and effective performance of different types of organisations; to explore possibilities for new ways of conducting business/ administrative and organisational processes; and/or to establish new businesses.
- **ICT user skills:** the capabilities required for the effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work. User skills cover the use of common software tools and of specialised tools supporting business functions within industry. At the general level, they cover “digital literacy”.

Following the “e-” definitions as adopted by the European e-Skills Forum, the European e-Competence Framework focuses on **competences which are needed and applied in the ICT business related workplace including both ICT practitioners and e-business managers.**

The ICT user perspective (users of IT applications such as word processing, spread sheets, etc.) and related competences have not been included.

### Competence, knowledge, skill, attitude

The European e-Competence Framework makes reference to some common concepts also defined and used within the European Qualifications Framework (EQF); namely knowledge (K), skill (S) and competence (C).<sup>2</sup>

- **Knowledge** and **skill** express the same meanings in both frameworks.
- **Competence** is described in terms of “responsibility” and “autonomy” in the EQF, but “responsibility” and “autonomy” are not explicitly emphasised in the e-CF definition. The e-CF definition does not make these concepts explicit because they can be difficult to interpret by organisations when applied to individual’s competences.

In the EQF, a competence is *“the proven ability to use knowledge, skills and personal, social and/or methodological abilities in work or study situations and in professional and personal development”*<sup>3</sup>.

In the e-CF, a competence is *“a demonstrated ability to apply knowledge, skills and attitudes for achieving observable results”*. If we compare these two definitions, we realise that the expression *“abilities”* mentioned in the EQF is close to *“attitudes”* indicated in the e-CF.

If the meaning of the two definitions is similar then why has the e-CF competence definition been created? There are at least two reasons:

1. Definitions provided in the e-CF are aligned to company/ workplace needs and views, they reflect company requirements and expectations for workplace capability, and are expressed in their language.

<sup>2</sup> See also CWA Part III: Building the e-CF – a combination of sound methodology and expert contribution.

<sup>3</sup> The European Qualifications Framework for Lifelong Learning, April 2008



2. The e-CF is designed to relate to specific skills and job profiles frameworks (e.g. AITTS, Cigref, Eucip, SFIA, etc) coming from different cultures and experiences across Europe. It must provide a translation of these approaches as well as provide a European identity.

Consequently, the definitions for knowledge, skill and competence have been developed within a European ICT business environment.

The definition of attitude is also supplied. It is close to the concepts of “manner” and “demeanour”, it is the French “savoir être”. In business environments, it is most relevant when used in context, i.e. when integrating specific abilities to perform.

In summary, the European e-Competence Framework uses the following definitions:

- **Competence** is defined as **“a demonstrated ability to apply knowledge, skills and attitudes for achieving observable results”**.

Consequently, the related e-Competence descriptions embed and integrate knowledge, skills and attitudes.

- **Skill** is defined as **“ability to carry out managerial or technical tasks”**. Managerial and technical skills are the components of competences and specify some core abilities which form a competence.

- **Attitude** means in this context the **“cognitive and relational capacity”** (e.g. analysis capacity, synthesis capacity, flexibility, pragmatism...). If skills and knowledge are the components, attitudes are the glue, which keeps them together.

- **Knowledge** represents the **“set of know-what”** (e.g. programming languages, design tools...) and can be described by operational descriptions as well.

## e-Competence proficiency levels

“Level” is another basic concept used within the European e-Competence Framework. It is identified in the e-CF Dimension 3.

In the e-CF this concept refers to “proficiency” levels instead of “learning” levels in the EQF. This is another reason why e-CF levels are different from the EQF levels, even though strong relationships can be found.

A proficiency level integrates three facets, as shown in the e-Competence level table in the Annex: context complexity, autonomy<sup>4</sup> and behaviour. Hence, the proficiency levels described in Dimension 3 embed these three components.

All these dimensions are also present and easily identifiable within the EQF definitions and descriptions. This maintains a uniform relationship between the two frameworks.

In particular, in the e-CF, these three dimensions can be summarised as following:

- **Autonomy** ranges between “Responding to instructions” and “Making personal choices”.

- **Context complexity** ranges between “Structured – Predictable” situations and “Unpredictable – Unstructured” situations.

- **Behaviour** here represents an observable outcome of attitude and ranges between “the ability to apply” and “the ability to conceive”.

<sup>4</sup> “personal autonomy”, i.e., the capacity to perform without needing directions, is a necessary component to define proficiency levels, hence, it must be embedded in definitions of Dimension 3. On the contrary, “Responsibility”, if meant as the “personal sense of responsibility”, is not related to proficiency levels, in fact even a very young employee at level 1 of the e-CF could/should have a high sense of personal responsibility. Accordingly, “responsibility” is not a component of proficiency level concept.

## Embedding skills, knowledge and attitudes into the e-CF

The e-CF competence definitions of skills, knowledge and attitudes are embedded into the competence descriptions in Dimension 2 and in Dimension 3. They are combined to present a holistic perspective.

This can be illustrated by using the example C.3. Service Delivery. In **Dimension 2**, the competence is described as follows: *“Takes proactive steps to ensure a stable and secure application and ICT infrastructure. Updates operational document library and logs all operational events. Maintains monitoring and management tools (i.e. Scripts, Procedures...)”*

This description embeds:

1. **Knowledge** about IT service delivery requirements, standards in IT service delivery, monitoring service delivery etc.
2. **Skills** related to applying service delivery processes, filling and completing documentation etc.
3. **Attitudes** such as foresight, analysis, professionalism etc.

In **Dimension 3**, competence descriptions are specified at each appropriate proficiency level. Descriptions still embed knowledge, skills and attitudes as in Dimension 2.

**Dimension 4** gives some explicit examples of knowledge and skills that may be relevant for competence performance as described in Dimension 2 and 3.

Attitudes are still embedded because if separated they would lose their relevance and meaning. Owing to the “soft” nature of attitudes, meaning is only relevant when used in context.



## 3. e-CF look and basic principles

### Framework purpose

In the first instance the European e-Competence Framework (e-CF) establishes a European common language for ICT competences. It supports the definition of jobs, training courses, qualifications, career paths, formal and non-formal learning paths, certifications etc. in the ICT sector. In this way, local, national, European and global ICT supply and demand companies as well as qualification and certification providers have access to a shared reference.

The application of the European e-Competence Framework is centred upon workplace competence articulation, profiling, assessment and measurement. Although the e-CF can be related to other types of framework such as qualification, certification or knowledge structures its core purpose is to provide a 'European ICT Competence Reference'.

Within this context, level linkage can be provided between the European e-CF and the EQF. Although the frameworks are designed for different purposes they share some characteristics which have been exploited to establish the reference table 1 at p. 15.

Primary purposes of the European e-Competence Framework are highlighted below:

1. The European e-CF describes competence and can be used in a variety of applications where consistency of competence language is required. These include job descriptions, role profiles, competence specifications and articulation of professional development needs.
2. It identifies proficiency at 5 e-competence levels and can be used to provide detailed profiling where various competence combinations are involved. Career path association supports workforce development for roles with defined competences.

3. Assessment of competence from a job role perspective enables targeted and efficient recruitment, contracting, sourcing and hiring.
4. Measurement of competence gaps at the individual, team or organisational level enables short and long term planning by HR management or by individuals to assess and budget for education and training needs.

As the framework becomes more universally applied then further applications can be envisaged. These include curriculum and ICT qualification and certification development. The European e-Competence Framework is a tool which will facilitate new national and especially European offers of education/qualification. It will provide a link between jobs, competences and qualification. In addition it may support the development of employer focused certification.

The opportunities for improving the efficiency and effectiveness of recruitment processes by adopting the European e-Competence Framework are significant. The Framework is also an enabler, making it possible for National and European students to better understand the possibilities offered by the ICT jobs and to identify future career opportunities.

### Competence focus

The European e-CF is not based on job profiles but rather on competences as this approach is more flexible. Between companies it is common to find identical job titles that correspond to different job descriptions and vice-versa. Moreover, both job titles and job descriptions are often inadequate when expressing capabilities required in the workplace. ICT business environments are complex and change continuously; complexity and constant change make job related structures too fixed and rigid and therefore ineffective for describing tasks and activities within an international environment.

Competences are in contrast general yet sufficiently comprehensive to represent complexity and to fit variable organisation structures. Competence identification helps to fine-tune changes and to plan for the future. Moreover, disparate competence combinations can produce various job profiles to meet organisation needs, providing flexibility and fostering customisation.

The European e-Competence Framework purpose is to provide general and comprehensive e-Competences that can then be adapted and customised into different ICT business contexts.

## The four dimensions of the e-CF

The European e-Competence Framework is structured from four dimensions. These dimensions reflect different levels of business and human resource planning requirements in addition to job/work proficiency guidelines and are specified as follows:

- **Dimension 1: 5 e-Competence areas**, derived from the ICT business processes PLAN – BUILD – RUN – ENABLE – MANAGE
- **Dimension 2: A set of reference e-Competences for each area**, with a generic description for each competence. **40 competences identified in total** provide the European generic reference definitions of the framework.
- **Dimension 3: Proficiency levels of each e-Competence** provide European reference level specifications on **e-Competence levels e-1 to e-5**.
- **Dimension 4: Samples of knowledge and skills related to the e-Competences** are indicated as optional framework components for inspiration. They are not intended to be exhaustive.

While competence definitions are explicitly assigned to dimension 2 and 3 and the references about knowledge and skills appear in dimension 4 of the framework, attitude is embedded in all three

dimensions. Attitudes are the glue that bind skills, knowledge and experience together to form competence. They provide the motivation for effective and competent performance.

## The e-CF structure

The 40 e-Competences described in Dimension 2 and Dimension 3 of the European e-Competence Framework arise from the 5 e-Competence areas shown in Dimension 1.

The 5 e-Competence areas that were identified are:

- A. PLAN
- B. BUILD
- C. RUN
- D. ENABLE
- E. MANAGE

These e-Competence areas reflect the ICT Business process and its main sub-processes, from a very general perspective.

PLAN, BUILD and RUN are core areas whilst ENABLE and MANAGE are cross-cutting issues referred and related to the former.

PLAN and ENABLE represent strategic areas, within companies that conceive, decide, design and set up products, services, actions and policies. BUILD, concerned with the development and implementation of product/ services/ solutions, and RUN, focused on the provision, support and maintenance of the product/ services/ solutions delivered/ deployed, on the other hand provide operative sub-processes where companies act and do things. Finally, MANAGE represents companies' daily business administration and improvement.

The ICT Business Processes were essentially used for developing the structure of the e-Competence Framework. They were very useful for identifying, distinguishing and assigning the first competence examples. However, the concept of "business processes" is very generic. Therefore in practice



assigning a competence to a specific process, like PLAN or MANAGE is not an exact science and it plays a less important role in the completed and applied e-CF than during its development.

Accordingly, Dimension 2 identifies and describes a set of key e-Competences for each defined e-Competence area. These e-Competence sets are not exhaustive; nonetheless they provide a basic, clear and sound orientation for companies who need to take decisions about recruitment, career paths, training, assessment, etc.; and also for people to understand companies' competence needs.

Furthermore, descriptions in Dimension 2 provide general and comprehensive explanations of the reference e-Competences. These explanations are detailed in Dimension 3 through e-Competence proficiency level specifications. e-Competence level specifications cover only relevant proficiency levels for each competence descriptor in dimension 2. For example, e-Competence level specifications within the areas PLAN and ENABLE are positioned on higher levels than those inside the other e-Competence Areas.

## e-CF to EQF level relationship

The European e-Competence Framework aligns to EQF (European Qualifications Framework) categories for reference purposes. However, as an industry-addressed competence framework the e-CF uses descriptors for ICT professional competence and not for qualifications. In consequence the level descriptors differ between the EQF and European e-CF.

The European e-Competence Framework relates to competences as needed and applied at the workplace. It has 5 e-Competence levels defined. These **competence proficiency levels e-1 to e-5** are related to the **EQF learning levels 3 to 8**; EQF Level 1 and 2 are in this context not relevant.

The EQF and e-CF levels are not identical as the perspectives are different. While the EQF reflects a qualifications perspective, the e-CF adopts a workplace competence perspective. However, both perspectives are interrelated as qualifications contribute to competence development. The table below provides a level relationship between the two frameworks.

e-CF Level	related to EQF Level
e-5	8
e-4	7
e-3	6
e-2	4 and 5
e-1	3

**Table 1: The 5 e-Competence levels of the European e-CF and their relationship to EQF levels 3-8**

As previously mentioned, the difference between the two types of levels can be illustrated by using an example of a person with a Ph.D., this would be EQF level 8. However he or she is not automatically able to apply knowledge, skills and attitudes in a working situation at e-Competence level 5. The competence for a particular job implies more than having achieved a qualification. It also requires experience and proven level of ability to act in complex situations.

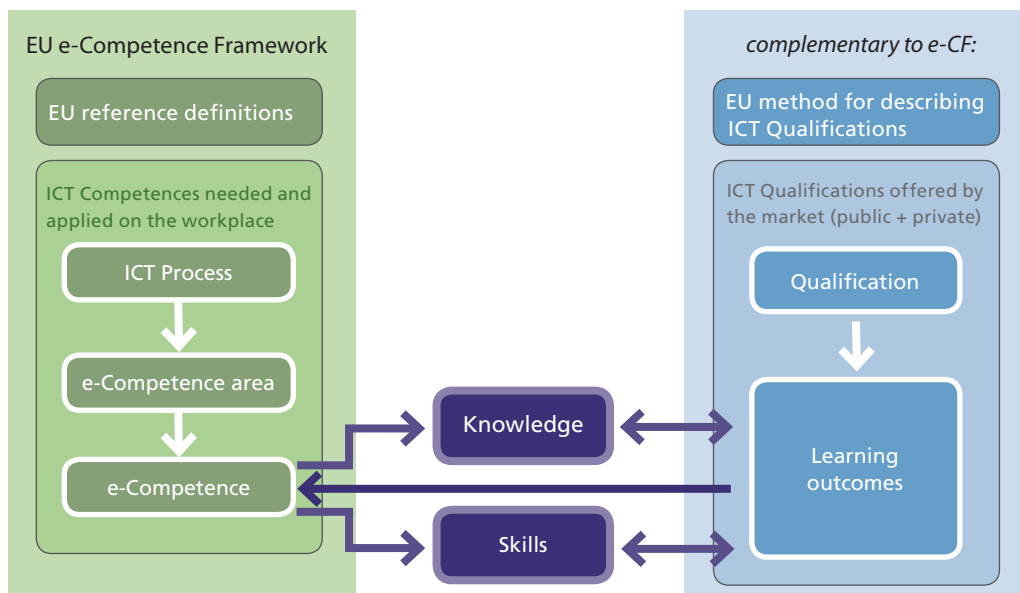
Moreover, whilst EQF levels represent learning levels with a progression from level 1 to level 8, e-CF levels are proficiency levels. That means, they represent the meaningful levels of proficiency that a competence can reasonably express. Hence, a competence can usually be expressed with no more than 3 e-levels. Some competences make sense at higher levels only, on the contrary, some others only at the lower ones.

## Dimension 4 connection to ICT professional education

Dimension 4 provides samples of knowledge and skills included in each e-Competence identified and defined in dimensions 2 and 3. Accordingly, dimension 4 details examples of core elements / components related to the contents of the e-Competences. From this perspective, the depth of analysis in this dimension could be considered too detailed for company needs. Nonetheless, such in-depth descriptions can for example be useful to define

specific and precise outcomes to be assessed within companies' competence assessment sessions.

On the other hand, dimension 4 is critical for training and certification institutions because they need to specify qualifications in terms of learning outcomes. In this context, skills and knowledge can represent both e-competences and the learning outcomes to be reached through learning / training paths. Consequently, skills and knowledge represent a bridge between organisation competences and vocational training and qualifications.



**Figure 2: Links between e-CF competences and ICT qualification offers can be easily established by the framework dimension 4, making explicit knowledge and skills.**

In general, ways of detailing e-competences and making them applicable to specific environments are choices based upon an organisations vision and strategy. The same can be said for training institutions. The choices made in delineating qualifications into skills and knowledge and thus into learning outcomes establishes differentiation between one education and training programme and another. Organisational

choices related to skills and knowledge developments provide a competitive key to address business success. Thus the European e-Competence Framework cannot and should not replace an organisation's decision making process but can provide a foundation to work from.

## 4. e-CF, a shared European reference for adaption to specific needs

### Case studies

To support e-CF application within multiple environments, a series of illustrative case studies provide examples, benefits and hints of how to make best use of the e-CF.

They relate to practical e-CF application experiences and have been elaborated together with e-CF applying organizations Europe-wide.

All case studies have been published as Part 4 of the European e-Competence framework version 3.0 CWA. They are published in digital brochure format and can be downloaded from the e-CF website.

The below table provides an overview of the case studies published together with their respective key perspectives on e-CF application.

Case study	Title	Key perspectives
A	e-CF in large ICT demand organizations	<ul style="list-style-type: none"> <li>Job profile creation</li> <li>Internal ICT staff development</li> <li>Cross company and cross border common language</li> </ul>
B	e-CF in a corporate/ ICT supplier environment	<ul style="list-style-type: none"> <li>e-CF for consultants</li> <li>Identifying training needs</li> <li>Training development</li> <li>Competence gap identification</li> </ul>
C	e-CF for SME's – competence need analysis and managerial dashboard	<ul style="list-style-type: none"> <li>Application in a micro enterprise environment</li> <li>e-CF as a marketing aid</li> <li>e-CF as a business development tool</li> <li>Competence need analysis</li> <li>Linking business strategy and competence development</li> <li>Develop or buy new competences</li> <li>e-CF for SME consultants</li> </ul>
D	SME competence assessment and business card creation based upon the e-CF	<ul style="list-style-type: none"> <li>SME competence self-assessment</li> <li>Business card creation</li> <li>Business capability</li> <li>e-CF for SME consultants</li> </ul>
E	e-CF to build SME job descriptions	<ul style="list-style-type: none"> <li>Job description development</li> <li>Intercompany communication</li> <li>Recruitment aid</li> </ul>
F	e-CF for qualification providers	<ul style="list-style-type: none"> <li>Matching education supply to market needs</li> <li>The difference between competence development and traditional learning</li> <li>Student motivation from a competence approach</li> <li>EQF and e-CF compliance</li> </ul>
G	e-CF in a certification environment	<ul style="list-style-type: none"> <li>Matching certification supply to market needs</li> <li>Increasing transparency in the European e-Skills landscape</li> </ul>
H	e-CF for ICT professional self-assessment	<ul style="list-style-type: none"> <li>Self-assessment</li> <li>CV / Self promotion</li> </ul>

Case study	Title	Key perspectives
I	e-CF for linking e-curricula supply and demand	<ul style="list-style-type: none"> <li>Competence connected to learning outcomes</li> <li>e-CF and EQF compliance</li> <li>Personal career development</li> <li>Competence based e-curriculum</li> </ul>
K	e-CF for ICT professional associations	<ul style="list-style-type: none"> <li>Assessment</li> <li>Benchmark criteria</li> <li>Community building</li> </ul>
L	e-CF for ICT training quality improvement	<ul style="list-style-type: none"> <li>Specialised competences</li> <li>Specialist role development</li> <li>Matching education supply and demand</li> </ul>
M	e-CF for assessment and career tools	<ul style="list-style-type: none"> <li>Assessing an ICT professional's capability</li> <li>Recognition of formal and informal learning</li> </ul>
N	e-CF for National and EU policy makers	<ul style="list-style-type: none"> <li>Ensuring qualified ICT workforce in a long-term</li> <li>Communication between policy makers and ICT business</li> <li>e-Curricula building</li> <li>Cross-European common language</li> </ul>
O	e-CF to relate or integrate to other frameworks	<ul style="list-style-type: none"> <li>e-CF use in an established structure</li> <li>Relating the e-CF to other frameworks</li> <li>Relating workplace and qualification perspective by EQF and e-CF</li> </ul>
P	e-CF for European ICT professional Profiles creation	<ul style="list-style-type: none"> <li>Including competence into a job Profile</li> <li>Communication between HR, management and ICT professionals</li> <li>Building and linking local profiles to a recognised European structure</li> </ul>

Table 2: 15 e-CF case studies covering multiple ICT sector perspectives – overview

## Plan, develop and manage competences in a broader environment: companies and public sector, in particular ICT HR and competence managers

Competence management, people development and HR planning are valuable components of employee management within companies and the public sector.

At a minimum each employee should have:

- *In an existing role*, a clear description of the position to which he/ she is assigned, including a mission statement, responsibilities, activities, outcomes, performance indicators and resources/ experience/ certifications required to perform the job correctly.

- *In a new role*, a competence assessment to measure the gap between his/her knowledge, skills and experience and those required by the position. When necessary, an individual development plan is established to fill the gaps.

At a more intensive level of people management, the following points are relevant:

- Position descriptions derive from part of one or several job profile structures; each job profile including the levels of required competence.
- Each job profile is part of a career path, allowing employees to understand progression routes.
- HR strategy and annual individual objectives derived from company needs (or ambitions).



- Individual development plans taking into consideration annual individual objectives.
- Using training catalogues, a training plan is created from consolidation of combined individual development plans.

The 4 dimensions of the European e-Competence Framework support the employee and the competence management process on multiple levels. As the figure shows, it provides a consistent level of granularity and continuity.

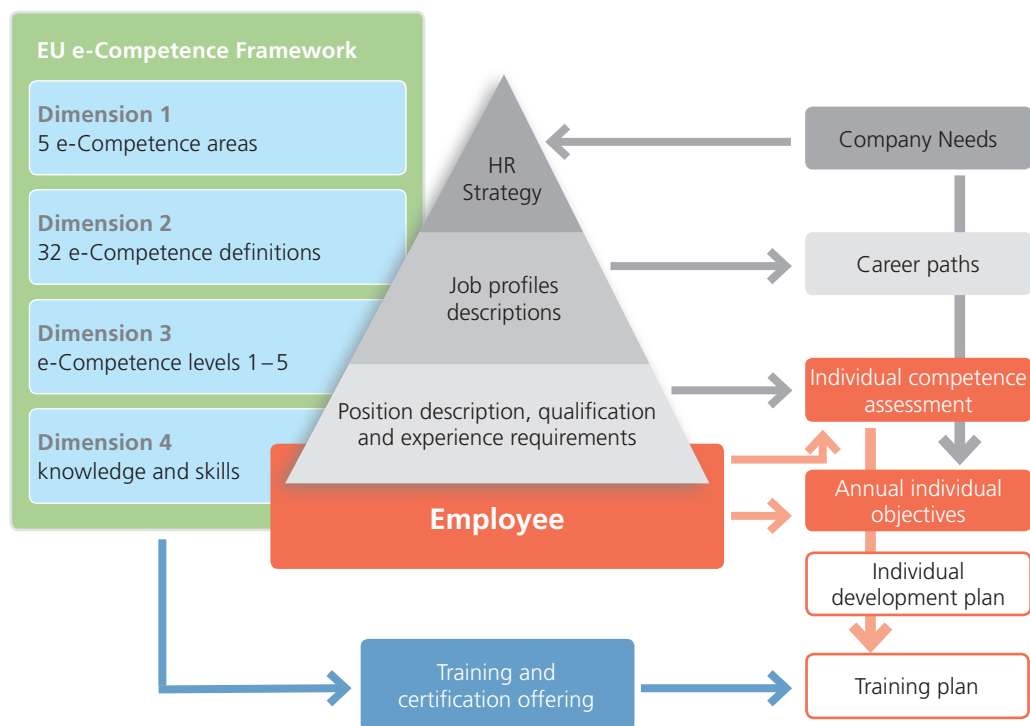


Figure 3: The use of the European e-Competence Framework is multiple within ICT organisations

For further practical illustrations see:

Case study	Title	Key perspectives
A	e-CF in large ICT demand organizations	<ul style="list-style-type: none"> <li>■ Job profile creation</li> <li>■ Internal ICT staff development</li> <li>■ Cross company and cross border common language</li> </ul>
B	e-CF in a corporate/ ICT supplier environment	<ul style="list-style-type: none"> <li>■ e-CF for consultants</li> <li>■ Identifying training needs</li> <li>■ Training development</li> <li>■ Competence gap identification</li> </ul>

## Framework benefits for small and medium sized enterprises (SMEs)

There are differences between ICT SMEs and larger organisations when considering the application of competences. Such differences are more related to business approach than size. In particular, agile SMEs focused on continuous improvement and innovations are likely e-CF target groups.

However, size may influence:

- the type of e-competences considered as relevant for the organisation; namely, the smaller the enterprise, the smaller its interest in standardization and formalization of internal processes;
- the perspective of e-competence application and use. The smaller the enterprise, the greater the interest in e-competences, for internal business purposes;
- the e-CF as an internal tool becomes more and more relevant when size increases.

In this ICT SME context, types of e-CF application may be as follows:

1. self assessment, addressing people, the organization, the company as such;
2. company presentation to clients, as a business card;
3. support company growth, as a compass, a managerial dashboard.

The key perspectives of the possible e-CF applications mentioned above can be summarized as follows:

- Competence need analysis tool
- Marketing aid
- Competence development tool linked consistently to the business strategy

Mapping skills and competence with the e-CF is straightforward. Enterprises may access standard e-CF vocabulary and definitions and if doubts arise, consult the e-CF user-guidelines or check with the official e-CF website where FAQs and answers are available.

For small IT enterprises, it is very useful to demonstrate ownership of competences required to fulfill client demands. Customers no longer look for

technical skills only, they seek business partners able to work in teams, manage projects and processes, and able to communicate.

The e-CF describes such skills within full competence descriptions. Using the e-CF, enterprises are able to describe technical and soft competences inclusively, a key ability when managing relationships with other companies and stakeholders, as it enhances the quality of communication.

Therefore the e-CF is an effective tool to help SMEs identify, articulate and communicate their complex 'know-how'.

Moreover, Dimension 2 of the e-CF can support SMEs in identifying e-competences that describe their core activities and their business. The e-CF provides the structure and appropriate articulation by which management can analyse current competence capability, future requirements and support the development of business strategy.

Generally, the SME start point for use of the e-CF is analysis of Dimension 2. Some guiding questions to help navigate the e-CF, for e-competence need analysis, linked to the business strategy, are as follows:

- Is this competence coherent with my business?
- Have I ever fully practiced this competence?
- If I haven't, for what business aims would it be useful?

The aim is to analyze the relevance of e-competences to the mission and strategy, recording whether such e-competences are currently prevalent within the company or not and at which "intensity"; high, medium, low.

If the exercise is aimed at building a business card for clients, then for each e-competence identified as prevalent in the company at a high level, the entrepreneur and staff need to list specific evidence illustrating those e-competences. The evidence examples may be products/services; developed projects; examples of clients, etc. Then the entrepreneur and staff should also be able to identify assessment criteria to evaluate their e-competences.

The task of identifying assessment criteria is supported by the e-CF as the operational descriptions implicitly include the way of evaluating them.

Finally, to make ICT SMEs more familiar with navigating the e-CF, the entry point to reach the 40 e-competences does not need to follow Dimension 1, Plan, Build, Run, Enable and Manage but may deploy an alternative route using:

1. Company Overview
2. Markets and Customers
3. Innovation and Research
4. Business environment and business competences



This functional view of e-CF competences is also available on-line: <http://profiletool.ecompetences.eu/>

To each of these four categories a set of e-competences has been related. So, for example, in category 2. (Markets and Customers) the following e-competences are grouped:

- A.2. Service Level Management
- B.5. Documentation Production
- C.1. User Support
- C.2. Change support
- C.3. Service delivery
- C.4. Problem management

For further practical illustrations see:

Case study	Title	Key perspectives
C	e-CF for SME's – competence need analysis and managerial dashboard	<ul style="list-style-type: none"> <li>■ Application in a micro enterprise environment</li> <li>■ e-CF as a marketing aid</li> <li>■ e-CF as a business development tool</li> <li>■ Competence need analysis</li> <li>■ Linking business strategy and competence development</li> <li>■ Develop or buy new competences</li> <li>■ e-CF for SME consultants</li> </ul>
D	SME competence assessment and business card creation based upon the e-CF	<ul style="list-style-type: none"> <li>■ SME competence self-assessment</li> <li>■ Business card creation</li> <li>■ Business capability</li> <li>■ e-CF for SME consultants</li> </ul>
E	e-CF to build SME job descriptions	<ul style="list-style-type: none"> <li>■ Job description development</li> <li>■ Intercompany communication</li> <li>■ Recruitment aid</li> </ul>

## A European dimension of competence description

In the first instance the European e-Competence Framework establishes a European common language for ICT competences. It also supports the definition of jobs, training courses, qualifications, career paths, formal and non-formal learning paths, certifications etc. in the ICT related business areas. In this way, local, national, European and global ICT vendor and user companies have access to a shared reference. In addition, national ICT frameworks can be linked to the e-Competence Framework and gain a European dimension:

- National ICT competence frameworks, qualification systems, job profiles etc become comparable to competence frameworks, qualification systems, job profiles from other countries;
- National ICT competence frameworks, qualification systems, job profiles etc receive guidance on how to link, to implement the EQF into a specific business area, being linked by the EQF-levels to the e-Competence levels;
- ICT competences and proficiency levels become comparable to competences of other business areas and sectors in Europe.

Before comparing the European e-Competence Framework to other ICT frameworks, ICT qualification systems or anything else that might be similar to a framework (referred below as a frame), it may be useful to answer a few questions:

- What is the focus and the target of the frame?
- What are the main principles? What is the context of the frame?
- What is the subject-matter of the frame? Which elements are used and classified? Is it competence, qualifications, job profiles, learning outcomes, higher education or something else?
  - Which level is used for describing the elements? Which level of abstraction is used?
  - What about the granularity of the elements?
  - Is there more than one level of description? (for example: titles, short descriptions, long descriptions)
- How to build the structure of the frame? Which dimensions are used for classifying the elements?
  - What are the references for the dimensions? (for example: content, levels of proficiency, benchmarks)
  - For every dimension: Is it uni- or multidimensional?
  - How about the relationship between the dimensions? Are they independent?
- Are there further application or guiding documents (for example: instructions, how to categorise elements)?

The answers can be compared with the characteristics of the European e-Competence Framework, as explained in this document, thus enabling linkage.

### Added value to existing frameworks – examples SFIA, CIGREF, AITTS, EUCIP

For existing frameworks the European e-Competence Framework provides added value. The European dimension allows transparency, comparability and the creation of European knowledge areas. It will “facilitate trans-national mobility for workers and learners and contribute to meeting the requirements of supply and demand in the European labour market” [from the EQF-document, 23 April 2008].

Existing national or local ICT frameworks differ from each other and are embedded in specific environments; they can link to the European reference Framework in individual ways. The following four examples give an idea of possible approaches and the potential for application of the common European e-Competence Framework to existing frameworks. The four framework examples are for illustration, they are not exhaustive.

## Example 1: The United Kingdom developed “SFIA – Skills framework for the information age”

SFIA provides a common reference model for the identification of the skills needed to develop effective information systems (IS) making use of information and communications technologies (IT). It is a simple and logical two dimensional framework consisting of areas of work on one axis and levels of responsibility on the other. The overall purpose of SFIA is to assist organisations employing IT professionals to ensure that the right skills are developed and deployed to best effect to

- reduce IT project risk,
- retain staff,
- make recruitment effective,
- enhance the effectiveness and efficiency of the IT function and
- provide appropriate development and career paths for IT professionals.

SFIA uses a common language and a sensible, logical structure that can be used to facilitate the processes of skills development in all businesses using or providing Information Technology. It is easily understood by IT practitioners, managers, HR professionals, employers, education and training providers and government personnel.

There are 96 skills described in SFIA version 5 and these can be deployed at a range of up to 7 levels (1= follow, 2 = assist, 3 = apply, 4= enable, 5= ensure, advise, 6= initiate, influence, 7 = set strategy, inspire, mobilise). Each level is defined by the autonomy, influence, complexity and amount of business skill deployed. The SFIA descriptions are reviewed periodically to ensure that they are up to date and meet the needs of the IT Industry.<sup>5</sup>

Linking SFIA skills to the European e-Competence Framework can be straightforward. It is possible to link the 7 levels of the SFIA Framework to the 5 e-competence levels of the e-CF. Using the table below SFIA skills can be consistently related, from a level perspective, to the competences defined within dimension 3 of the e-CF.

See the table that follows:

SFIA Level	SFIA Level Descriptor	abbreviated e-CF Level Descriptor	e-CF Level
7	Set strategy inspire, mobilise	Overall accountability and responsibility	5
6	initiate, influence, ensure	Extensive scope of responsibility	4
5	advise	Respected for innovative methods and use of initiative	3
4	enable		
3	apply	Operates with capability and independence in specified boundaries	2
2	assist	Able to apply knowledge and skills to solve straight forward problems	1
1	follow	Not Applicable	none

**Table 3: Linking SFIA skills to the European e-Competence Framework**

<sup>5</sup> Text adapted from the SFIA website [www.sfia.org.uk](http://www.sfia.org.uk). See there for detailed descriptions of skills deployed at each level.



## Example 2: The French “CIGREF framework on job profiles”

The CIGREF nomenclature presents a set of ICT occupations grouped into families that are used in most information system departments of major French companies. It is a tool that was built by consensus among HR professionals. Companies use it as template to build their own repository by adding their own specifications.

The template includes:

- a title and other common names used in organizations,
- a mission describing the purpose of the job,
- a description of significant activities and tasks,
- the skills needed classified into three distinct categories: IT skills, general skills and attitudes.

In 2002, CIGREF had identified the need to simplify and standardise the list of knowledge and skills: The introduction of the e-Competence Framework and its four dimensions responded to this need.

The links between the European e-Competence Framework and the CIGREF framework can be made by using the dimension 2 for describing activities and by using dimension 3 for describing competences required to perform the job correctly.

Consequently, the latest version of the CIGREF framework published in 2012 was adapted: using e-Competence dimension 2, activities were described with more consistency and by using the dimension 3, knowledge and skills were replaced by competences, making it easier to understand.

This approach provided simplified job profiles and where necessary, it is possible to obtain more detail by using the link between dimension 3 and 4, i.e. knowledge and skills associated to the corresponding level of competence.

This linkage between the CIGREF framework and the e-CF is illustrated below.

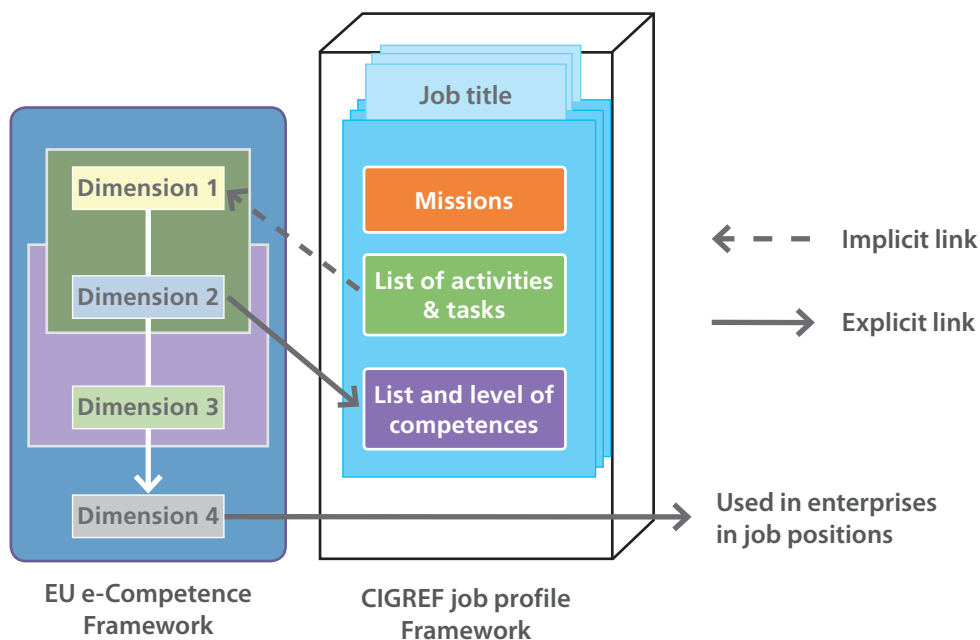


Figure 4: Linkage between the CIGREF job profile framework and the e-CF

## Example 3: The German “AITTS – Advanced IT Training System”

AITTS is a system of career profiles associated to three levels of proficiency (completed by a fourth basic level, the IT occupations from the German “dual system”). AITTS provides both, a competence and qualifications framework, as it comes additionally with a methodology for workflow embedded qualification.

The system of profiles and the methodology for qualification are linked by reference processes: described work processes that serve simultaneously as a reference for the particular job role and its curriculum. These reference processes are extensive and detailed curricula for each career profile. They have been worked out in co-operation with more than 60 representatives from the ICT industry and training

providers. There, the structure of the learning content is decided not on the basis of a formal organisation of the subject, but rather on the basis of the work process.

Linking AITTS profiles to the European e-Competence Framework is initially easy, as both are structured from business and working processes. Additionally, the main target of AITTS is to advance the capability of ICT employees in the workplace and this is very close to the e-CF definition of competence.

Most AITTS profiles are composed of more than one competence. They are integrated into the German system of occupations and offer a wide range of opportunities to obtain jobs by enhancing qualifications and competences.

See some examples below:

AITTS 'level'	German Profiles	linked to / composed of e-Competences	e-CF level
Operative Professionals	IT Business Manager	A.4 Product Planning	3
		D.5 Sales Proposal Development	3-4
		D.8 Contract Management	3
		D.9 Digital Marketing	3
		D.12 Personnel Development	3-4
		E.2 Project and Portfolio Management	3
		E.3 Risk Management	3
		E.5 Process Improvement	3
		E.6 ICT Quality Management	3
		E.7 Business Change Management	3
			<i>if applicable some other and some more (not part of the e-CF)</i>
Specialists	IT Project Coordinator	D.5 Sales Proposal Development	2
		E.2 Project and Portfolio Management	2-3
		E.3 Risk Management	2
		E.6 ICT Quality Management	2
		E.8 Information Security Management	2
	<i>(if applicable some other)</i>		
IT Occupations (German Dual System)	IT specialist in application development	A.6 Application Design	1
		B.1 Application Development	2
		B.2 Component Integration	2
		B.3 Testing	1
		B.4 Solution Deployment	1-2
		B.5 Documentation Production	1-2
		C.1 User Support	1
		E.2 Project and Portfolio Management	2
	<i>(if applicable some other)</i>		

Table 4: Linking German AITTS and IT Occupation profiles to the European e-Competence Framework (For detailed AITTS profile descriptions see “Die deutschen IT Aus- und Weiterbildungsberufe im europäischen e-Competence Framework”. IG Metall 2010)

## Example 4: The European Certification Model for ICT Professionals EUCIP

The current EUCIP model provides for the definition and measurement of ICT skills and is currently used as the basis for the provision of certification and services in seven countries across Europe. The EUCIP certification program, which was developed by The Council of European Professional Societies (CEPIS), is a professional certification and competency development scheme, aimed at informatics professionals and practitioners<sup>6</sup>.

EUCIP and the e-Competence Framework have common features and interesting potential synergies (see figure 6 below). The e-CF, as a common, accepted reference point for ICT professional competences, has the potential to be an important input into the future evolution of EUCIP and its associated certification and service offering.

- e-CF Dimension 4 (Knowledge and Skills) link to EUCIP Competence Categories and more detailed topics. Referring to granularity of e-CF Dimension 4, EUCIP provides more in depth detail at this level finalized to support activities such as assessment.

- e-CF Dimension 3 (Proficiency) articulates analytically levels for each e-Competence that in EUCIP levels are defined as general classes of knowledge and skill depth.
- e-CF Dimension 2 (e-Competences) are statements of competence that are linked to EUCIP elective profile Tasks and can offer a more structured and process oriented framework of job tasks definition.
- e-CF Dimension 1 (e-Competence areas) coincide with EUCIP knowledge areas and outline additional supporting processes (Enable and Manage) embedded in EUCIP core areas.

EUCIP's high level of granularity is useful for training departments to design and develop curricula and learning initiatives. It can provide detailed guidelines to identify knowledge and skill topics.

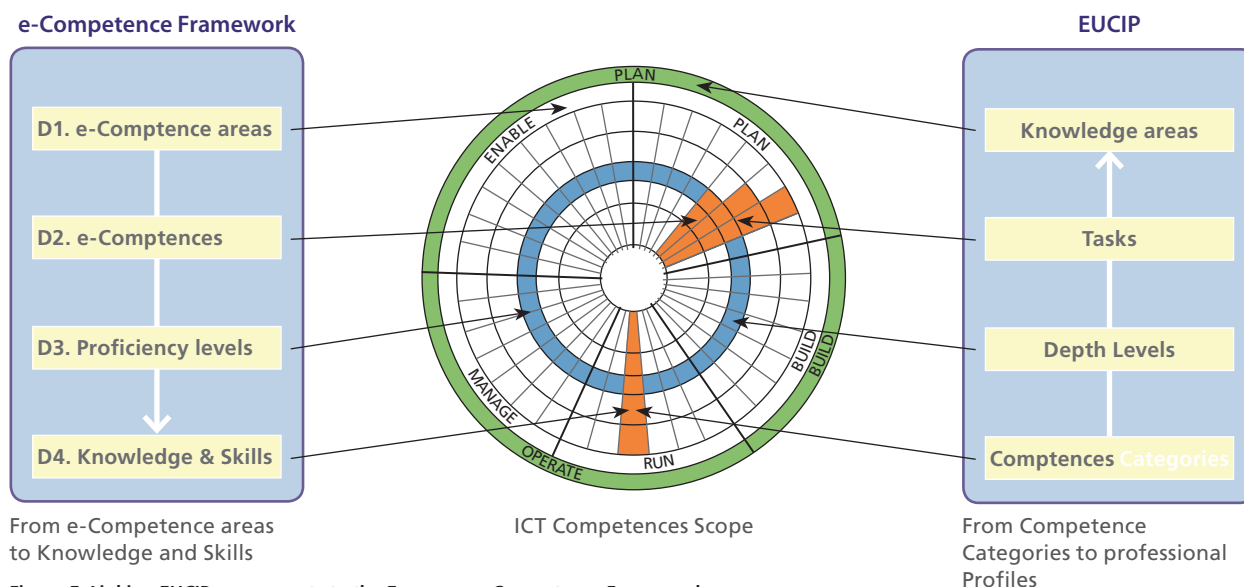


Figure 5: Linking EUCIP components to the European e-Competence Framework

<sup>6</sup> For all relevant information around EUCIP see: [www.eucip.org](http://www.eucip.org)

The 21 profiles that make up EUCIP Professional have moved to Version 3.0.

The detailed competences set out in these profiles have been revised to reflect what individuals operating in these profiles should be able to do in the current technological and business environment. Importantly, the profiles have been updated to include references to the European e-Competence Framework.

Consequently, the official EUCIP 3.1 documents (i.e. the current version, released in 2011) explicitly references to the e-CF in various sections.

In order to place the EUCIP Professional Profiles in the context of certain frameworks and schemes, specific references, where relevant, are provided at the end of each profile. The following frameworks or schemes are referenced (see section 1.3 of the current EUCIP version 3.1): e-CF, SFIA, CIGREF, AITTS, Borsa Lavoro.

The European e-Competence Framework is seen as particularly important as it is intended to act as a European-level point of reference for a broad range of activities including practitioner continuous professional development.

One of the strategic objectives of EUCIP is to provide a detailed competence scheme that sits under and references the competences set out in the e-CF in order to provide a range of certifications and services to IT professionals and industry across Europe.

At last, each EUCIP profile identifies a subset of the 36 e-CF competences to allow a fully e-CF based description of competence requirements.

The following table summarizes e-CF competences associated with each EUCIP Profile.

**Table 5: Overview of e-CF competences associated with the EUCIP Profiles**

	IS Manager	IS Auditor	Security Adviser	IS Project Manager	Data Centre & Configuration Manager *	Business Analyst	IS Analyst	IT Systems Architect	Telecommunications Architect*	Software Developer	Web & Multimedia Master*	Systems Integration & Testing Engineer	Database Manager	IT Administrator**	Network Manager*	X-Systems Engineer	Help Desk Supervisor	Client Manager	IT Trainer	Enterprise Solutions Consultant*	Logistics&Automation Consultant*	Sales & Application Consultant	
A. PLAN	A.1. IS and Business Strategy Alignment	1			1	1	1						1		1		1			1	1		
	A.2. Service Level Management	1			1								1		1		1						
	A.3. Business Plan Development	1				1																	
	A.4. Product or Project Planning						1	1													1	1	
	A.5. Architecture Design	1				1		1													1	1	
	A.6. Application Design				1		1	1		1		1	1										
	A.7. Technology Watching				1		1	1	1		1								1		1	1	
	A.8. Sustainable Development					1		1															
B. BUILD	B.1. Design and Development				1				1	1	1				1	1							
	B.2. Systems Integration				1																1	1	
	B.3. Testing			1			1		1	1		1											
	B.4. Solution Development								1	1	1						1				1	1	
	B.5. Documentation Production								1	1	1	1								1			
C. RUN	C.1. User Support													1	1	1	1						
	C.2. Change Support				1			1						1	1	1							
	C.3. Service Delivery				1			1															
	C.4. Problem Management													1	1	1	1						
D. ENABLE	D.1. Information Security Strategy Development		1	1																			
	D.2. ICT Quality Strategy Development		1																				
	D.3. Education and Training Provision																			1			
	D.4. Purchasing				1	1																	
	D.5. Sales Proposal Development																						1
	D.6. Channel Management																			1			1
	D.7. Sales Management																			1			1
	D.8. Contract Management	1																1	1				1
	D.9. Personnel Development																			1			
	D.10. Information and Knowledge Management												1										
E. MANAGE	E.1. Forecast Development																		1				1
	E.2. Project and Portfolio Management				1																		
	E.3. Risk Management		1	1																			
	E.4. Relationship Management																						
	E.5. Process Improvement		1		1		1	1												1			1
	E.6. ICT Quality Management		1	1																			
	E.7. Business Change Management	1	1				1												1		1		
	E.8. Information Security Management				1										1								
	E.9. IT Governance	1	1																				

The four examples from national environments of the United Kingdom, France and Germany as well as from Europe show that it is possible to link different kinds of frameworks to the European e-Competence Framework.

- to the requirements of the different countries,
- to the requirements of the various companies and organisations,
- to technological evolutions for the next few years,
- to future services.

The European e-Competence Framework therefore establishes a European standard which is sufficiently generic to be adaptable:

For further practical illustrations see:

Case study	Title	Key perspectives
O	e-CF to relate or integrate to other frameworks	<ul style="list-style-type: none"> <li>■ e-CF use in an established structure</li> <li>■ Relating the e-CF to other frameworks</li> <li>■ Relating workplace and qualification perspective by EQF and e-CF</li> </ul>

## e-CF – an inspiration for new national/ local ICT frameworks

Encouraging examples from Estonia and Canada show that for new national or local ICT frameworks, the European e-Competence Framework can provide a standard directly adopted or adapted to meet specific cultural contexts and need.

Before using the European e-Competence Framework as a standard for developing a local ICT framework it is useful to address a few questions. The first step is to clarify intended targets and purposes of the local framework (for helpful suggestions and questions look at 4.2). The second is to decide about adopting or adapting the European Framework or parts of it. For this purpose it is useful to consider the following:

- Is it possible to compare the typical processes from local ICT companies to the processes used in the e-CF (in the categories plan, build, run, enable, manage)?
  - To answer this question it might be helpful to look at the (typical) business processes of local ICT companies and at the adopted national or international standards for ICT product and/or service development and maintenance (e.g. CMMI, ITIL)

- In which ICT areas (look at dimension 1 of the e-CF) do local ICT companies operate?
  - The focus of the e-CF is on processes and competences in the areas of *Software Infrastructure, System Integration, Communication equipment and services*. For other areas such as *Microelectronics/ Components/ Semiconductors, Computing hardware or Industrial Control Systems* it may be necessary to modify or amend competences.
- What national, local, economic, social or cultural characteristics exist that make it necessary to modify the competence descriptions or the level descriptions from the e-CF?
- Are relationships from the modified European e-Competence Framework to existing qualifications, training or national/local educational system possible and helpful?
  - If learning outcomes are orientated on competences, linking to e-CF may be straightforward.



Using the European e-Competence Framework to link to formal and informally acquired qualifications is straightforward if they are orientated towards competence. From a competence perspective it is unimportant from when and where a qualification is awarded or how many study hours are involved. Competence demands demonstrable capability obtained through a combination of experience, formal or informal acquired abilities/skills and knowledge.

The European e-Competence Framework can be used as a reference model for recognising competence informally acquired by ICT practitioners and professionals through their career.



For further practical illustrations see:

Case study	Title	Key perspectives
N	e-CF for National and EU policy makers	<ul style="list-style-type: none"> <li>■ Ensuring qualified ICT workforce in a long-term</li> <li>■ Communication between policy makers and ICT business</li> <li>■ e-Curricula building</li> <li>■ Cross-European common language</li> </ul>

## e-CF reference for qualifications, training and certification

The European e-Competence Framework also provides an input for educational and vocational training and certification institutions.

The Bologna process (1999) expressed its programmatic intention of generating “a new enhanced European co-operation” especially focused on higher education and employability. In addition, the Bruges-Copenhagen Process (2001-2002) promoted transparency, mobility and inter-institutional co-operation to strengthen vocational education and training as well as the recognition of competences and qualifications.

Accordingly, the European e-CF is a consistent way of connecting companies to schools, universities and training institutions: thus promoting Europe-wide inter-institutional co-operation. The European e-CF demonstrates industry competence needs and educational and training institutions can be informed by the e-CF when constructing and designing training programmes.

Moreover, the European e-Competence Framework provides a consistent link to the European Qualifications Framework (EQF) because the e-competence descriptions are in line with the EQF learning outcomes-based language. It therefore also supports mutual understanding and communication between industry and education and training systems.

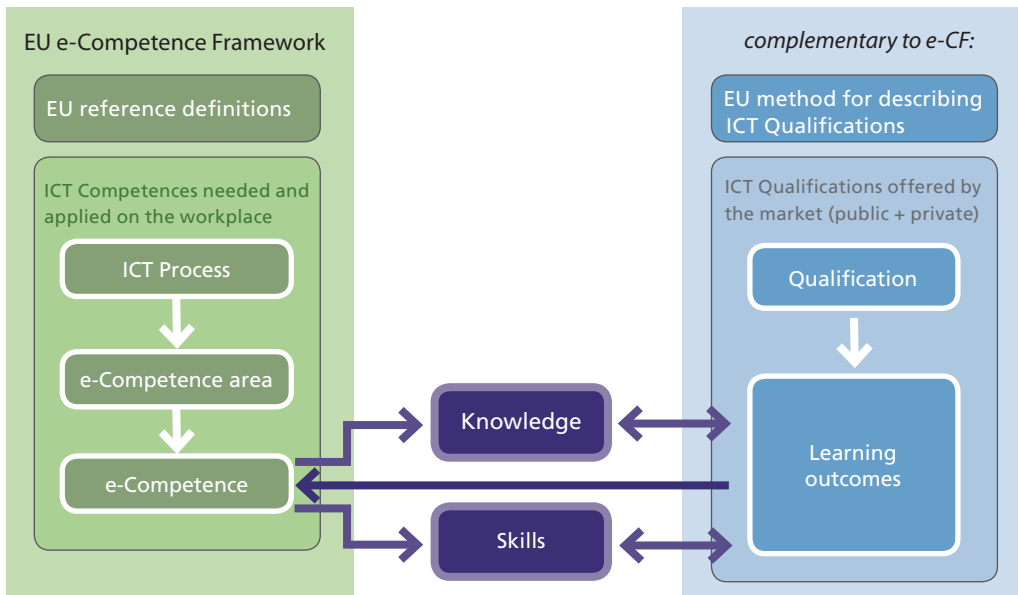


Figure 6: Links between e-CF competences and ICT qualification offers can be easily established by the framework dimension 4, making explicit knowledge and skills.

In the figure below the possible role of the European e-CF to support and inspire new training processes is highlighted.

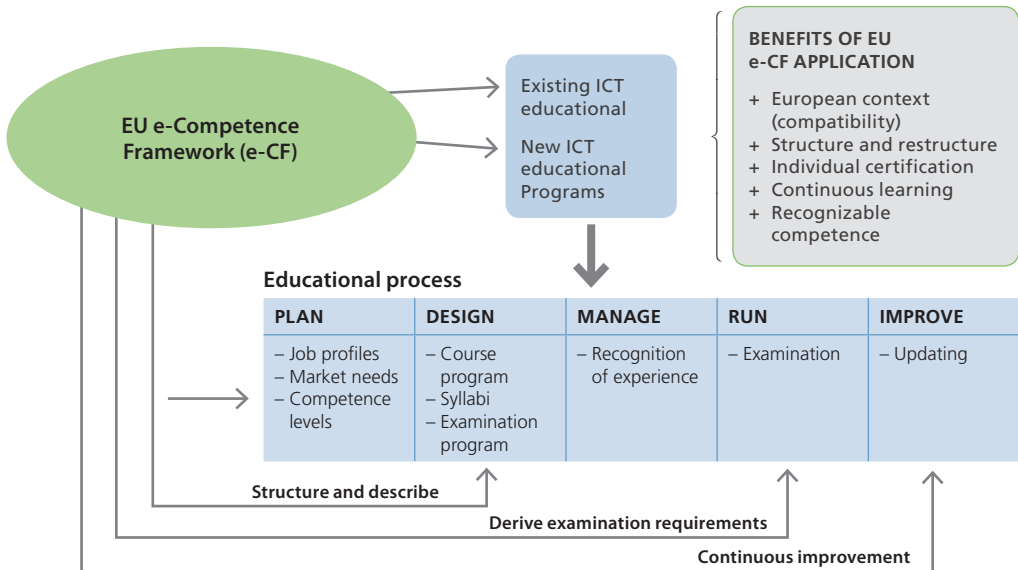


Figure 7: EU e-CF application by ICT education, training and certification institutes (public and private)

For further practical illustrations see:

Case study	Title	Key perspectives
<b>F</b>	e-CF for qualification providers	<ul style="list-style-type: none"> <li>■ Matching education supply to market needs</li> <li>■ The difference between competence development and traditional learning</li> <li>■ Student motivation from a competence approach</li> <li>■ EQF and e-CF compliance</li> </ul>
<b>G</b>	e-CF in a certification environment	<ul style="list-style-type: none"> <li>■ Matching certification supply to market needs</li> <li>■ Increasing transparency in the European e-Skills landscape</li> </ul>
<b>I</b>	e-CF for linking e-curricula supply and demand	<ul style="list-style-type: none"> <li>■ Competence connected to learning outcomes</li> <li>■ e-CF and EQF compliance</li> <li>■ Personal career development</li> <li>■ Competence based e-curriculum</li> </ul>

## ICT professional career development

The European e-Competence Framework provides a pragmatic competence overview of the European ICT labour market from industry and public sector perspectives.

The framework can be used by individuals to self assess and articulate a personal competence profile. This may then be compared with a European job role defined in e-CF competence terminology.

Consequently, individual competence gaps can be used to focus personal development on areas for improvement. This activity may be driven by personal motivation or through collaboration within an employers structured personal development programme.

To practically support this an on-line tool is available: <http://profiletool.ecompetences.eu/>

For further practical illustrations see:

Case study	Title	Key perspectives
<b>K</b>	e-CF for ICT professional associations	<ul style="list-style-type: none"> <li>■ Assessment</li> <li>■ Benchmark criteria</li> <li>■ Community building</li> </ul>
<b>L</b>	e-CF for ICT training quality improvement	<ul style="list-style-type: none"> <li>■ Specialised competences</li> <li>■ Specialist role development</li> <li>■ Matching education supply and demand</li> </ul>
<b>M</b>	e-CF for assessment and career tools	<ul style="list-style-type: none"> <li>■ Assessing an ICT professional's capability</li> <li>■ Recognition of formal and informal learning</li> </ul>

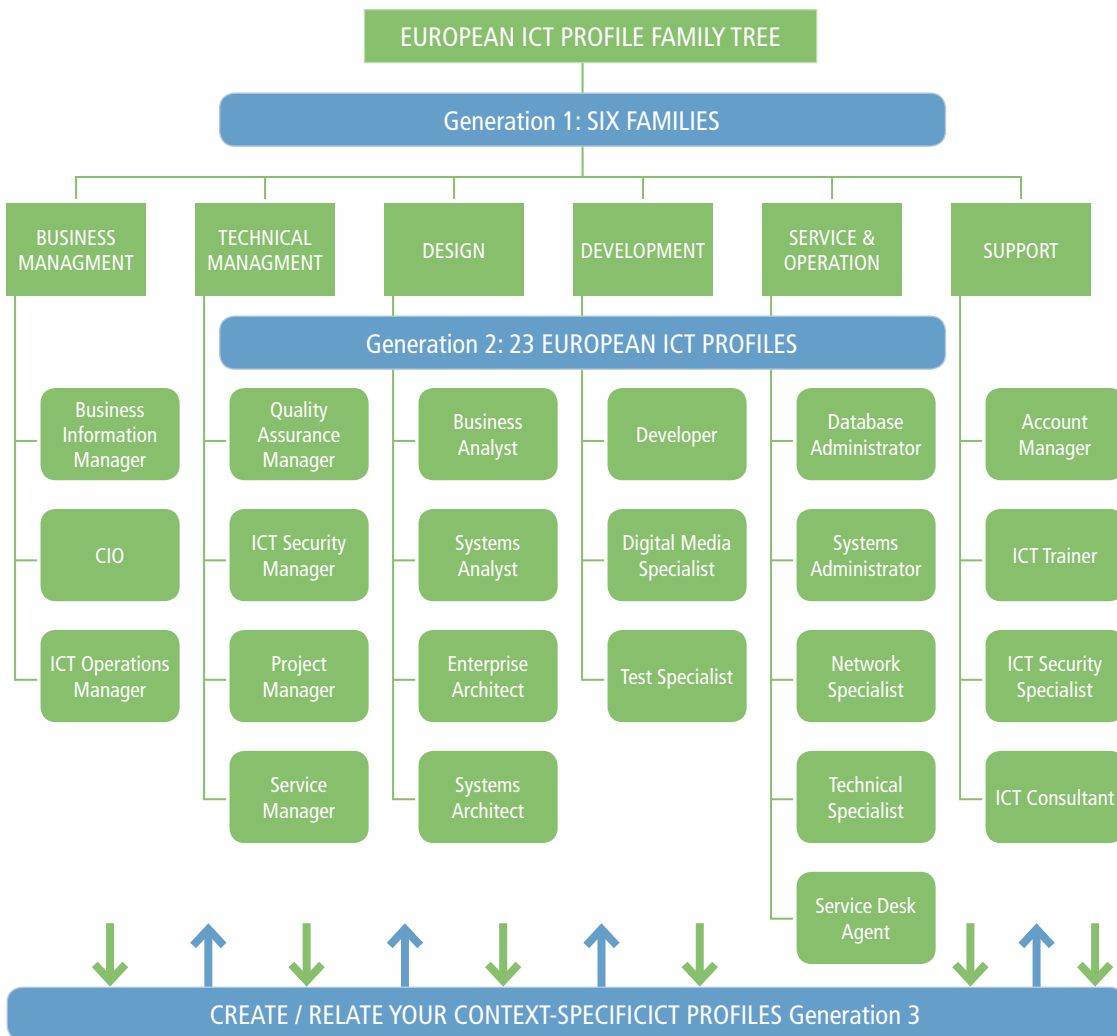
## e-CF for HR planning and job profiles development

The competences provided by the European e-Competence Framework can be used as bricks for building job profiles according to specific company and work place needs.

Complementary to the European e-Competence Framework, the CEN ICT Skills Workshop has

developed a set of typical European ICT Professional Profiles which can be used for reference and adapted to ICT related to specific contexts, e.g. at National, regional, sub-sector, or company level.

The following figure shows the graphical overview of all profiles defined and their positioning within the European environment.



**Figure 8: 23 European ICT Professional Profiles in 6 families – Top of a European Profile family tree**  
(Source: CWA 16458:2012, updated in 2013 by e-CF 3.0 competences)

The Profile “Quality Assurance Manager” shows an example of how these profiles were defined; the e-CF competences are a key component of this.

<b>Profile title</b>	<b>QUALITY ASSURANCE MANAGER (16)</b>		
<b>Summary statement</b>	Ensures that Information Systems are delivered according to organizational policies (quality, risks, Service Level Agreement).		
<b>Mission</b>	Establishes and operates an ICT quality approach compliant with the organization's culture. Ensures that management controls are correctly implemented to safeguard assets, data integrity and operations. Is focused and committed to the achievement of quality goals and monitors statistics to forecast quality outcomes.		
<b>Deliverables</b>	<b>Accountable</b>	<b>Responsible</b>	<b>Contributor</b>
	<ul style="list-style-type: none"> <li>Audit report</li> </ul>	<ul style="list-style-type: none"> <li>Quality performance indicators</li> </ul>	<ul style="list-style-type: none"> <li>Quality assurance</li> <li>ICT quality policy</li> <li>Risk management policy</li> <li>Information security policy</li> </ul>
<b>Main task/s</b>	<ul style="list-style-type: none"> <li>Establish and deploy the ICT quality policy</li> <li>Organize and provide quality training</li> <li>Provide ICT managers with quality performance indicators</li> <li>Perform quality audits</li> <li>Organize customer satisfaction surveys</li> <li>Assist project team members to build and perform project quality plans</li> </ul>		
<b>e-competences</b> <i>(from e-CF)</i>	D.2. ICT Quality Strategy Development		Level 4–5
	E.3. Risk Management		Level 3
	E.5. Process Improvement		Level 3
	E.6. ICT Quality Management		Level 4
<b>KPI area</b>	Achievement of company quality goals		

Table 6: EU ICT Professional Profiles example “Quality Assurance Manager” built upon the e-CF (Source: CWA 16458:2012)

For further practical illustrations see:

Case study	Title	Key perspectives
A	e-CF in large ICT demand organizations	<ul style="list-style-type: none"> <li>Job profile creation</li> <li>Internal ICT staff development</li> <li>Cross company and cross border common language</li> </ul>
E	e-CF to build SME job descriptions	<ul style="list-style-type: none"> <li>Job description development</li> <li>Intercompany communication</li> <li>Recruitment aid</li> </ul>
O	e-CF to relate or integrate to other frameworks	<ul style="list-style-type: none"> <li>e-CF use in an established structure</li> <li>Relating the e-CF to other frameworks</li> <li>Competences and job profiles</li> <li>Relating workplace and qualification perspective by EQF and e-CF</li> </ul>
P	e-CF for European ICT professional Profiles creation	<ul style="list-style-type: none"> <li>Including competence into a job Profile</li> <li>Communication between HR, management and ICT professionals</li> <li>Building and linking local profiles to a recognised European structure</li> </ul>



## e-CF in support of recruitment and sourcing

Using the European e-Competence Framework as a core reference for ICT recruiting and sourcing processes can facilitate improved and efficient correlation between competence demand from recruiting and/ or sourcing companies and competence supply from job seekers and the ICT supply side.

Within companies, the recruiting process usually involves at least three interested parties:

- Line management responsible for the person to be recruited. They need to define as precisely as possible the job in terms of mission statements, responsibilities, activities, work environment and, of course, the required competences and qualifications.
- An HR representative, who must define the compensation in relationship with HR policies (level of responsibility, expected career evolution...) and with the evolution of the job position.
- Potential applicants (internal or external), who need to clearly understand the specification of the job, the company, compensation and, benefits.

Communication between these three parties is a key issue influencing the effectiveness and success of the recruitment process.

The European e-Competences Framework provides a common and concise language for those involved in recruitment:

- Dimension 1 and 2 can be used to define the scope of the job.
- Dimension 3 can be used to define the required competences and proficiency level.
- Dimension 4 can be used to highlight some particular knowledge and skills required and to design assessment sessions.

The use of an internationally shared competence language in job advertisements supplied by employers and recruiters and understandable by job seekers would increase transparency and efficiency of the HR recruitment process.

Using the European e-Competence Framework for competence profiling in online job portals, could also benefit employers, recruitment agencies and job seekers by sharing a common language.

For further practical illustrations see:

Case study	Title	Key perspectives
A	e-CF in large ICT demand organizations	<ul style="list-style-type: none"> <li>■ Job profile creation</li> <li>■ Internal ICT staff development</li> <li>■ Cross company and cross border common language</li> </ul>
E	e-CF to build SME job descriptions	<ul style="list-style-type: none"> <li>■ Job description development</li> <li>■ Intercompany communication</li> <li>■ Recruitment aid</li> </ul>
O	e-CF to relate or integrate to other frameworks	<ul style="list-style-type: none"> <li>■ e-CF use in an established structure</li> <li>■ Relating the e-CF to other frameworks</li> <li>■ Competences and job profiles</li> <li>■ Relating workplace and qualification perspective by EQF and e-CF</li> </ul>

## e-CF supporting understanding of learning paths and training offers

As the European e-CF provides guidance for ICT education and training systems, it can also provide a useful reference for young people, employees and job seekers. Individuals who intend to improve their competences or to retrain according to industry requirements may refer to the European e-CF as a guide. The e-CF offers a clear picture of competence related to business areas and proficiency levels.

In addition, e-Competence can be related to training and qualification programmes as the European e-CF language is in line with EQF learning outcomes-based recommendations. Consequently, individuals can see opportunities for personal growth aided by the European e-CF, and also select appropriate training programmes.

For further practical illustrations see:

Case study	Title	Key perspectives
H	e-CF for ICT professional self-assessment	<ul style="list-style-type: none"> <li>■ Self-assessment</li> <li>■ CV / Self promotion</li> </ul>

## ICT skills and competence planning for policy makers, industry sector associations and market watchers

The European e-Competence Framework provides a European standard reference for communicating competence needs in a transnational and European ICT environment. It articulates knowledge, skills and competence as needed and applied in the ICT workplace for the ICT vendor and user industry as well as in the public sector.

The e-Competence definitions of the Framework may therefore be used and understood as a shared international reference. In practise the e-CF supports sector associations, policy makers, market surveyors and further players and institutions involved in anticipating, evaluating and planning ICT skills and competence needs in a long-term perspective across the European ICT Sector.

For further practical illustrations see:

Case study	Title	Key perspectives
N	e-CF for National and EU policy makers	<ul style="list-style-type: none"> <li>■ Ensuring qualified ICT workforce in a long-term</li> <li>■ Communication between policy makers and ICT business</li> <li>■ e-Curricula building</li> <li>■ Cross-European common language</li> </ul>

## 5. The e-CF Profile Enabling Tool

To support users of the European e-Competence Framework a simple online tool has been developed which enables the creation of e-CF profiles. This user friendly tool is accessible, using any common browser, via the European e-competence framework website at [www.ecompetences.eu](http://www.ecompetences.eu)

The objective of the tool is to bring to life the content of e-CF version 3.0 and provide linkage to the EU ICT Professional profiles that are the subject of CWA 16458. Furthermore, the subject matter of the e-CF and the ICT Professional profiles are presented in multiple languages broadening access to a wider population. In addition e-CF users are presented with two navigation options to access e-CF content; the traditional e-CF view and a function view. (see chapter 4, p. 21, for a more detailed explanation)

Framework elements from each dimension of the e-CF can be collected in a „pick and mix“ format to create a user generated profile. These profiles may be structured using the users preferred orientation. For instance, job profile creation may be of primary interest to employers, whereas education profiles (curriculum, certification, qualification etc.) may be of value to training and education institutions.

User defined profiles can be labelled as required, e.g. „Company X help desk competence profile“, or any other title, and subsequently the created profile saved and/ or printed. Navigation tabs and click boxes support simple selection of dimension elements including required proficiency levels.

Comparisons between user created profiles and any of the 23 the established ICT professional profiles can also be made to support identification of skills gaps.

ICT profile none		e-CF view   ICT profile   Compare   Print report   Language   Select all   Clear				
Dimension 1	Dimension 2	Dimension 3				
5 e-Competence areas (A-E)	36 e-Competences identified	e-Competence proficiency levels identified for each competence (related to ECF levels 3-5)				
		e-1	e-2	e-3	e-4	e-5
- A. PLAN	A.1. IS and Business Strategy Alignment					
	A.2. Service Level Management					
	A.3. Business Plan Development					
	A.4. Product or Project Planning					
	A.5. Architecture Design					
	A.6. Application Design					
	A.7. Technology Watching					
	A.8. Sustainable Development					
- B. BUILD	B.1. Design and Development					
	B.2. Systems Integration					
	B.3. Testing					
	B.4. Solution Deployment					
	B.5. Documentation Production					
- C. RUN	C.1. User Support					
	C.2. Change Support					
	C.3. Service Delivery					
	C.4. Problem Management					
- D. ENABLE	D.1. Information Security Strategy Development					
	D.2. ICT Quality Strategy Development					
	D.3. Education and Training Provision					
	D.4. Purchasing					
	D.5. Sales Proposal Development					
	D.6. Channel Management					

Use of the online tool is free of charge and the simple web site design philosophy requires no specific security measures as profiles are not centrally filed or stored on line and no data is analysed.

Figure 9: The e-CF profile enabling tool – screenshot <http://profiletool.ecompetences.eu/>

## 6. Use of ICT sector terminology in the e-CF version 3.0

The e-CF does not establish new definitions; e-CF good practice is to apply existing definitions in a way that stakeholders clearly understand and that add value to the articulation of competence descriptions.

The following are examples of ICT sector related terminology used within the e-CF, accompanied by the descriptions/ definitions adopted based upon common usage.

### Cloud Computing

Cloud Computing is primarily a data storage solution without constraint of size, regardless of the medium and able to return information as a service regardless of place.

The Cloud computing model is able to address the three layers of the commonly used service model : IaaS (Infrastructure as a Service), PaaS (Platform as a Service) and SaaS (Software as a Service).

In Technical terms, a Cloud is a virtual space carried on one or more servers, disposed in one or multiples locations. It contains multiples fragments of information, which are duplicated and distributed in virtual space. A specific application is required to recreate the information and deliver it as a service.

In terms of typology, there are four categories of Cloud Computing, organized around the usage (Private or open to partners, public or others) and the management (managed by the organization or by a supplier, outside the organization):

1. for private use, with an internal management (I manage my own Cloud)
2. for open use, with an internal management (I manage a Cloud and propose services to others)
3. for a private use, with an external management (I use a Cloud managed by a supplier)
4. for an open use, with an external management (I propose to others, as my customers, to use a Cloud managed by a supplier)

In economic terms, with Cloud Computing, the notion of consumption prevails over the concept of use: you buy a subscription, a license to consume, not a license to use.

### e-leadership

Within the e-CF context, e-leadership is used as a specific expression of leadership.

The “e” is used as an all-inclusive acronym relating to combinations of ICT and business, including all technical ICT fields, all business fields and activities by enterprises or people in developing, using, supplying, servicing etc. and related to all competences on all levels.

The combination of ‘e’ and leadership in the e-CF means: the ability to initiate and to instigate innovative processes by convincing others to collaborate and to apply entrepreneurial spirit in support of transformational processes driven by technology.

## ICT Information and Communication Technology

The abbreviation ICT stands for Information and Communication Technology. It is used in many different contexts and from a technical point of view ICT related to digital computers and internet (communication) systems, including software, hardware and networks. From an economic and political point, ICT relates to a cross sector of enterprises, including manufactures, supplier or service providers related to the technical ICT field.

## Information security

Information Security is the ongoing process of exercising due care and diligence to protect information, and information systems, from unauthorized access, use, disclosure, destruction, modification, disruption or distribution. The never-ending process of information security involves ongoing training, assessment, protection, monitoring & detection, incident response & repair, documentation, and review. The consequences of failure make information security an indispensable part of all the business operations across multiple domains" (*backed by current standards, ISO27000 and US*)

## Leadership

The e-CF uses the word 'leadership' in its general accepted meaning, as defined in the Oxford English Dictionary, 'the action of leading a group of people or an organization, or the ability to do this'. Competence descriptors incorporating 'leadership' are normally to be found at levels 4 and 5 in the e-CF where responsibilities for people and influence over others are required. This is usually expressed as follows, 'provides leadership' meaning that the competence involves not only possessing the appropriate knowledge and skills but also the ability to inspire others to follow within a competence field.

## Lean Management and People Management

"Lean management is the sum of thought, methods and procedures for the management without waste along the entire value chain in order to meet current and future customer expectations".  
<http://www.leancenter.it/LeanManagement/tabid/75/language/it-IT/Default.aspx>

## Legal matters: IPR and data protection

**Legal matters** are not explicitly enshrined in the e-CF but there are two issues that are of particular relevance to the ICT Professional/Management community: IPR and data protection. ICT Professionals/Managers must ensure that they comply with national and international laws relating to these matters.

**IPR** is a legal concept that relates to ideas and concepts of human intellectual creativity for which exclusive rights are recognized. National laws grant originators exclusive rights to intangible assets, such as inventions and designs. The main categories of these rights are copyright, patents, trademarks, design and retention of confidential information.

**Data Protection** laws have been enacted to control how organizations, business or governments use personal data. National laws establish a framework of rights and duties that are designed to safeguard personal data. Data protection laws balances the legitimate needs of organisations to collect and use personal data for business and other purposes against the right of individuals to respect for the privacy of their personal details.



## Mobility

Mobility reflects the ability to exchange information without the sender or receiver being subjected to any constraint of place (anywhere), of content (anything), of time (anytime), of media (any device), of number or availability of stake holders (anybody).

Mobility enables exchange of anything from anywhere for anybody with any device at anytime

Technically mobility relies on all communications networks with Internet access. It also uses specific equipment such as smartphones, laptops or tablets, which have the ability to stay connected permanently to the Internet

From process perspective, mobility can deport work processes at different locations to answer specific situations. *(from CIGREF report)*

## Innovation

For the OECD, “innovation differs from an invention or discovery to the extent that it is part of an application perspective “

The invention, is a process which is constrained only by the inventive capacities of inventors and by the available resources (money, human or material resources) to realize them. Invention calls for proliferation and human creativity. The present system is then disrupted and reorganized taking into account the new invention. It is at this moment that we have the innovation.

Innovation transforms virtual invention into an economic and industrial reality. It leads to a process of new practice which leads to effective use; It is a passage to the act. *(from CIGREF report)*

The concept of innovation covers a set of processes :

- the discovering and identifying of an idea
- the writing of multiple business plans to transform this idea in a solution or product (human, finance, sponsor, users, perimeter; need targeted...)
- the evaluation and prioritization of the different solutions described in business plans
- the building of a „proof of concept“ to validate one or more chosen solutions
- the management of the technology transfer to operational teams
- the follow of the development and integration of the solution
- The capitalization on the success or the failure of the transformation of the initial idea.

In that way, innovation can be a competence: to be able to innovate is the capability to oversee and to manage all these specifics processes from initial idea to final product, in a coherent approach to answer a need.

## Annex: European e-CF and EQF level table

Beside of concepts explicitly elaborated for the European e-Competence Framework, the table contains description elements of 1) The European Qualifications Framework for Lifelong Learning (EQF), April 2008 and 2) The PROCOM Framework, of which generic job titles have been reproduced by kind permission of e-Skills UK.

EQF levels	EQF Levels descriptions	e-CF Levels	e-CF Levels descriptions	Typical Tasks	Complexity	Autonomy	Behaviour
8	Knowledge at the most advanced frontier, the most advanced and specialised skills and techniques to solve critical problems in research and/or innovation, demonstrating substantial authority, innovation, autonomy, scholarly or professional integrity.	e-5	<b>Principal</b> Overall accountability and responsibility; recognised inside and outside the organisation for innovative solutions and for shaping the future using outstanding leading edge thinking and knowledge.	IS strategy or programme management	Unpredictable – unstructured	Demonstrates substantial leadership and independence in contexts which are novel requiring the solving of issues that involve many interacting factors.	Conceiving, transforming, innovating, finding creative solutions by application of a wide range of technical and/or management principles.
7	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking, critical awareness of knowledge issues in a field and at the interface between different fields, specialised problem-solving skills in research and/or innovation to develop new knowledge and procedures and to integrate knowledge from different fields, managing and transforming work or study contexts that are complex, unpredictable and require new strategic approaches, taking responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams.	e-4	<b>Lead Professional / Senior Manager</b> Extensive scope of responsibilities deploying specialised integration capability in complex environments; full responsibility for strategic development of staff working in unfamiliar and unpredictable situations.	IS strategy/ holistic solutions		Demonstrates leadership and innovation in unfamiliar, complex and unpredictable environments. Addresses issues involving many interacting factors.	
6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles, advanced skills, demonstrating mastery and innovation in solving complex and unpredictable problems in a specialised field of work or study, management of complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts, for continuing personal and group professional development.	e-3	<b>Senior Professional / Manager</b> Respected for innovative methods and use of initiative in specific technical or business areas; providing leadership and taking responsibility for team performances and development in unpredictable environments.	Consulting	Structured – unpredictable	Works independently to resolve interactive problems and addresses complex issues. Has a positive effect on team performance.	Planning, making decisions, supervising, building teams, forming people, reviewing performances, finding creative solutions by application of specific technical or business knowledge/skills.
5	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge, expertise in a comprehensive range of cognitive and practical skills in developing creative solutions to abstract problems, management and supervision in contexts where there is unpredictable change, reviewing and developing performance of self and others.	e-2	<b>Professional</b> Operates with capability and independence in specified boundaries and may supervise others in this environment; conceptual and abstract model building using creative thinking; uses theoretical knowledge and practical skills to solve complex problems within a predictable and sometimes unpredictable context.	Concepts/ Basic principles		Works under general guidance in an environment where unpredictable change occurs. Independently resolves interactive issues which arise from project activities.	
4	Factual and theoretical knowledge in broad contexts within a field of work or study, expertise in a range of cognitive and practical skills in generating solutions to specific problems in a field of work or study, self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change, supervising the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.				Structured – predictable	Scheduling, organising, integrating, finding standard solutions, interacting, communicating, working in team.	
3	Knowledge of facts, principles, processes and general concepts, in a field of work or study, a range of cognitive and practical skills in accomplishing tasks. Problem solving with basic methods, tools, materials and information, responsibility for completion of tasks in work or study, adapting own behaviour to circumstances in solving problems.	e-1	<b>Associate</b> Able to apply knowledge and skills to solve straight forward problems; responsible for own actions; operating in a stable environment.	Support/ Service	Structured – predictable	Demonstrates limited independence where contexts are generally stable with few variable factors.	Applying, adapting, developing, deploying, maintaining, repairing, finding basic-simple solutions.

## European e-Competence Framework version 3.0

The European e-Competence Framework 3.0 has been published by CEN as CWA 16234 Part 1, 2, 3 and 4 in 2014; the CWA is available from the CEN Members and can also be downloaded from the CEN website: [www.cen.eu](http://www.cen.eu)

The European e-Competence Framework is a component of the European Union's strategy on «e-Skills for the 21<sup>st</sup> Century». It is also supporting key policy objectives of the «Grand Coalition for Digital Jobs» launched in March 2013. It is promoted as a very useful tool to boost digital skills and the recognition of competences and qualifications across countries and to foster ICT professionalism in Europe.

Visit the European e-Competence Framework website: [www.ecompetences.eu](http://www.ecompetences.eu)  
Create an e-CF Profile: <http://profiletool.ecompetences.eu/>

## CEN Workshop on ICT Skills

The CEN Workshop on ICT Skills is a network of experts representing the ICT industry, academic institutions, vocational training organisations, ICT professional associations, social partners and research institutions.

The workshop aims to promote excellence in the ICT sector and strengthen the ICT profession through the creation of relevant supporting standards that can be applied throughout Europe and around the world.

All CEN Workshop Agreements (CWAs) in the field of ICT Skills can be found on the CEN website (under Sectors > ICT).

## About CEN



CEN (European Committee for Standardization) is one of the three officially recognised organisations responsible for developing and defining standards at European level – together with CENELEC (European Committee for Electrotechnical Standardization) and ETSI (European Telecommunications Standards Institute). CEN develops European Standards setting out specifications and procedures in relation to a wide range of products and services.

The members of CEN are the National Standards Bodies of 33 European countries including all of the European Union member states, three countries of the European Free Trade Association (Iceland, Norway and Switzerland) and two EU candidate countries (Turkey and the former Yugoslav Republic of Macedonia). European Standards (ENs) approved by CEN are accepted and recognised in all of these countries.

For more information, please see [www.cen.eu](http://www.cen.eu) and [www.cencenelec.eu](http://www.cencenelec.eu)

The European e-Competence Framework version 3.0 work was supported by the European Commission, Directorate General Enterprise and Industry, and the European Free Trade Association.



## About The Grand Coalition

The Grand Coalition will help accelerate and intensify efforts initiated by European policies, such as the Digital Agenda for Europe, the e-Skills Strategy, the Employment Package, the Opening up Education Initiative, the Rethinking Education Strategy, the Youth Opportunities Initiative, and the EU Skills Panorama. For more information about the Grand Coalition, priorities please see:

<https://ec.europa.eu/digital-agenda/en/grand-coalition-digital-jobs-0>

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The European e-Competence Framework (e-CF) version 3.0 provides a reference of 40 competences as required and applied at the Information and Communication Technology (ICT) workplace, using a common language for competences, skills and capability levels that can be understood across Europe. As the first sector-specific implementation of the European Qualifications Framework (EQF), the e-CF was created for application by ICT service, user and supply companies, for managers and human resource (HR) departments, for education institutions and training bodies including higher education, for market watchers and policy makers, and other organizations in public and private sectors.

The e-CF was developed through a process of collaboration between experts and stakeholders from many different countries under the umbrella of the CEN Workshop on ICT Skills. The e-CF is a component of the European Union's strategy for e-Skills in the 21<sup>st</sup> Century. The framework supports key policy objectives of the Grand Coalition for digital Jobs and benefits an ever growing user community from the EU and across the world.

[www.ecompetences.eu](http://www.ecompetences.eu)

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