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

European e-Competence Framework 3.0

A common European framework for ICT Professionals in all industry sectors

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 organisations in public and private sectors.

Further complementary materials available:

- User guide for the application of the European e-Competence Framework (e-CF) version 3.0 (CWA Part 2)
- 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/

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Annex 1: Abbreviations used within the e-CF

CMMI	capability maturity model integration
COBIT	control objectives for information and related technology
CPD	continuing professional development
CSR	corporate social responsibility
DBMS	database management systems
DSS	data storage sever
IaaS	infrastructure as a service
ICT	information and telecommunication technology
IDE	integrated development environment
IDL	interface definition languages
IPR	intellectual property rights
IS	information systems [in the broad understanding of including software, hardware, data, people, procedures and business processes] see: https://en.wikipedia.org/wiki/Information_systems, especially the „Overview“
ISO	international standardisation organisation
ITIL	Information technology infrastructure library
KPI	key performance indicators
PaaS	platform as a Service
RAD	rapid application development
SaaS	software as a Service
SLA	service level agreement
SWOT	strengths, weaknesses, opportunities and threats [analysis]
VAR	value-added resellers

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).

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 organisations 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.

- **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.

Introduction to the e-CF version 3.0

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. System 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: à B.1. Application Development and B.6. Systems Engineering
  - This leads to further clarity and refinement of the design element within: A.5. Architecture Design (related to systems) and A.6. Applications Design (related to applications)
  - The development element of the process is further enhanced in: B.1. Application Development (related to applications) and B.6. Systems Engineering (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. 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.

e-CF supporting material

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 guide for the application of the European e-Competence Framework (e-CF) version 3.0 (CWA Part 2)
- 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/**

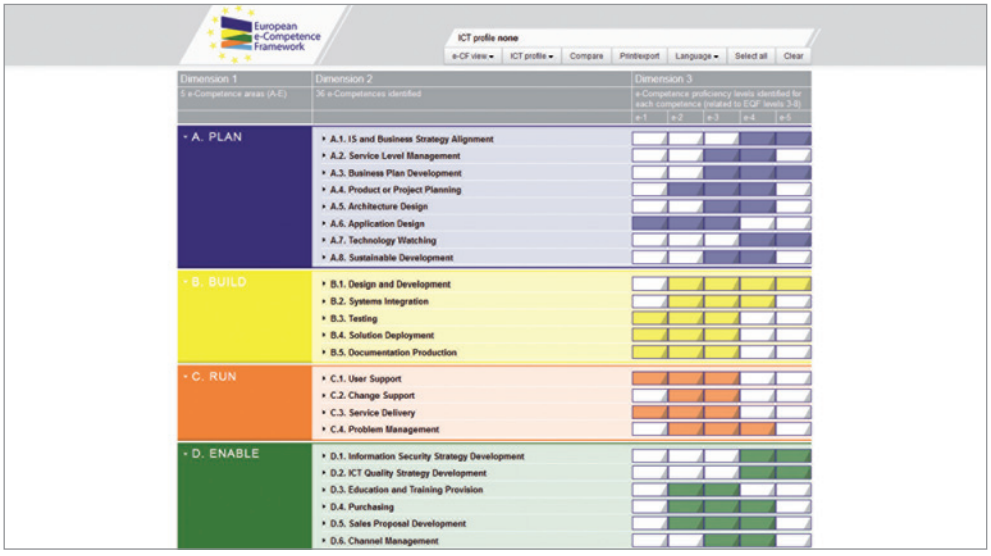

Figure 1 – The e-CF profile enabling tool – screenshot http://profiletool.ecompetences.eu/

Political context and support

The European e-Competence Framework is a component of the long term e-skills agenda "e-skills for the 21st Century" of the European Union supported by the European Commission and The Council of Ministers, and of the "Grand Coalition for Digital Jobs" launched by the European Commission in March 2013 to fill the digital gap.

e-CF structure and look

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 e-CF 3.0.

Dimension 3:
Proficiency levels of each e-Competence provide European reference level specifications on **e-Competence levels e-1 to e-5**, which are related to the EQF levels 3 to 8.

Dimension 4:
Samples of **knowledge and skills** relate to e-Competences in dimension 2. They are provided to add value and context and are not intended to be exhaustive.

Whilst competence definitions are explicitly assigned to dimension 2 and 3 and knowledge and skills samples appear in dimension 4 of the framework, attitude is embedded in all three dimensions.

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				■	■

European e-Competence Framework 3.0 full version

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.1. IS and Business Strategy Alignment** Anticipates long term business requirements, influences improvement of organisational process efficiency and effectivenes. Determines the IS model and the enterprise architecture in line with the organisation's policy and ensures a secure environment. Makes strategic IS policy decisions for the enterprise, including sourcing strategies.				
Dimension 3	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	–	–	–	Provides leadership for the construction and implementation of long term innovative IS solutions.	Provides IS strategic leadership to reach consensus and commitment from the management team of the enterprise.
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 business strategy concepts K2 trends and implications of ICT internal or external developments for typical organisations K3 the potential and opportunities of relevant business models K4 the business aims and organisational objectives K5 the issues and implications of sourcing models K6 the new emerging technologies (e.g. distributed systems, virtualisation, mobility, data sets) K7 architectural frameworks K8 security				
Skills examples *Is able to*	S1 analyse future developments in business process and technology application S2 determine requirements for processes related to ICT services S3 identify and analyse long term user/customer needs S4 contribute to the development of ICT strategy and policy, including ICT security and quality S5 contribute to the development of the business strategy S6 analyse feasibility in terms of costs and benefits S7 review and analyse effects of implementations S8 understand the impact of new technologies on business (e.g. open/big data, dematerialisation opportunities and strategies) S9 understand the business benefits of new technologies and how this can add value and provide competitive advantage (e.g. open/big data, dematerialisation opportunities and strategies) S10 understand the enterprise architecture S11 understand the legal & regulatory landscape in order to factor into business requirements				

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.2. Service Level Management** Defines, validates and makes applicable service level agreements (SLAs) and underpinning contracts for services offered. Negotiates service performance levels taking into account the needs and capacity of stakeholders and business.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Ensures the content of the SLA.	Negotiates revision of SLAs, in accordance with the overall objectives. Ensures the achievement of planned results.	–
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 SLA documentation K2 how to compare and interpret management data K3 the elements forming the metrics of service level agreements K4 how service delivery infrastructures work K5 impact of service level non-compliance on business performance K6 ICT security standards K7 ICT quality standards				
Skills examples *Is able to*	S1 analyse service provision records S2 evaluate service provision against SLA S3 negotiate realistic service level targets S4 use relevant quality management techniques S5 anticipate and mitigate against potential service disruptions				

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.3. Business Plan Development** Addresses the design and structure of a business or product plan including the identification of alternative approaches as well as return on investment propositions. Considers the possible and applicable sourcing models. Presents cost benefit analysis and reasoned arguments in support of the selected strategy. Ensures compliance with business and technology strategies. Communicates and sells business plan to relevant stakeholders and addresses political, financial, and organisational interests.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Exploits specialist knowledge to provide analysis of market environment etc.	Provides leadership for the creation of an information system strategy that meets the requirements of the business (e.g. distributed, mobility-based) and includes risks and opportunities.	Applies strategic thinking and organisational leadership to exploit the capability of Information Technology to improve the business.
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 business plan elements and milestones K2 the present and future market size and needs K3 competition and SWOT analysis techniques (for product features and also the external environment) K4 value creation channels K5 profitability elements K6 the issues and implications of sourcing models K7 financial planning and dynamic K8 new emerging technologies K9 risk and opportunity assessment techniques				
Skills examples *Is able to*	S1 address and identify essential elements of product or solution value propositions S2 define the appropriate value creation channels S3 build a detailed SWOT analysis S4 generate short and long term performance reports (e.g. financial, profitability, usage and value creation) S5 identify main milestones of the plan				

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.4. Product / Service Planning** Analyses and defines current and target status. Estimates cost effectiveness, points of risk, opportunities, strengths and weaknesses, with a critical approach. Creates structured plans; establishes time scales and milestones, ensuring optimisation of activities and resources. Manages change requests. Defines delivery quantity and provides an overview of additional documentation requirements. Specifies correct handling of products, including legal issues, in accordance with current regulations.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1** –	**Level 2** Acts systematically to document standard and simple elements of a product.	**Level 3** Exploits specialist knowledge to create and maintain complex documents.	**Level 4** Provides leadership and takes responsibility for, developing and maintaining overall plans.	**Level 5** –
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 effective frameworks and methodologies for governance plans K2 typical KPI (key performance indicators) K3 basic decision-making methods K4 IPR principles and regulation K5 agile techniques K6 structured Project Management Methodologies (e.g. agile techniques) K7 optimisation methods (e.g. lean management) K8 new emerging technologies				
Skills examples *Is able to*	S1 identify all potential targets for the product or service S2 define the communication plan; identify key users and create related documentation S3 produce quality plans S4 ensure and manage adequate information for decision makers S5 manage the change request process S6 manage the product / service development management lifecycle (inclusive of the formal change request process)				

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.5. Architecture Design** Specifies, refines, updates and makes available a formal approach to implement solutions, necessary to develop and operate the IS architecture. Identifies change requirements and the components involved: hardware, software, applications, processes, information and technology platform. Takes into account interoperability, scalability, usability and security. Maintains alignment between business evolution and technology developments.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Exploits specialist knowledge to define relevant ICT technology and specifications to be deployed in the construction of multiple ICT projects, applications or infrastructure improvements.	Acts with wide ranging accountability to define the strategy to implement ICT technology compliant with business need. Takes account of the current technology platform, obsolescent equipment and latest technological innovations.	Provides ICT strategic leadership for implementing the enterprise strategy. Applies strategic thinking to discover and recognize new patterns in vast datasets and new ICT systems, to achieve business savings.
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 architecture frameworks, methodologies and systems design tools K2 systems architecture requirements: performance, maintainability, extendibility, scalability, availability, security and accessibility K3 costs, benefits and risks of a system architecture K4 the company's enterprise architecture and internal standards K5 new emerging technologies (e.g., distributed systems, virtualisation models, datasets, mobile systems)				
Skills examples *Is able to*	S1 provide expertise to help solve complex technical problems and ensure best architecture solutions are implemented S2 use knowledge in various technology areas to build and deliver the enterprise architecture S3 understand the business objectives/drivers that impact the architecture component (data, application, security, development etc) S4 assist in communication of the enterprise architecture and standards, principles and objectives to the application teams S5 develop design patterns and models to assist system analysts in designing consistent applications				

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.6. Application Design** Analyses, specifies, updates and makes available a model to implement applications in accordance with IS policy and user/customer needs. Selects appropriate technical options for application design, optimising the balance between cost and quality. Designs data structures and builds system structure models according to analysis results through modelling languages. Ensures that all aspects take account of interoperability, usability and security. Identifies a common reference framework to validate the models with representative users, based upon development models (e.g. iterative approach).				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Contributes to the design and general functional specification and interfaces.	Organises the overall planning of the design of the application.	Accounts for own and others actions in ensuring that the application is correctly integrated within a complex environment and complies with user/customer needs.	–	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 requirements modelling and need analysis techniques K2 software developments methods and their rationale (e.g. prototyping, agile methods, reverse engineering, etc.) K3 metrics related to application development K4 user interface design principles K5 languages for formalising functional specification K6 existing applications and related architecture K7 DBMS, Data Warehouse, DSS … etc K8 mobile technologies K9 threat modelling techniques				
Skills examples *Is able to*	S1 identify customers, users & stakeholders S2 collect, formalise and validate functional and no-functional requirements S3 apply estimation models and data to evaluate costs of different software lifecycle phases S4 evaluate the use of prototypes to support requirements validation S5 design, organise and monitor the overall plan for the design of application S6 design functional specification starting from defined requirements S7 evaluate the suitability of different application development methods for the current scenario S8 establish systematic and frequent communication with customers, users and stakeholders S9 ensure that controls & functionality are built in to the design				

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.7. Technology Trend Monitoring** Investigates latest ICT technological developments to establish understanding of evolving technologies. Devises innovative solutions for integration of new technology into existing products, applications or services or for the creation of new solutions.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	–	Exploits wide ranging specialist knowledge of new and emerging technologies, coupled with a deep understanding of the business, to envision and articulate solutions for the future. Provides expert guidance and advice, to the leadership team to support strategic decision-making.	Makes strategic decisions envisioning and articulating future ICT solutions for customer-oriented processes, new business products and services; directs the organisation to build and exploit them.
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 emerging technologies and the relevant market applications K2 market needs K3 relevant sources of information (e.g. magazines, conferences and events, newsletters, opinion leaders, on-line forum, etc.) K4 the rules of discussions in web communities K5 applied research programme approaches				
Skills examples *Is able to*	S1 monitor sources of information and continuously follow the most promising S2 identify vendors and providers of the most promising solutions; evaluate, justify and propose the most appropriate. S3 identify business advantages and improvements of adopting emerging technologies				

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.8. Sustainable Development** Estimates the impact of ICT solutions in terms of eco responsibilities including energy consumption. Advises business and ICT stakeholders on sustainable alternatives that are consistent with the business strategy. Applies an ICT purchasing and sales policy which fulfills eco-responsibilities.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Promotes awareness, training and commitment for the deployment of sustainable development and applies the necessary tools for piloting this approach.	Defines objective and strategy of sustainable IS development in accordance with the organisation's sustainability policy.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 metrics and indicators related to sustainable development K2 corporate social responsibility (CSR) of stakeholders within the IS infrastructure				
Skills examples *Is able to*	S1 monitor and measure the ICT energy consumption S2 apply recommendations in projects to support latest sustainable development strategies S3 master regulatory constraints and international standards related to ICT sustainability				

Dimension 1 e-Comp. area	A. PLAN				
Dimension 2 e-Competence: Title + generic description	**A.9. Innovating** Devises creative solutions for the provision of new concepts, ideas, products or services. Deploys novel and open thinking to envision exploitation of technological advances to address business/society needs or research direction.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	–	Applies independent thinking and technology awareness to lead the integration of disparate concepts for the provision of unique solutions.	Challenges the status quo and provides strategic leadership for the introduction of revolutionary concepts.
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 existing and emerging technologies and market applications K2 business, society and/or research habits, trends and needs K3 innovation processes techniques				
Skills examples *Is able to*	S1 identify business advantages and improvements of adopting emerging technologies S2 create a proof of concept S3 think out of the box S4 identify appropriate resources				

Dimension 1 e-Comp. area	B. BUILD				
Dimension 2 e-Competence: Title + generic description	**B.1. Application Development** Interprets the application design to develop a suitable application in accordance with customer needs. Adapts existing solutions by e.g. porting an application to another operating system. Codes, debugs, tests and documents and communicates product development stages. Selects appropriate technical options for development such as reusing, improving or reconfiguration of existing components. Optimises efficiency, cost and quality. Validates results with user representatives, integrates and commissions the overall solution.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Acts under guidance to develop, test and document applications.	Systematically develops and validates applications.	Acts creatively to develop applications and to select appropriate technical options. Accounts for others development activities. Optimizes application development, maintenance and performance by employing design patterns and by reusing proved solutions.	–	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 appropriate software programs/modules K2 hardware components, tools and hardware architectures K3 functional & technical designing K4 state of the art technologies K5 programming languages K6 Power consumption models of software and/or hardware K7 DBMS K8 operating Systems and software platforms K9 Integrated development environment (IDE) K10 rapid application development (RAD) K11 IPR issues K12 modeling technology and languages K13 interface definition languages (IDL) K14 security				
Skills examples *Is able to*	S1 explain and communicate the design/development to the customer S2 perform and evaluate test results against product specifications S3 apply appropriate software and/or hardware architectures S4 develop user interfaces, business software components and embedded software components S5 manage and guarantee high levels of cohesion and quality S6 use data models S7 perform and evaluate test in the customer or target environment S8 cooperate with development team and with application designers				

Dimension 1 e-Comp. area	B. BUILD				
Dimension 2 e-Competence: Title + generic description	**B.2. Component Integration** Integrates hardware, software or sub system components into an existing or a new system. Complies with established processes and procedures such as, configuration management and package maintenance. Takes into account the compatibility of existing and new modules to ensure system integrity, system interoperability and information security. Verifies and tests system capacity and performance and documentation of successful integration.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Acts systematically to identify compatibility of software and hardware specifications. Documents all activities during installation and records deviations and remedial activities.	Accounts for own and others actions in the integration process. Complies with appropriate standards and change control procedures to maintain integrity of the overall system functionality and reliability.	Exploits wide ranging specialist knowledge to create a process for the entire integration cycle, including the establishment of internal standards of practice. Provides leadership to marshal and assign resources for programmes of integration.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 old, existing and new hardware components/software programs/modules K2 the impact that system integration has on existing system/organisation K3 interfacing techniques between modules, systems and components K4 integration testing techniques K5 development tools (e.g. development environment, management, source code access/ revision control) K6 best practice design techniques				
Skills examples *Is able to*	S1 measure system performance before, during and after system integration S2 document and record activities, problems and related repair activities S3 match customers' needs with existing products S4 verify that integrated systems capabilities and efficiency match specifications S5 secure/back-up data to ensure integrity during system integration				

Dimension 1 e-Comp. area	B. BUILD				
Dimension 2 e-Competence: Title + generic description	**B.3. Testing** Constructs and executes systematic test procedures for ICT systems or customer usability requirements to establish compliance with design specifications. Ensures that new or revised components or systems perform to expectation. Ensures meeting of internal, external, national and international standards; including health and safety, usability, performance, reliability or compatibility. Produces documents and reports to evidence certification requirements.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Performs simple tests in strict compliance with detailed instructions.	Organises test programmes and builds scripts to stress test potential vulnerabilities. Records and reports outcomes providing analysis of results.	Exploits specialist knowledge to supervise complex testing programmes. Ensures tests and results are documented to provide input to subsequent process owners such as designers, users or maintainers. Accountable for compliance with testing procedures including a documented audit trail.	Exploits wide ranging specialist knowledge to create a process for the entire testing activity, including the establishment of internal standard of practices. Provides expert guidance and advice to the testing team.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 techniques, infrastructure and tools to be used in the testing process K2 the lifecycle of a testing process K3 the different sorts of tests (functional, integration, performance, usability, stress etc.) K4 national and international standards defining quality criteria for testing K5 web, cloud and mobile technologies and environmental requirements				
Skills examples *Is able to*	S1 create and manage a test plan S2 manage and evaluate the test process S3 design tests of ICT systems S4 prepare and conduct tests of ICT systems S5 report and document tests and results				

Dimension 1 e-Comp. area	B. BUILD				
Dimension 2 e-Competence: Title + generic description	**B.4. Solution Deployment** Following predefined general standards of practice carries out planned necessary interventions to implement solution, including installing, upgrading or decommissioning. Configures hardware, software or network to ensure interoperability of system components and debugs any resultant faults or incompatibilities. Engages additional specialist resources if required, such as third party network providers. Formally hands over fully operational solution to user and completes documentation recording all relevant information, including equipment addressees, configuration and performance data.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Removes or installs components under guidance and in accordance with detailed instructions.	Acts systematically to build or deconstruct system elements. Identifies failing components and establishes root cause failures. Provides support to less experienced colleagues.	Accounts for own and others actions for solution provision and initiates comprehensive communication with stakeholders. Exploits specialist knowledge to influence solution construction providing advice and guidance.	–	–
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 performance analysis techniques K2 techniques related to problem management (operation, performance, compatibility) K3 software packaging and distribution methods and techniques K4 the impacts of deployment on the current architecture K5 the technologies and standards to be used during the deployment K6 web, cloud and mobile technologies and environmental requirements				
Skills examples *Is able to*	S1 organise deployment workflow and product roll-out activities S2 organise and plan beta-test activities, testing solution in its final operational environment S3 configure components at any level to guarantee correct overall interoperability S4 identify and engage expertise needed to solve interoperability problems S5 organise and control initial support service provision including user training during system start-up S6 organise population of data bases and manage data migration S7 collaborate to modify 3rd party code; support and maintain modified software				

Dimension 1 e-Comp. area	B. BUILD				
Dimension 2 e-Competence: Title + generic description	**B.5. Documentation Production** Produces documents describing products, services, components or applications to establish compliance with relevant documentation requirements. Selects appropriate style and media for presentation materials. Creates templates for document-management systems. Ensures that functions and features are documented in an appropriate way. Ensures that existing documents are valid and up to date.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Uses and applies standards to define document structure.	Determines documentation requirements taking into account the purpose and environment to which it applies.	Adapts the level of detail according to the objective of the documentation and the targeted population.	–	–
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 tools for production, editing and distribution of professional documents K2 tools for multimedia presentation creation K3 different technical documents required for designing, developing and deploying products, applications and services K4 version control of documentation production				
Skills examples *Is able to*	S1 observe and deploy effective use of corporate standards for publications S2 prepare templates for shared publications S3 organise and control content management workflow S4 keep publications aligned to the solution during the entire lifecycle				

Dimension 1 e-Comp. area	B. BUILD				
Dimension 2 e-Competence: Title + generic description	**B.6. Systems Engineering** Engineers software and/or hardware components to meet solution requirements such as specifications, costs, quality, time, energy efficiency, information security and data protection. Follows a systematic methodology to analyse and build the required components and interfaces. Builds system structure models and conducts system behavior simulation. Performs unit and system tests to ensure requirements are met.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Ensures interoperability of the system components. Exploits wide ranging specialist knowledge to create a complete system that will satisfy the system constraints and meet the customer's expectations.	Handles complexity by developing standard procedures and architectures in support of cohesive product development. Establishes a set of system requirements that will guide the design of the system. Identifies which system requirements should be allocated to which elements of the system.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 appropriate software programs/modules, DBMS and programming languages K2 hardware components, tools and hardware architectures K3 functional & technical designing K4 state of the art technologies K5 programming languages K6 power consumption models of software and/or hardware K7 information Security Basics K8 prototyping				
Skills examples *Is able to*	S1 explain and communicate the design/development to the customer S2 perform and evaluate test results against product specifications S3 apply appropriate software and/or hardware architectures S4 design and develop hardware architecture, user interfaces, business software components and embedded software components S5 manage and guarantee high levels of cohesion and quality in complex software developments S6 use data models S7 apply appropriate development and/or process models, to develop effectively and efficiently				

Dimension 1 e-Comp. area	C. RUN				
Dimension 2 e-Competence: Title + generic description	**C.1. User Support** Responds to user requests and issues, recording relevant information. Assures resolution or escalates incidents and optimises system performance in accordance with predefined service level agreements (SLAs). Understands how to monitor solution outcome and resultant customer satisfaction.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Interacts with users, applies basic product knowledge to respond to user requests. Solves incidents, following prescribed procedures.	Systematically interprets user problems and identifies solutions and possible side effects. Uses experience to address user problems and interrogates database for potential solutions. Escalates complex or unresolved incidents. Records and tracks issues from outset to conclusion.	Manages the support process and accountable for agreed SLA. Plans resource allocation to meet defined service level. Acts creatively, and applies continuous service improvement. Manages the support function budget.	–	–
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 relevant ICT user applications K2 database structures and content organisation K3 corporate escalation procedures K4 software distribution methods and procedures for fix application and file transmission methodologies applicable to software fixes K5 sources of information for potential solutions				
Skills examples *Is able to*	S1 effectively interrogate users to establish symptoms S2 analyse symptoms to identify broad area of user error or technical failure S3 deploy support tools to systematically trace source of error or technical failure S4 clearly communicate with end users and provide instructions on how to progress issues S5 record and code issues to support growth and integrity of online support tools				

Dimension 1 e-Comp. area	C. RUN				
Dimension 2 e-Competence: Title + generic description	**C.2. Change Support** Implements and guides the evolution of an ICT solution. Ensures efficient control and scheduling of software or hardware modifications to prevent multiple upgrades creating unpredictable outcomes. Minimises service disruption as a consequence of changes and adheres to defined service level agreement (SLA). Ensures consideration and compliance with information security procedures.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	During change, acts systematically to respond to day by day operational needs and react to them, avoiding service disruptions and maintaining coherence to (SLA) and information security requirements.	Ensures the integrity of the system by controlling the application of functional updates, software or hardware additions and maintenance activities. Complies with budget requirements.		–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 functional specifications of the information system K2 the existing ICT application technical architecture K3 how business processes are integrated and their dependency upon ICT applications K4 change management tools and technique K5 the best practices and standards in information security management				
Skills examples *Is able to*	S1 share functional and technical specifications with ICT teams in charge of the maintenance and evolution of ICT solutions S2 manage communications with ICT teams in charge of the maintenance and the evolution of information systems solutions S3 analyse the impact of functional/technical changes on users S4 anticipate all actions required to mitigate the impact of changes (training, documentation, new processes…).				

Dimension 1 e-Comp. area	C. RUN				
Dimension 2 e-Competence: Title + generic description	**C.3. Service Delivery** Ensures service delivery in accordance with established service level agreements (SLA's). Takes proactive action to ensure stable and secure applications and ICT infrastructure to avoid potential service disruptions, attending to capacity planning and to information security. Updates operational document library and logs all service incidents. Maintains monitoring and management tools (i.e. scripts, procedures). Maintains IS services. Takes proactive measures.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	Acts under guidance to record and track reliability data.	Systematically analyses performance data and communicates findings to senior experts. Escalates potential service level failures and security risks, recommends actions to improve service reliability. Tracks reliability data against SLA.	Programmes the schedule of operational tasks. Manages costs and budget according to the internal procedures and external constraints. Identifies the optimum number of people required to resource the operational management of the IS infrastructure.	–	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 how to interpret ICT service delivery requirements K2 best practices and standards in ICT service delivery. K3 how to monitor service delivery K4 how to record service delivery actions and able to identify failures K5 the best practices and standards in information security management K6 web, cloud and mobile technologies				
Skills examples *Is able to*	S1 apply the processes which comprise the organisation's ICT service delivery strategy S2 fill in and complete documentation used in ICT service delivery S3 analyse service delivery provision and report outcomes to senior colleagues S4 plan and apply manpower workload/requirements for efficient and cost effective service provision				

Dimension 1 e-Comp. area	C. RUN				
Dimension 2 e-Competence: Title + generic description	**C.4. Problem Management** Identifies and resolves the root cause of incidents. Takes a proactive approach to avoidance or identification of root cause of ICT problems. Deploys a knowledge system based on recurrence of common errors. Resolves or escalates incidents. Optimises system or component performance.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Identifies and classifies incident types and service interruptions. Records incidents cataloguing them by symptom and resolution.	Exploits specialist knowledge and in-depth understanding of the ICT infrastructure and problem management process to identify failures and resolve with minimum outage. Makes sound decisions in emotionally charged environments on appropriate action required to minimise business impact. Rapidly identifies failing component, selects alternatives such as repair, replace or reconfigure.	Provides leadership and is accountable for the entire problem management process. Schedules and ensures well trained human resources, tools, and diagnostic equipment are available to meet emergency incidents. Has depth of expertise to anticipate critical component failure and make provision for recovery with minimum downtime. Constructs escalation processes to ensure that appropriate resources can be applied to each incident.	–
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 the organisation's overall ICT infrastructure and key components K2 the organisation's reporting procedures K3 the organisation's critical situation escalation procedures K4 the application and availability of diagnostic tools K5 the link between system infrastructure elements and impact of failure on related business processes.				
Skills examples *Is able to*	S1 monitor progress of issues throughout lifecycle and communicate effectively S2 identify potential critical component failures and take action to mitigate effects of failure S3 conduct risk management audits and act to minimise exposures S4 allocate appropriate resources to maintenance activities, balancing cost and risk S5 communicate at all levels to ensure appropriate resources are deployed internally or externally to minimise outages				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.1. Information Security Strategy Development** Defines and makes applicable a formal organisational strategy, scope and culture to maintain safety and security of information from external and internal threats, i.e. digital forensic for corporate investigations or intrusion investigation. Provides the foundation for Information Security Management, including role identification and accountability. Uses defined standards to create objectives for information integrity, availability, and data privacy.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	–	Exploits depth of expertise and leverages external standards and best practices.	Provides strategic leadership to embed information security into the culture of the organisation.
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 the potential and opportunities of relevant standards and best practices K2 the impact of legal requirements on information security K3 the information strategy of the organisation K4 possible security threats K5 the mobility strategy K6 the different service models (SaaS, PaaS, IaaS) and operational translations (i.e. Cloud Computing)				
Skills examples *Is able to*	S1 develop and critically analyse the company strategy for information security S2 define, present and promote an information security policy for approval by the senior management of the organisation S3 apply relevant standards, best practices and legal requirements for information security S4 anticipate required changes to the organisation's information security strategy and formulate new plans S5 propose effective contingency measures				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.2. ICT Quality Strategy Development** Defines, improves and refines a formal strategy to satisfy customer expectations and improve business performance (balance between cost and risks). Identifies critical processes influencing service delivery and product performance for definition in the ICT quality management system. Uses defined standards to formulate objectives for service management, product and process quality. Identifies ICT quality management accountability.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	–	Exploits wide ranging specialist knowledge to leverage and authorise the application of external standards and best practices.	Provides strategic leadership to embed ICT quality (i.e. metrics and continuous improvement) into the culture of the organisation.
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 the major information technology industry frameworks, e.g. COBIT, ITIL, CMMI, ISO – and their implications for corporate IS governance K2 the information strategy of the organisation K3 the different service models (SaaS, PaaS, IaaS) and operational translations (i.e. Cloud Computing)				
Skills examples *Is able to*	S1 define an ICT quality policy to meet the organisation's standards of performance and customer satisfaction objectives S2 identify quality metrics to be used S3 apply relevant standards and best practices to maintain information quality				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.3. Education and Training Provision** Defines and implements ICT training policy to address organisational skill needs and gaps. Structures, organises and schedules training programmes and evaluates training quality through a feedback process and implements continuous improvement. Adapts training plans to address changing demand.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Organises the identification of training needs; collates organisation requirements, identifies, selects and prepares schedule of training interventions.	Acts creatively to analyse skills gaps; elaborates specific requirements and identifies potential sources for training provision. Has specialist knowledge of the training market and establishes a feedback mechanism to assess the added value of alternative training programmes.	–	–
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 appropriate pedagogical approaches and education delivery methods e.g. classroom, online, text, dvd K2 the competitive market for educational offering K3 training needs analysis methodologies K4 empowerment techniques				
Skills examples *Is able to*	S1 organise training and education schedules to meet market needs S2 identify and maximise use of resources required to deliver a cost effective schedule S3 promote and market education and training provision S4 analyse feedback data and use it to drive continuous improvement of education and training delivery S5 design curricula and training programmes to meet customer ICT education needs S6 address CPD needs of staff to meet organisational requirements				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.4. Purchasing** Applies a consistent procurement procedure, including deployment of the following sub processes: specification requirements, supplier identification, proposal analysis, evaluation of the energy efficiency and environmental compliance of products, suppliers and their processes, contract negotiation, supplier selection and contract placement. Ensures that the entire purchasing process is fit for purpose, adds business value to the organisation compliant to legal and regulatory requirements.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1** –	**Level 2** Understands and applies the principles of the procurement process; places orders based on existing supplier contracts. Ensures the correct execution of orders, including validation of deliverables and correlation with subsequent payments.	**Level 3** Exploits specialist knowledge to deploy the purchasing process, ensuring positive commercial relationships with suppliers. Selects suppliers, products and services by evaluating performance, cost, timeliness and quality. Decides contract placement and complies with organisational policies.	**Level 4** Provides leadership for the application of the organisation's procurement policies and makes recommendations for process enhancement. Applies experience and procurement practice expertise to make ultimate purchasing decisions.	**Level 5** –
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 typical purchase contract terms and conditions K2 own organisation purchasing policies K3 financial models e.g. discount structures K4 the current market for relevant products or services K5 the issues and implications of outsourcing services K6 different service models (SaaS, PaaS, IaaS) and operational translations (e.g. Cloud Computing)				
Skills examples *Is able to*	S1 interpret product/service specifications S2 negotiate terms, conditions and pricing S3 analyse received proposals/offers S4 manage the purchasing budget S5 lead purchase process improvement S6. analyse the energy efficiency and environmental-related aspects of a proposal S7 verify that purchasing processes respect legal issues including IPR				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.5. Sales Proposal Development** Develops technical proposals to meet customer solution requirements and provide sales personnel with a competitive bid. Underlines the energy efficiency and environmental impact related to a proposal. Collaborates with colleagues to align the service or product solution with the organisation's capacity to deliver.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Organises collaboration between relevant internal departments, for example, technical, sales and legal. Facilitates comparison between customer requirement and available 'off the shelf' solutions.	Acts creatively to develop proposal incorporating a complex solution. Customises solution in a complex technical and legal environment and ensures feasibility, legal and technical validity of customer offer.	–	–
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 customer needs K2 internally adopted sales and marketing techniques K3 legal requirements K4 internal business practices K5 product or service unique selling points K6 the different service models (SaaS, PaaS, IaaS) and operational translations (e.g. Cloud Computing)				
Skills examples *Is able to*	S1 construct the framework for proposal documentation S2 co-ordinate and facilitate multidisciplinary teams contributing to the proposal S3 interpret the terms and conditions of the tender documentation S4 evaluate the strengths and weaknesses of potential competitors S5 ensure that a proposal is of high quality and is submitted on time S6 communicates the energy efficiency and environmental-related aspects of a proposal S7 ensure that proposals meet compliance requirements				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.6. Channel Management** Develops the strategy for managing third party sales outlets. Ensures optimum commercial performance of the value-added resellers (VARs) channel through the provision of a coherent business and marketing strategy. Defines the targets for volume, geographic coverage and the industry sector for VAR engagements and structures incentive programmes to achieve complimentary sales results.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Acts creatively to influence the establishment of a VAR network. Manages the identification and assessment of potential VAR members and sets up support procedures. VARs managed to maximise business performance.	Exploits wide ranging skills in marketing and sales to create the organisation's VAR strategy. Establishes the processes by which VARs will be managed to maximise business performance.	–
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 the competition (what and where) K2 the market distribution across the field K3 sales channel typologies (e.g. direct sales, VAR, web marketing) K4 incentive policies K5 user experience of each channel type K6 legal issues relating to channels and VAR organisations				
Skills examples *Is able to*	S1 choose the best sales channel according to the product or solution being delivered S2 define discounts according to the competitive environment S3 select value added retailers based on thorough analyses, plan and make contacts S4 monitor and supervise channel performances in line with sales forecast and able to define corrective actions if necessary S5 apply digital marketing methods				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.7. Sales Management** Drives the achievement of sales results through the establishment of a sales strategy. Demonstrates the added value of the organisation's products and services to new or existing customers and prospects. Establishes a sales support procedure providing efficient response to sales enquiries, consistent with company strategy and policy. Establishes a systematic approach to the entire sales process, including understanding customer needs, forecasting, prospect evaluation, negotiation tactics and sales closure.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1** –	**Level 2** –	**Level 3** Contributes to the sales process by effectively presenting products or services to customers.	**Level 4** Assesses and estimates appropriate sales strategies to deliver company results. Decides and allocates annual sales targets and adjusts incentives to meet market conditions.	**Level 5** Assumes ultimate responsibility for the sales performance of the organisation. Authorises resource allocation, prioritises product and service promotions, advises board directors of sales performance.
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 customer organisation (needs, budget allocation and decision makers) K2 company specific processes (sales, ITIL, etc.) K3 market trends and own service offering portfolio K4 legal, financial and contractual rules K5 project management procedures K6 current market imperatives e.g. risks, changes, innovation				
Skills examples *Is able to*	S1 develop strong co-operation between customers and own organisation S2 keep abreast of market news e.g. risks, changes, innovations and communicate to internal business units, to improve service and product portfolio S3 react proactively to customer business changes and communicate them internally S4 generate sustainable customer relationships S5 analyse sales performance to build forecasts and develop a tactical sales plan				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.8. Contract Management** Provides and negotiates contract in accordance with organisational processes. Ensures that contract and deliverables are provided on time, meet quality standards, and conform to compliance requirements. Addresses non-compliance, escalates significant issues, drives recovery plans and if necessary amends contracts. Maintains budget integrity. Assesses and addresses supplier compliance to legal, health and safety and security standards. Actively pursues regular supplier communication.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Acts systematically to monitor contract compliance and promptly escalate defaults.	Evaluates contract performance by monitoring performance indicators. Assures performance of the complete supply chain. Influences the terms of contract renewal.	Provides leadership for contract compliance and is the final escalation point for issue resolution.	–
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 applicable SLA K2 company policy for contract management K3 legal regulations applicable to ICT contracts K4 legal issues including IPR K5 different service models (SaaS, PaaS, IaaS), service levels and contractual translations (e.g. Cloud Computing)				
Skills examples *Is able to*	S1 foster positive relationships with stakeholders S2 negotiate contract terms and conditions S3 apply judgment and flexibility in contract negotiations compliant with internal rules and policies				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.9. Personnel Development** Diagnoses individual and group competence, identifying skill needs and skill gaps. Reviews training and development options and selects appropriate methodology taking into account the individual, project and business requirements. Coaches and/or mentors individuals and teams to address learning needs.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Briefs/trains individuals and groups, holds courses of instruction.	Monitors and addressees the development needs of individuals and teams.	Takes proactive action and develops organisational processes to address the development needs of individuals, teams and the entire workforce.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 competence development methods K2 competence and skill needs analysis methodologies K3 learning and development support methods (e.g. coaching, teaching) K4 technology and processes K5 empowerment techniques				
Skills examples *Is able to*	S1 identify competence and skill gaps S2 identify and recommend work based development opportunities S3 incorporate within routine work processes, opportunities for skills development S4 coach S5 address professional development needs of staff to meet organisational requirements				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.10. Information and Knowledge Management** Identifies and manages structured and unstructured information and considers information distribution policies. Creates information structure to enable exploitation and optimisation of information. Understands appropriate tools to be deployed to create, extract, maintain, renew and propagate business knowledge in order to capitalise from the information asset.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Analyses business processes and associated information requirements and provides the most appropriate information structure.	Integrates the appropriate information structure into the corporate environment.	Correlates information and knowledge to create value for the business. Applies innovative solutions based on information retrieved.
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 methods to analyse information and business processes K2 ICT devices and tools applicable for the storage and retrieval of data K3 challenges related to the size of data sets (e.g. big data) K4 challenges related to unstructured data (e.g. data analytics)				
Skills examples *Is able to*	S1 gather internal and external knowledge and information needs S2 formalise customer requirements S3 translate/reflect business behaviour into structured information S4 make information available S5 ensure that IPR and privacy issues are respected S6 capture, storage, analyse, data sets, that are complex and large, not structured and in different formats S7 apply data mining methods				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.11. Needs Identification** Actively listens to internal/external customers, articulates and clarifies their needs. Manages the relationship with all stakeholders to ensure that the solution is in line with business requirements. Proposes different solutions (e.g. make-or-buy), by performing contextual analysis in support of user centered system design. Advises the customer on appropriate solution choices. Acts as an advocate engaging in the implementation or configuration process of the chosen solution.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Establishes reliable relationships with customers and helps them clarify their needs.	Exploits wide ranging specialist knowledge of the customers business to offer possible solutions to business needs. Provides expert guidance to the customer by proposing solutions and supplier.	Provides leadership in support of the customers' strategic decisions. Helps customer to envisage new ICT solutions, fosters partnerships and creates value propositions.
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 emerging technologies and the relevant market applications K2 business needs K3 organisation processes and structures K4 customer need analysis techniques K5 communication techniques K6 "Story telling" techniques				
Skills examples *Is able to*	S1 analyse and formalise business processes S2 analyse customer requirements S3 present ICT solution cost/benefit				

Dimension 1 e-Comp. area	D. ENABLE				
Dimension 2 e-Competence: Title + generic description	**D.12. Digital Marketing** Understands the fundamental principles of digital marketing. Distinguishes between the traditional and digital approaches. Appreciates the range of channels available. Assesses the effectiveness of the various approaches and applies rigorous measurement techniques. Plans a coherent strategy using the most effective means available. Understands the data protection and privacy issues involved in the implementation of the marketing strategy.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Understands and applies digital marketing tactics to develop an integrated and effective digital marketing plan using different digital marketing areas such as search, display, e-mail, social media and mobile marketing.	Exploits specialist knowledge to utilise analytical tools and assess the effectiveness of websites in terms of technical performance and download speed. Evaluates the user engagement by the application of a wide range of analytical reports. Knows the legal implications of the approaches adopted.	Develops clear meaningful objectives for the Digital Marketing Plan. Selects appropriate tools and sets budget targets for the channels adopted. Monitors, analyses and enhances the digital marketing activities in an ongoing manner.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 marketing strategy K2 web technologies K3 search engine marketing (PPC) K4 search engine optimization (SEO) K5 mobile marketing (e.g. Pay Per Click) K6 social media marketing K7 e-mail marketing K8 display marketing K9 legal issues/requirements				
Skills examples *Is able to*	S1 understand how web technology can be used for marketing purposes S2 understand User Centric Marketing S3 use and interpret web analytics S4 understand the on-line environment				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.1. Forecast Development** Interprets market needs and evaluates market acceptance of products or services. Assesses the organisation's potential to meet future production and quality requirements. Applies relevant metrics to enable accurate decision making in support of production, marketing, sales and distribution functions.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Exploits skills to provide short-term forecast using market inputs and assessing the organisation's production and selling capabilities.	Acts with wide ranging accountability for the production of a long-term forecast. Understands the global marketplace, identifying and evaluating relevant inputs from the broader business, political and social context.	–
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 market size and relevant fluctuations K2 accessibility of the market according to current conditions (e.g. government policies, emerging technologies, social and cultural trends, etc.) K3 the extended supply chain operation K4 large scale data analysis techniques (data mining)				
Skills examples *Is able to*	S1 apply what-if techniques to produce realistic outlooks S2 generate sales forecasts in relation to current market share S3 generate production forecasts taking into account manufacturing capacity S4 compare sales and production forecasts and analyse potential mismatches S5 interpret external research data and analyse information				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.2. Project and Portfolio Management** Implements plans for a programme of change. Plans and directs a single or portfolio of ICT projects to ensure co-ordination and management of interdependencies. Orchestrates projects to develop or implement new, internal or externally defined processes to meet identified business needs. Defines activities, responsibilities, critical milestones, resources, skills needs, interfaces and budget, optimises costs and time utilisation, minimises waste and strives for high quality. Develops contingency plans to address potential implementation issues. Delivers project on time, on budget and in accordance with original requirements. Creates and maintains documents to facilitate monitoring of project progress.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Understands and applies the principles of project management and applies methodologies, tools and processes to manage simple projects, Optimises costs and minimises waste.	Accounts for own and others activities, working within the project boundary, making choices and giving instructions, optimising activities and resources. Manages and supervises relationships within the team; plans and establishes team objectives and outputs and documents results.	Manages complex projects or programmes, including interaction with others. Influences project strategy by proposing new or alternative solutions and balancing effectiveness and efficiency. Is empowered to revise rules and choose standards. Takes overall responsibility for project outcomes, including finance and resource management and works beyond project boundary.	Provides strategic leadership for extensive interrelated programmes of work to ensure that Information Technology is a change enabling agent and delivers benefit in line with overall business strategic aims. Applies extensive business and technological mastery to conceive and bring innovative ideas to fruition.
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 a project methodology, including approaches to define project steps and tools to set up action plans K2 technologies to be implemented within the project K3 company business strategy and business processes K4 development and compliance to financial plans and budgets K5 IPR principles and regulation K6 structured project management methodologies (e.g. agile techniques)				
Skills examples *Is able to*	S1 identify project risks and define action plans to mitigate S2 define a project plan by breaking it down into individual project tasks S3 communicate project progress to all relevant parties reporting on topics such as cost control, schedule achievements, quality control, risk avoidance and changes to project specifications S4 delegate tasks and manage team member contributions appropriately S5 manage external ,contracted resources to achieve project objectives S6 optimise project portfolio timelines and delivery objectives by achieving consensus on stakeholder priorities				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.3. Risk Management** Implements the management of risk across information systems through the application of the enterprise defined risk management policy and procedure. Assesses risk to the organisation's business, including web, cloud and mobile resources. Documents potential risk and containment plans.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Understands and applies the principles of risk management and investigates ICT solutions to mitigate identified risks.	Decides on appropriate actions required to adapt security and address risk exposure. Evaluates, manages and ensures validation of exceptions; audits ICT processes and environment.	Provides leadership to define and make applicable a policy for risk management by considering all the possible constraints, including technical, economic and political issues. Delegates assignments.	–
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 corporate values and interests to apply risk analysis taking into account corporate values and interests K2 the return on investment compared to risk avoidance K3 good practices (methodologies) and standards in risk analysis				
Skills examples *Is able to*	S1 develop risk management plan to identify required preventative actions S2 communicate and promote the organisation's risk analysis outcomes and risk management processes S3 design and document the processes for risk analysis and management S4 apply mitigation and contingency actions				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.4. Relationship Management** Establishes and maintains positive business relationships between stakeholders (internal or external) deploying and complying with organisational processes. Maintains regular communication with customer/partner/supplier, and addresses needs through empathy with their environment and managing supply chain communications. Ensures that stakeholder needs, concerns or complaints are understood and addressed in accordance with organisational policy.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Accounts for own and others actions in managing a limited number of stakeholders.	Provides leadership for large or many stakeholder relationships. Authorises investment in new and existing relationships. Leads the design of a workable procedure for maintaining positive business relationships.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 organisation processes including, decision making, budgets and management structure K2 business objectives, own and of other stakeholders K3 how to measure and apply resources to meet stakeholder requirements K4 business challenges and risks				
Skills examples *Is able to*	S1 deploy empathy to customer needs S2 identify potential win win opportunities for customer and own organisation S3 establish realistic expectations to support development of mutual trust S4 monitor ongoing commitments to ensure fulfilment S5 communicate good and bad news to avoid surprises				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.5. Process Improvement** Measures effectiveness of existing ICT processes. Researches and benchmarks ICT process design from a variety of sources. Follows a systematic methodology to evaluate, design and implement process or technology changes for measurable business benefit. Assesses potential adverse consequences of process change.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Exploits specialist knowledge to research existing ICT processes and solutions in order to define possible innovations. Makes recommendations based on reasoned arguments.	Provides leadership and authorises implementation of innovations and improvements that will enhance competitiveness or efficiency. Demonstrates to senior management the business advantage of potential changes.	–
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 research methods, benchmarks and measurements methods K2 evaluation, design and implementation methodologies K3 existing internal processes K4 relevant developments in ICT (e.g. virtualisation, open data, etc.), and the potential impact on processes K5 web, cloud and mobile.technologies K6 resource optimisation and waste reduction				
Skills examples *Is able to*	S1 compose, document and catalogue essential processes and procedures S2 propose process changes to facilitate and rationalise improvements S3 implement process changes				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.6. ICT Quality Management** Implements ICT quality policy to maintain and enhance service and product provision. Plans and defines indicators to manage quality with respect to ICT strategy. Reviews quality measures and recommends enhancements to influence continuous quality improvement.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Communicates and monitors application of the organisation's quality policy.	Evaluates quality management indicators and processes based on ICT quality policy and proposes remedial action.	Assesses and estimates the degree to which quality requirements have been met and provides leadership for quality policy implementation. Provides cross functional leadership for setting and exceeding quality standards.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 which methods, tools and procedure are applied within the organisation and where they should be applied K2 the IS internal quality audit approach K3 regulations and standards in energy efficiency and e-waste				
Skills examples *Is able to*	S1 illustrate how methods, tools and procedures can be applied to implement the organisation's quality policy S2 evaluate and analyse process steps to identify strengths and weaknesses S3 assist process owners in the choice and use of measures to evaluate effectiveness and efficiency of the overall process S4 monitor, understand and act upon quality indicators S5 perform quality audits				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.7. Business Change Management** Assesses the implications of new digital solutions. Defines the requirements and quantifies the business benefits. Manages the deployment of change taking into account structural and cultural issues. Maintains business and process continuity throughout change, monitoring the impact, taking any required remedial action and refining approach.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	Evaluates change requirements and exploits specialist skills to identify possible methods and standards that can be deployed.	Provides leadership to plan, manage and implement significant ICT led business change.	Applies pervasive influence to embed organisational change.
Dimension 4 Knowledge examples *Knows/aware of/familiar with*	K1 digital strategies K2 the impact of business changes on the organisation and human resources K3 the impact of business changes on legal issues				
Skills examples *Is able to*	S1 analyse costs and benefits of business changes S2 select appropriate ICT solutions based upon benefit, risks and overall impact S3 construct and document a plan for implementation of process enhancements S4 apply project management standards and tools				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.8. Information Security Management** Implements information security policy. Monitors and takes action against intrusion, fraud and security breaches or leaks. Ensures that security risks are analysed and managed with respect to enterprise data and information. Reviews security incidents, makes recommendations for security policy and strategy to ensure continuous improvement of security provision.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	Systematically scans the environment to identify and define vulnerabilities and threats. Records and escalates non-compliance.	Evaluates security management measures and indicators and decides if compliant to information security policy. Investigates and instigates remedial measures to address any security breaches.	Provides leadership for the integrity, confidentiality and availability of data stored on information systems and complies with all legal requirements.	–
Dimension 4 Knowledge examples *Knows/aware of/ familiar with*	K1 the organisation's security management policy and its implications for engagement with customers, suppliers and subcontractors K2 the best practices and standards in information security management K3 the critical risks for information security management K4 the ICT internal audit approach K5 security detection techniques, including mobile and digital K6 cyber attack techniques and counter measures for avoidance K7 computer forensics				
Skills examples *Is able to*	S1 document the information security management policy, linking it to business strategy S2 analyse the company critical assets and identify weaknesses and vulnerability to intrusion or attack S3 establish a risk management plan to feed and produce preventative action plans S4 perform security audits S5 apply monitoring and testing techniques S6 establish the recovery plan S7 implement the recovery plan in case of crisis				

Dimension 1 e-Comp. area	E. MANAGE				
Dimension 2 e-Competence: Title + generic description	**E.9. IS Governance** Defines, deploys and controls the management of information systems in line with business imperatives. Takes into account all internal and external parameters such as legislation and industry standard compliance to influence risk management and resource deployment to achieve balanced business benefit.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
	–	–	–	Provides leadership for IS governance strategy by communicating, propagating and controlling relevant processes across the entire ICT infrastructure.	Defines and aligns the IS governance strategy incorporating it into the organisation's corporate governance strategy. Adapts the IS governance strategy to take into account new significant events arising from legal, economic, political, business, technological or environmental issues.
Dimension 4 Knowledge examples *Knows / aware of / familiar with*	K1 the ICT infrastructure and the business organisation K2 the business strategy of the company K3 the business values K4 the legal requirements				
Skills examples *Is able to*	S1 manage applicable governance models S2 analyse the business context of the company and its evolution S3 define and implement appropriate KPI's S4 communicate the value, risks and opportunities derived from the IS strategy				

Annex 2: 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**	**Principal** 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**	**Lead Professional / Senior Manager** 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**	**Senior Professional / Manager** 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**	**Professional** 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.	Designing, managing, surveying, monitoring, evaluating, improving, finding non standard solutions.
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-manageme nt 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**	**Associate** Able to apply knowledge and skills to solve straight forward problems; responsible for own actions; operating in a stable environment.	Support/ Service		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**

The European e-Competence Framework is a component of the European Union's strategy on «e-Skills for the 21st 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**
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** and **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

Foto sources

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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 organisations 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 21st 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