SLOVENSKI STANDARD
SIST EN 16234-1:2016

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Krovni seznam e-usposobljenosti (e-CF) - Skupno evropsko okolje za poklicne strokovnjake v vseh industrijskih sektorjih - 1. del: Krovni seznam

E-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all industry sectors - Part 1: Framework

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ICS:

03.100.30	Vodenje ljudi	Management of human resources
35.240.01	Uporabniške rešitve informacijske tehnike in tehnologije na splošno	Application of information technology in general

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EUROPEAN STANDARD

NORME EUROPÉENNE

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English Version

e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all industry sectors - Part 1: Framework

Référentiel des e-compétences - Référentiel européen commun pour les professionnels des technologies de l'information et de la communication dans tous les secteurs d'activité - Partie 1 : Référentiel

e-Kompetenz-Rahmen (e-CF) - Ein gemeinsamer europäischer Rahmen für IKT-Fach- und Führungskräfte in allen Branchen - Teil 1: Rahmenwerk

This European Standard was approved by CEN on 14 January 2016.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN 16234-1:2016 (E)

Contents

Page

iTeh STANDARD PREVIEW
(standards.iteh.ai)

2

iTeh STANDARD PREVIEW

(standards.iteh.ai)

EN 16234-1:2016 (E)

European foreword

This document (EN 16234-1:2016) has been prepared by Technical Committee CEN/TC 428 "Project Committee - e-competences and ICT Professionalism", the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2016, and conflicting national standards shall be withdrawn at the latest by October 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes CWA 16234-1:2014.

This European Standard is made up of three parts defining an EN which is the transposition of CWA 16234-1, CWA 16234-2, CWA 16234-3 and CWA 16234-4:

– Part 1: *e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all industry sectors –Part 1: Framework* (EN);

– Part 2: *e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all industry sectors – Part 2: User guide* (TR);

– Part 3: *e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all industry sectors – Part 3: Methodology* (TR).

Part 1 is fully standalone, and Parts 2 and 3 rely on Part 1.

A relationship with the European ICT Professional Profiles (CWA 16458, original CWA updated by e-CF 3.0 competences and re-published in 2014) is established: to each Profile a number of relevant e-Competences and their applying level(s), as defined by this standard, are assigned.

This standard on qualification of personnel outlines the minimum requirements (i.e. a threshold) of the staff competence based on skills and/or knowledge. This principle needs to be taken into consideration when assessing what part is mandatory and what becomes a simple recommendation when setting out the elements of each competence (shall versus should/may/can, etc.)

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This standard was established as a tool to support mutual understanding and provide transparency of language through the articulation of competences required and deployed by Information and Communication Technology (ICT) professionals.

To support users and guide developers of applications to this standard, the following narrative provides an overview of the underpinning philosophy and principles adopted during the standard's construction and vital for successive updates.

The Guiding Principles:

This standard is an enabler; it is designed to be a tool to empower users, not to restrict them.

This standard provides a structure and content for application by many types of users from organizations in the private and public sector, ICT user or ICT supply organizations, educational institutions including higher education and private certification providers, social partners and individuals. In this broad application context, this standard is designed to support common understanding, not to mandate the use of each and every word used within it.

This standard 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. Attitudes are the glue which keep knowledge and skills together. Soft skills are the attitudes' components that can be made explicit, trained and developed.

Competence is a durable concept and although technology, jobs, marketing terminology and promotional concepts within the ICT environment change rapidly, this standard 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 this standard, they may be integrated as knowledge and skills examples in Dimension 4.

This standard does not attempt to cover every possible competence deployed by an ICT professional nor are the included competences necessarily unique to ICT. This standard 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, this standard 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 this standard is therefore, not a scientific choice, but a pragmatic process engaging a broad cross-section of stakeholders who prioritize competence inclusion based upon industry knowledge and experience.

This standard is structured across four dimensions. e-Competences in Dimensions 1 and 2 are presented from the organizational 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 organizational and individual competences. Dimension 4 provides samples of knowledge and skills to the e-Competences in Dimension 2, they are not intended to be exhaustive but for inspiration and orientation only.

EN 16234-1:2016 (E)

This standard has a sector specific relationship to the EQF; competence levels within this standard provide a consistent and rational relationship to levels defined within the EQF. The relativity between EQF learning levels and the e-competence proficiency levels of this standard has been systematically developed to enable consistent interpretation of the EQF in the ICT workplace environment.

Continuity of this standard is imperative; following maintenance updates it is essential that users are provided with a simple upgrade path. Users of this standard invest considerable time and resources to align processes or procedures with it. Organizations deploying these downstream activities are reliant upon this standard and need to be confident of the continued sustainability of their processes. Updates of this standard need to recognize this requirement and provide for continuity enabling use of the existing version of this standard until it is convenient to upgrade to the latest version.

This standard is neutral; 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. This standard is a key component of the European Commission's Digital Agenda; it is designed for use by any organization and individual engaged in ICT Human Resources planning and competence development.

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1 Scope

This European Standard provides a reference of 40 competences as required and applied at the Information and Communication Technology (ICT) business related workplace, using a common language for competences, skills and proficiency levels that can be understood across Europe. As the first sector-specific implementation of the European Qualifications Framework (EQF), this European Standard aligns its proficiency levels to the EQF learning levels.

This European Standard was created for application by:

- ICT service, user and supply organizations,

- ICT professionals, managers and human resource (HR) departments,

- vocational education institutions and training bodies including higher education,

- social partners (trade unions and employer association), professional associations, accreditation, validation and assessment bodies,

- market analysts and policy makers,

and other organizations and stakeholders in public and private sectors.

2 Normative reference

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No document has been identified as indispensable for the application of this document.
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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
ICT professional skill
capability relating or belonging to professions in the ICT sector

[SOURCE: OXFORD English Dictionary, modified – the word "ICT" has been added]

3.2
ICT management skill
capability of dealing with and controlling issues related or belonging to the ICT

[SOURCE: OXFORD English Dictionary, modified – the word "ICT" has been added]

3.3
ICT user skill
capability required for the effective application of ICT systems and devices by the individual ICT user

Note 1 to entry: ICT users apply systems as tools in support of their own work.

3.4
competence
demonstrated ability to apply knowledge, skills and attitudes for achieving observable results

EN 16234-1:2016 (E)

3.5
knowledge
body of facts, principles, theories and practices that is related to a field of work or study

[SOURCE: EQF]

3.6
skill
ability to apply knowledge and use know-how to complete tasks and solve problems, from managerial to technical

Note 1 to entry: In the context of this standard, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).

[SOURCE: EQF]

3.7
attitude
way that one thinks and feels about somebody or something; the way that one behaves towards somebody or something that shows how one thinks and feels

[SOURCE: OXFORD English Dictionary]

Note 1 to entry: Soft skills may shape attitudes; attitudes and soft skills can influence each other. For example, positive thinking leads to a positive attitude; good communication and conflict mediator skills may benefit a leadership attitude; a listener attitude facilitates relationship skills, etc.

3.8
soft skills
personal attributes that enable someone to interact effectively and harmoniously with other people

[SOURCE: OXFORD English Dictionary]

Note 1 to entry: Soft skills include skills such as communication, ability to work on multidisciplinary teams, etc. These skills should be distinguished from technical, or "hard skills".

3.9
proficiency level
rank in a scale defined by three facets: context complexity, autonomy and behavior

Note 1 to entry: All three facets are also present and easily identifiable within the EQF definitions and descriptions. This maintains a consistent relationship between the EQF (expressing learning levels) and this standard (expressing proficiency levels).

3.10
autonomy
capacity to act without external control or influence

Note 1 to entry: Ranges between "responding to instructions" and "making personal choices".

3.11
context complexity
richness of the circumstances forming a context (any circumstances or situations that form the setting for an event), their variety, and their level of stability, so that the higher the context stability, the less its complexity

Note 1 to entry: Ranges between "structured – predictable" situations and "unpredictable – unstructured" situations.

3.12
behavior
observable outcome of attitudes

Note 1 to entry: Ranges between "the ability to apply" and "the ability to conceive".

3.13
plan
e-Competence area related to the capabilities of conceiving, deciding, designing and setting up products, services, actions and policies

[SOURCE: CMMI 2006]

3.14
build
e-Competence area concerned with the capabilities of development and implementation of products, services and solutions

[SOURCE: CMMI 2006]

3.15
run
e-Competence area focused on the capabilities of provisioning, supporting and maintaining the products, services and solutions delivered or deployed

[SOURCE: CMMI 2006]

3.16
enable
e-Competence area representing capabilities that produce the proper conditions and the facilities for implementing and managing ICT systems, e.g. security, quality management, marketing and selling, distributing and supplying, procuring, acquiring incl. outsourcing, disposition

[SOURCE: CMMI 2006]

3.17
manage
e-Competence area representing companies' daily business administration and improvement

[SOURCE: CMMI 2006]

EN 16234-1:2016 (E)

4   Symbols and abbreviated terms

The following symbols and abbreviated terms are used in Clause 7.

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 Server

IaaS - Infrastructure as a Service

ICT - Information and Communication 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)

ISO - International Standardization Organization

ITIL - Information Technology Infrastructure Library

KPI - Key Performance Indicator

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

5   General principles

5.1 General

This standard is structured across four dimensions. These dimensions reflect different levels of business and human resource planning requirements in addition to job and work proficiency guidelines and are specified as follows.

5.2 Dimension 1: Five e-Competence areas

Five e-Competence areas were derived from the ICT main business processes PLAN – BUILD – RUN – ENABLE – MANAGE in order to identify sets of e-Competences expressing the abilities of planning (conceiving, designing, deciding, etc.), building (developing and implementing), running (delivering, supporting, maintaining, etc.), enabling (creating the proper conditions), and managing. They are named identically:

A. PLAN

B. BUILD

C. RUN

D. ENABLE

E. MANAGE

Assigning an e-Competence to a specific process, like PLAN or MANAGE, is not an exact science. It plays a less important role in the completed and applied standard than during its development. The main function of Dimension 1 in this standard is to serve as a navigation and entry point to the e-Competences in Dimensions 2, 3 and 4.

5.3 Dimension 2: 40 e-Competences

This dimension encompasses a set of reference e-Competences for each e-Competence area. Each e-Competence is specified by a title and a generic description of the competence. A total of 40 e-Competences have been identified; they provide the generic reference definitions of this standard.

The e-Competences defined within this standard are not exhaustive; nonetheless they provide a basic, clear and sound orientation for organizations which need to take decisions about recruitment, career paths, training, assessment, etc.; and also for people to understand organizations' competence needs. Furthermore, descriptions in Dimension 2 provide general and comprehensive explanations of the reference e-Competences.

5.4 Dimension 3: Five proficiency levels with EQF relationship

In Dimension 3, specific proficiency levels are assigned to each e-Competence generally described in Dimension 2. The level specifications of this standard encompass the e-Competence levels e-1 to e-5. These levels have a sector specific, consistent and rational relationship to the EQF levels 3 – 8 (see Table 1).

Table 1 — e-Competence levels e-1 to e-5 related to EQF level 3–8

e-Competence level	related to EQF level
e-5	8
e-4	7
e-3	6
e-2	4 and 5
e-1	3

The relationship between EQF learning levels and the e-Competence proficiency levels of this standard has been systematically developed to enable consistent interpretation of the EQF in the ICT workplace (see B.1).

Precisely, the EQF expresses a progression from

a) absence of autonomy and responsibility, EQF level 1, to full accountability and substantial authority in one or more fields, EQF level 8 (third EQF column - Autonomy and Responsibility),

b) basic knowledge, EQF level 1, to "knowledge at the most advanced frontier of a field of work or study and at the interface between fields", EQF level 8 (first EQF column - Knowledge),

c) "basic skills required to carry out simple tasks", EQF level 1, to "the most advanced and specialized skills and techniques, including synthesis and evaluation, required to solve critical problems", EQF level 8 (Second EQF column – Skills).

EN 16234-1:2016 (E)

Likewise, the descriptions of e-Competence proficiency levels assigned to any e-Competence, in terms of abilities, context complexity, autonomy and accountability, are comparable to the EQF. However, e-Competence level specifications cover only relevant proficiency levels for each e-Competence descriptor in Dimension 2. No competence is allocated at all five levels. Moreover, e-Competence proficiency levels do not link directly to any degrees; they focus specifically on "demonstrated abilities" in practical work experiences.

5.5 Dimension 4: Knowledge and skills

Samples of knowledge and skills relate to the e-Competences in Dimension 2. They are provided to add value and context and are not intended to be exhaustive but for inspiration and orientation only.

5.6 Embedded in Dimension 2, 3 and 4: Attitudes

While competence definitions are explicitly assigned to Dimensions 2 and 3 and knowledge and skills samples appear in Dimension 4 of the framework, attitude is embedded in all three dimensions. Attitudes are the glue that bind skills, knowledge and experience together to form competence. They provide the motivation for effective and competent performance.

5.7 Overview

An overview of the e-Competence Framework is given in Table 2.

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