SLOVENSKI STANDARD
kSIST-TP FprCEN/TR 16234-2:2020

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Krovni seznam e-usposobljenosti (e-CF) - Skupno evropsko okolje za strokovnjake na področju informacijske in komunikacijske tehnologije v vseh sektorjih - 2. del: Vodilo za uporabnike

e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors - Part 2: User Guide

E-Kompetenz-Rahmen (e-CF) - Ein gemeinsamer europäischer Rahmen für IKT-Fach- und Führungskräfte in allen Branchen - Teil 2: Nutzerleitfaden

Référentiel des e-Compétences (e-CF) - Référentiel européen commun pour les profession-nels des technologies de l'information et de la communication dans tous les secteurs d'activité - Partie 2 : Guide de l'utilisateur

Ta slovenski standard je istoveten z: **FprCEN/TR 16234-2**

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e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors - Part 2: User Guide

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This draft Technical Report is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/TC 428.

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

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European foreword

This document (FprCEN/TR 16234-2:2020) has been prepared by Technical Committee CEN/TC 428 “ICT professionalism and digital competences”, the secretariat of which is held by UNI.

This document is currently submitted to the Vote on TR.

This document will supersede CEN/TR 16234-2:2016.

In comparison with the previous edition, the following technical modifications have been made:

- Review of all previously existing clauses and content in the light of the EN 16234-1:2019 and benefitting from multiple e-CF user experiences gathered and application feedback received.

This standard for ICT professional competence outlines the minimum requirements of competence (i.e. a threshold) in the work context. It includes typical knowledge and skills examples that are not standardized but provided to support orientation and understanding. When applying the standard, this approach must be recognized to clearly distinguish between which elements are mandatory and which are merely examples (represented by, shall versus should/may/can, etc.).

This European standard is made up of four parts:

- EN 16234-1 e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors - Part 1: Framework. It provides the e-Competence Framework (e-CF) published as a European Norm (EN).

- CEN/TR 16234-2 e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors - Part 2: User Guide. It provides the e-CF User guide published as a CEN Technical Report (TR).

- CEN/TR 16234-3 e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors - Part 3: Methodology. It provides the e-CF Methodology published as a CEN Technical Report (TR).

- CEN/TR 16234-4 e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors - Part 4: Case Studies. It provides a series of Case Studies illustrating e-CF practical use from multiple ICT sector perspectives published as a CEN Technical Report (TR).

Part 1 is fully standalone, and part 2, 3 and 4 rely on part 1.

Introduction

EN 16234 e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors 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.

In the complex environment of ICT professional skills development and management there is a need for clarity and simplification. Existing organisational processes have often been established in an ad hoc way over many years and lack connectivity to the wider community. The e-CF offers a way out of this dilemma, providing a neutral solution to overcome inertia and to establish a structured approach to ICT professional competence development.

This Technical Report offers direction on how to adopt the e-CF approach from multiple user perspectives. Clause 4 provides the executive overview of e-CF scope, target groups, underlying principles, concepts and structure, including entry points for using the e-CF (4.5). Clause 5 provides practical guidance for multiple applications of the standard among multiple target groups and from different stakeholder perspectives. Compelling reasons for adopting the e-CF are given in 5.1.2 (basic factors for successful implementation). Annex D of this document gives an overview of Case Studies published in a complementary document illustrating examples of e-CF practical application.

To support users and guide developers of applications of EN 16234-1 (e-CF), the following narrative provides an overview of the underpinning philosophy and principles adopted during the document's construction and maintenance. Understanding these guiding principles is equally important for applying the EN 16234-1 (e-CF) across multiple environments concerned with ICT professionalism.

EN 16234-1 (e-CF) Guiding Principles:

This standard is an enabler; it is designed to be a tool to empower users, not to restrict them. It provides structure and content for application by many users from organisations in the private and public sector, ICT user or ICT supply organisations, educational institutions including higher education and private certification providers, social partners and individuals. Across 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 holistic concept directly relates to workplace activities and incorporates complex human attitudes and resultant behaviours. Behaviour and attitude are important influences that facilitate successful knowledge and skills application. Within each competence, embedded attitudes are reflected in behaviour and enable the successful integration of knowledge and skills.

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, E.2. 'Project and Portfolio Management' does not represent the complete content of a 'Project Manager's' 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 generic competences are comprehensively articulated in other structures. Selecting competences for inclusion within this standard is therefore a pragmatic rather than an exhaustive process. The selection was based on engagement with 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 organisational perspective as opposed to an individual's perspective. Dimension 3 defines e-Competence levels and relates to the European Qualifications Framework (EQF), it provides a bridge between organisational and individual competences. Dimension 4 provides examples of knowledge and skills in the e-Competences of Dimension 2; they are not intended to be exhaustive but included for inspiration and orientation.

This latest version of the standard incorporates a new element, transversal aspects; these recognize the relevance of a number of important cross-cutting aspects and provide additional generic ICT related descriptors for successful application of e-CF competences in the workplace. Accessibility, Ethics and Security are examples of transversal aspects that may be applied flexibly to match the application context.

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 work proficiency levels of this standard has been systematically established to enable consistent interpretation of the EQF in the ICT workplace environment. It should be noted that an exact equivalency is not possible due to the different purposes and contexts of the EQF and the e-CF, but relevant relationship information is provided.

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 to it. Organisations deploying these downstream activities are reliant upon this standard and need to be confident of the continued sustainability of their processes. Updates to this standard must respect this requirement and ensure continuity by enabling continued use of the existing standard until 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 Digital Agenda for ICT professionalism; it is designed for use by any organization or individual engaged in ICT Human Resource planning and competence development.

1 Scope

This document supports understanding, adoption and use of EN 16234 (all parts) e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors which provides a common reference of 41 ICT professional competences as required and applied in the Information and Communication Technology (ICT) professional work environment, using a common language for competences, skills, knowledge and proficiency levels that can be understood across Europe.

This document supports Information and Communication Technology (ICT) stakeholders dealing with ICT professional competences from multiple perspectives, in particular:

— ICT service, demand and supply organisations;

— ICT professionals, managers and human resource (HR) departments;

— educational institutions, learning program and certification providers of all types including Vocational and Educational Training (VET), Higher Education (HE) and Continuous Professional Development (CPD);

— social partners (trade unions and employer associations);

— professional associations, accreditation, validation and assessment bodies;

— market analysts and policy makers;

— other organisations and stakeholders in public and private sectors across Europe,

to adopt, apply and use the framework in their environment.

2 Normative references

The following documents are referenced in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16234-1:2019, *e-Competence Framework (e-CF) — A common European Framework for ICT Professionals in all sectors - Part 1: Framework*

CEN/TR 16234-3:2021, *e-Competence Framework (e-CF) — A common European Framework for ICT Professionals in all sectors - Part 3: Methodology*

CEN/TR 16234-4:2021, *e-Competence Framework (e-CF) — A common European Framework for ICT Professionals in all sectors - Part 4: Case Studies*

CWA 16458-1:2018, *European ICT Professional Role Profiles — Part 1: 30 ICT profiles*

CWA 16458-2:2018, *European ICT Professional Role Profiles — Part 2: User Guide*

CWA 16458-3:2018, *European ICT Professional Role Profiles — Part 3: Methodology documentation*

CWA 16458-4:2018, *European ICT Professional Role Profiles — Part 4: Case studies*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16234-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Executive overview

4.1 EN 16234-1 (e-CF) scope and target groups

The EN 16234-1 (e-CF) provides a reference of 41 competences as required and applied in the Information and Communication Technology (ICT) professional work environment, using a common language for competences, skills, knowledge and proficiency levels that can be understood across Europe.

The EN 16234-1 (e-CF) was created for application by:

— ICT service, demand and supply organisations;

— ICT professionals, managers and human resource (HR) departments;

— educational institutions, learning program and certification providers of all types including Vocational and Educational Training (VET), Higher Education (HE) and Continuous Professional Development (CPD);

— social partners (trade unions and employer associations);

— professional associations, accreditation, validation and assessment bodies;

— market analysts and policy makers;

— other organisations and stakeholders in public and private sectors across Europe,

to adopt, apply and use the framework in their environment.

4.2 EN 16234-1 (e-CF) a fundamental pillar of ICT professionalism for Europe

The EN 16234-1 (e-CF) provides a common European language for ICT workplace-related competences, skills and proficiency levels as required and applied by organisations and professionals. In this way, all sector stakeholders, including public and private sector and individuals, have access to a shared reference.

In particular, the e-CF supports the articulation, definition and description of:

- jobs, role profiles, recruitment offers and needs and other types of competence specifications;
- training courses, qualifications, certifications and higher education curricula;
- career paths and professional development needs;
- formal and non-formal learning paths;
- competence gaps analysis at the individual, team or organisational level;
- education and training needs at the individual, team or organisational level;
- criteria for competence assessment and market-trend analysis, etc.;

- a shared reference to gather and present ICT professional competence need information, e.g. at national or large corporation level.

The EN 16234-1 (e-CF) and its supporting technical reports are an integrated component of the four ICT professionalism pillars for Europe. Figure 1 positions this standard with regard to the foundations required for the establishment of an ICT European Profession. It illustrates the connectivity between the four key elements; e-competences from the e-CF, education and training, professional ethics and the Body of Knowledge.

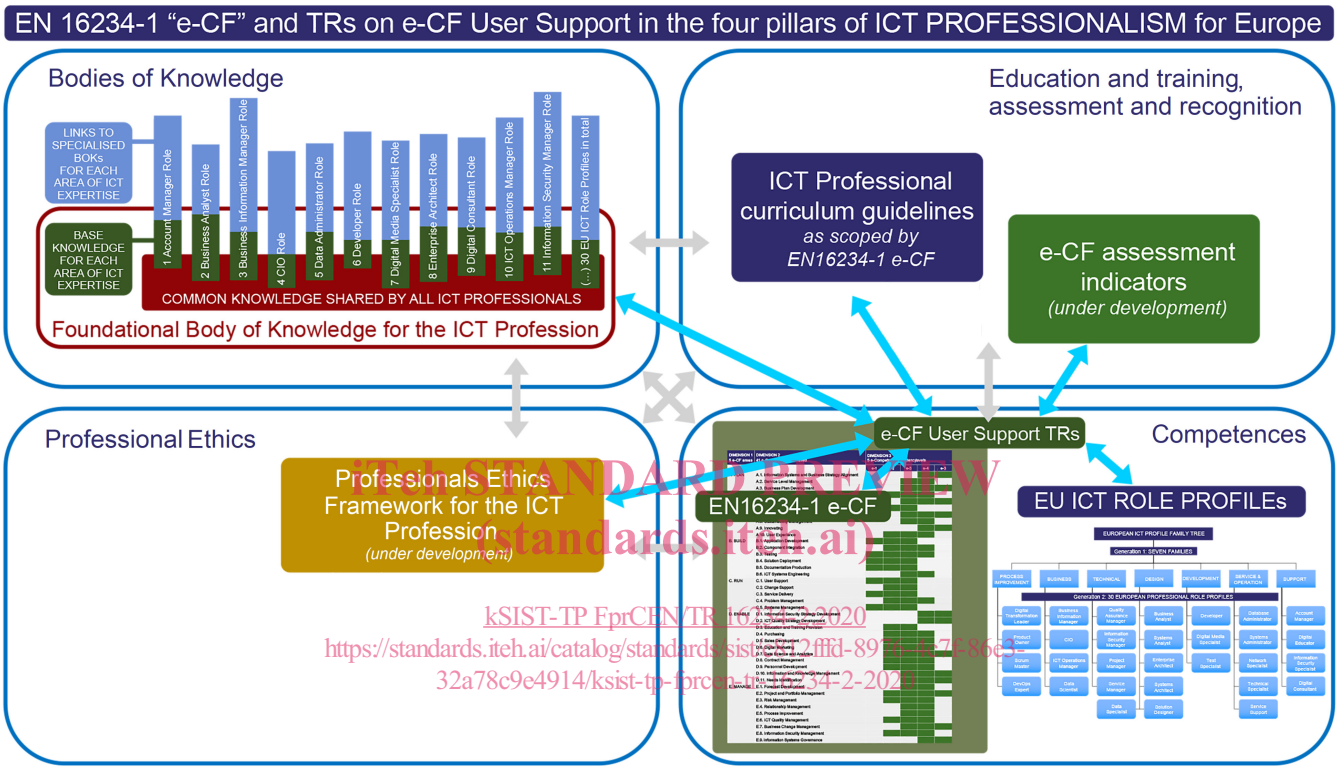

Figure 1 — EN 16234 (e-CF) and TRs an essential pillar of ICT professionalism for Europe

CEN/TC 428 "ICT Professionalism and digital competences" is responsible for all aspects of standardization related to maturing the ICT Profession in all sectors, public and private. It harmonises activity related to the four major building blocks of ICT Professionalism: (1) competences represented by the e-CF (2) education and training, (3) Code of Ethics and (4) Body of Knowledge (BoK).

In the context of CEN/TC 428 continuous work is taking place to support the ICT Profession in Europe with solid references and standards around all four basic pillars of ICT Professionalism. The EN 16234 (e-CF) series is consistently connected in concept and definitions with all the other deliverables published in CEN/TC 428 context (e.g. WI00428010 "European Foundational Body of Knowledge for the ICT Profession", the "ICT Professional Ethics Framework"), and the CWA 16458 European ICT Professional Role Profiles.

4.3 EN 16234-1 (e-CF) structure, content and application opportunities

4.3.1 EN 16234-1 (e-CF) overview: structure, content

The EN 16234-1 (e-CF) is structured across four dimensions. The dimensions reflect areas of business and human resource planning and incorporate job and work proficiency guidelines specified in the Table 1.

EN 16234-1 (e-CF) is complimented by the inclusion of a component, the transversal aspect, that provides basic generic ICT descriptors for enhanced application of e-CF competences in a workplace context.

Table 1 — The EN 16234-1 (e-CF) four dimensions and transversal aspects

Dimension 1: 5 e-Competence areas *MAY APPLY*	Derived from the ICT macro processes PLAN – BUILD – RUN – ENABLE – MANAGE. The areas provide the entry point to e-Competences and reflect a process perspective based upon a waterfall approach. However, the e-CF is equally relevant to steps applied within agile process structures such as Agile/ DevOps lifecycles.
Dimension 2 41 e-Competences *SHALL APPLY*	41 e-Competences provide the European standard references for ICT professional competence as required and performed in an ICT work context. Each dimension 2 description contains a competence title and a generic competence description, defined from an organisational perspective.
Dimension 3 5 e-CF proficiency levels *SHALL APPLY*	5 e-Competence proficiency levels are characterised by increasing levels of context complexity, autonomy, influence and typical behaviour. Relevant proficiency levels are assigned to each competence description. Dimension 3 level descriptors provide individual competence performance indicators.
Dimension 4 knowledge and skills examples *MAY APPLY*	Examples of knowledge and skills relate to the e-Competence generic descriptions in Dimension 2. Examples are provided to add value to the competence descriptor but are not intended to be exhaustive. They offer inspiration and orientation for the identification of further specific knowledge and skills assignment according to contextual needs.
Transversal aspect components provide basic generic ICT related descriptors for successful application of e-CF competences in the workplace. *MAY APPLY*	

The four-dimensional structure plus transversal aspects of the EN 16234-1 (e-CF) offer comprehensive insight into the competence requirements of organisations and executed by ICT professionals. The core of the framework is the 41 competence descriptors found at the heart of the structure articulated in dimension 2. This dimension, complemented by the remaining three, provides a common start point for initial understanding of the EN 16234-1 (e-CF).

Figure 2 illustrates the content of a typical competence, A.2. Service Level Management, it shows how the central dimension 2 provides the competence description and how this can be further articulated in dimension 3, at different proficiency levels 3 and 4 (in this example). Furthermore, examples of knowledge and skills listed in dimension 4, provide complimentary content to the core competence descriptions within dimension 2. Figure 2 provides an example of e-Competence description in all four dimensions.

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 tailored to 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	**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 elements forming the metrics of service level agreements K4 how service delivery infrastructures work K5 impact of service level non-compliance on business performance				
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				

Figure 2 — EN 16234-1 (e-CF) e-Competence example A.2. Service Level Management

The 41 competences defined by EN 16234-1 (e-CF) are constructed in the same way, consisting of 4 dimensions as described previously. Table 2 represents the e-Competence Framework overview, it demonstrates that although the format of each competence is similar, the quantity and level of dimension 3 descriptors vary according to workplace relevance.

Table 2 — EN 16234-1 (e-CF) table overview

DIMENSION 1 5 e-CF areas	DIMENSION 2 41 e-Competences identified	DIMENSION 3 5 e-Competence proficiency levels				
		e-1	e-2	e-3	e-4	e-5
A. PLAN	A.1. Information Systems 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. Sustainability Management			■	■	
	A.9. Innovating				■	■
	A.10. User Experience		■	■	■	
B. BUILD	B.1. Application Development	■	■	■		
	B.2. Component Integration		■	■	■	
	B.3. Testing	■	■	■	■	
	B.4. Solution Deployment	■	■	■		
	B.5. Documentation Production	■	■	■		
	B.6. ICT Systems Engineering			■	■	
C. RUN	C.1. User Support	■	■	■		
	C.2. Change Support		■	■		
	C.3. Service Delivery	■	■	■		
	C.4. Problem Management		■	■	■	
	C.5. Systems 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 Development		■	■	■	
	D.6. Digital Marketing		■	■	■	
	D.7. Data Science and Analytics		■	■	■	■
	D.8. Contract Management		■	■	■	
	D.9. Personnel Development		■	■	■	
	D.10. Information and Knowledge Management			■	■	■
	D.11. Needs Identification			■	■	■
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. Information Systems Governance				■	■

In addition to the four dimensions, transversal aspects provide basic generic ICT descriptors for successful application of e-CF competences in a workplace context.

Transversal aspects are represented by statements that complement the descriptors of dimension 2. Figure 3 illustrates the seven transversal aspects, which are applied to every competence either from the standpoint of being 'aware of' or 'behaving proactively' with regard to context.

Figure 3 — Transversal Aspects applying across the entire framework

4.3.2 EN 16234-1 (e-CF) alternative view – the conceptual perspective

The EN 16234-1 (e-CF) may be broadly considered from two perspectives, the conceptual viewpoint or the application viewpoint.

The conceptual perspective focuses upon the dimensional construct of the framework and the underpinning definitions of each component which may be used to understand the genesis of the e-CF and the relationships between each of its key elements as illustrated in Figure 4.