Main CEN „European ICT Professional Profiles in action“ project aim is to maintain and enhance the quality, maturity, usability and stakeholder outreach of the „European ICT Professional Profiles“ CWA 16458. The final project deliverables will be provided in CWA format, replacing the CWA 16458 currently in place. The "European ICT Professional Profiles" CWA update will be composed by the following four main elements.

1. European ICT Professional Profiles second release
2. User guidelines for the European ICT Professional Profiles (sector-specific and generic)
3. Methodology documentation of ICT Professional Profiles construction
4. Case studies illustrating ICT Profiles use in practise

This report is presented by the CEN nominated expert team

Jutta Breyer (project and expert team leader), Rocco Defina, Terry Hook, Frédéric Lau, Clare Thornley, Riccardo Scquizzato.

www.ecompetences.eu/ict-profiles-update
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Annex A. Statistical results from the ICT Profiles user community on-line survey
1. Introduction

1.1. „European ICT Professional Profiles in action“ background and rationale

The “European ICT professional Profiles in action” project of the CEN ICT Skills Workshop has received EC/ EFTA\(^1\) funding and directly contributes to the goals defined by the Rolling Plan 2015 for ICT Standardization\(^2\), Section 3.2.5. “e-Skills and e-Learning”. Under (A) Policy Objectives, it is stated, “The development and the promotion of ICT professionalism requires strong consensus and cooperation among Member States.”

In particular, at page 45, Section D.2., Regarding e-Skills, Action 2, public and private sectors are invited to collaborate on the following topic: “e-Competence Framework: Maintain the e-CF and continue work on job profiles, qualifications and certifications, methods and tools for the development, promotion, implementation and maintenance of the e-Competence Framework with a view in particular to promote ICT professionalism (including international cooperation).”

Building upon the European Commission’s strategic, legislation and policy communications on the topic and with the European e-Competence Framework (e-CF) version 3.0 (published as EN 16234-1:2016 superseding CWA 16234:2014) and European ICT Professional Profiles first release (CWA 16458:2012) together with further multi-stakeholder developed pan-European concepts as key contributors, this project continues the work on a generic set of European agreed ICT Profiles for multiple stakeholder application and reference, and to publish the main project result as European ICT Professional profiles second release in CEN Workshop Agreement (CWA) format.

The prime objective of the CWA 16458:2012 update is to continue increased transparency and the convergence of the European ICT Skills landscape by providing a second, updated release of the generic European ICT Professional Profiles in line with current market and business needs.

As a response to the huge number of ICT Profile Frameworks and Profile descriptions used today in European ICT Business and Qualification systems, the CWA provides a reduced number of representative generic ICT role Profiles covering, at their level of granularity, the full ICT Business process. In consequence, CWA 16458:2012 defines a set of European ICT Professional Profiles;

- using the European e-Competence Framework (e-CF) as the basis for competence identification; and
- illuminating and structuring each ICT Professional Profile with a number of components including observable work outcomes or “Deliverables”.

The 23 generic European ICT Professional Profile descriptions reflect the top of a European ICT Profile family tree. The profiles are used by ICT multi-stakeholders for reference, or alternatively as a starting point to develop further ICT professional profile generations for specific environments.

\(^1\) European Free Trade Association
Since CWA publication, in the first half of 2012, the pan-European set of 23 ICT Professional Profiles for multi-stakeholder reference have been very well received by the European ICT sector community.

At the policy development level, the study “e-Skills and ICT Professionalism. Fostering the ICT Profession in Europe” carried out by IVI and CEPIS on behalf of the European Commission in 2012/13, recommended integration of the ICT Professional Profiles published by CWA 16458:2012 into the European long-term vision of ICT Professionalism.

The primary reasons for further developing the professional profiles presented in CWA 16458:2012 is

- to maintain the mutual compatibility between the two integrated and related structures of a) ICT Professional Profiles and b) EN 16234-1:2016 (e-CF version 3.0),
- to verify and where possible increase the overall maturity of the concepts established in the project’s first release, and
- to provide a continued guarantee of relevance to current ICT business practise.

1.2. Project objectives and deliverables

The ultimate objective of the “European ICT Professional Profiles in action” project is to maintain and enhance the quality, maturity, usability and stakeholder outreach of the existing CWA 16481:2012 and to replace this by an updated version, providing the second release of European ICT Professional Profiles including enhanced user guidance.

Building on previous significant CEN ICT Skills Workshop and TC 428 “Digital competences and ICT Professionalism” achievements, with the European ICT Professional Profiles first release published as CWA 16458:2012 and the EN16234-1 European e-Competence Framework standard published in 2016 as the key contributors, this project addresses two prime objectives (including further specification of objectives and subset aims):

1. European ICT Professional Profiles update
   a) Verifying the current profile scheme, profile descriptions and families classification
   b) Systematically collecting and evaluating practical user experience
c) Considering new emerging trends

d) Further specification of KPI area

e) Alignment with/ connection to the forthcoming new ESCO construct

2. Enhanced user guidance

   a) ICT sector specific guidance: Steps necessary to build profiles that add value to organisations
   b) Generic guidelines for profile creation across sectors
   c) ICT Profiles use - Case studies
   d) ICT Profiles development – methodology documentation

In line with these key objectives and subset aims, four final key deliverables will be provided in CWA format.

1. European ICT Professional Profiles second release (CWA Part 1)
2. User guidelines for the European ICT Professional Profiles, sector-specific and generic (CWA Part 2)
3. Methodology documentation of ICT Professional Profiles construction (CWA Part 3)
4. Case studies illustrating ICT Profiles use in practise (CWA Part 4)

1.3. A European multi-stakeholder process – parties and expert resources involved

Significantly benefitting from the practical success of e-CF implementation, the European ICT Professional Profiles first release development quickly gained the active support of experienced and qualified contributors from the European ICT business and HR environment. Many stakeholders and experts contributed on a voluntary basis as they anticipated that the output would provide clear added value to their daily business and work activities. Contributors to the ICT Professional Profiles development came from multiple work perspectives and countries across Europe. Contributors came from companies, associations, research, qualification and certification institutions, etc., among them CIGREF, PSA Peugeot Citroen, EuroCIO, BITKOM, EXIN International, Microsoft, Cisco, IG Metall, Fondazione Politecnico di Milano, Cap Gemini, Pôle Emploi, European e-Skills Association, Airbus, AFPA, Banca d’Italia, Cepis, Michelin, Université de Brest, PIN SME, IPA Japan.

This strong expert and stakeholder involvement on multiple levels, for profile construction, is consistent with the very positive ICT multi-stakeholder feedback received on practical application since the first publication of the European ICT Professional Profiles in 2012. It provides also an excellent basis for further engaging with the European ICT multi-stakeholder community for the ICT profiles update in the context of this project.

Project progress and sense checks in terms of quality and market relevance of work in progress, in close interaction with ICT and HR business representatives and further interested European multi-stakeholders, is assured by a four level approach to technical CWA development and multi-stakeholder approval:

1. The CEN nominated expert team, composed of 6 members in total, is responsible for CWA development.

2. The expert team is supported by several highly qualified external experts coming from ICT business and HR environment, enriching the expert team perspectives on a voluntary basis by additional insight, experience and expert opinion. They join the expert team members in expert workgroup meetings and also contribute to work in progress between meetings, depending on their level of interest and availability in engaging.

3. Largely experienced in the technical field of ICT business and the ICT Professional Profiles development and benefitting from the voluntary expert contribution, the CEN nominated expert team is enabled to develop mature proposals to the CEN ICT Skills Workshop. This
initiates the next important process step of further commenting and results optimization in close interaction with the CEN ICT Skills Workshop Community.

4. Finally, dissemination support by CEN Workshop members and interaction of the project leader with around 500 stakeholders from Europe and also some from overseas participating on various occasions (invitation to participate in the ICT Professional profiles user feedback on-line survey, public CWA commenting phase) assures an interaction that goes beyond the ICT Workshop members for largest possible consolidation and acceptance of results.

Figure 2: The “European ICT Professional Profiles in action” project – Working structure, meeting and interaction platforms, experts and stakeholders involved

The on-line survey, CEN nominated expert team and expert workgroup meetings, CEN ICT Skills Workshop meetings and further technical multi-stakeholder feedback gathering workshops are visible milestones and important steps for overall project progress.

2. Work program and project performance

2.1. Technical project plan 12/2016 – 04/2018: aims, scheduling and steps completed

The „European Professional Profiles in action” project officially started in January 2016 with contract signment between the European Commission and the standardization organisations involved.

Technical project work to be performed by the CEN nominated expert team started in December 2016 with considerable delay, 7 months later than initially planned, but immediately after
communication of results of the expert team selection process. An administrative interim report was provided by AFNOR in line with initial project scheduling from November 2016.

To ensure consistent technical project performance; in close interaction with the European ICT stakeholder community and within a realistic timeframe, a project extension until April 2018 was approved by the European Commission.

This technical interim report, rescheduled in agreement between the CEN ICT Skills Workshop, CEN, the European Commission, AFNOR and the project expert team, for June 2017, adjusts original task planning and milestones to this new project timeframe. It focuses on the technical performance of project progress from expert team work commenced in December 2016 until final delivery of the approved CWA planned for April 2018.

**Table 1: Readjusted technical project plan including milestones. Gantt: December 2016 (12/16) – April 2018 (04/18)**

*Achieved project milestones are marked in grey.*

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**C Provide enhanced user guidance**

1. Case studies

   1a. Gain relevant user experience – good practise examples
   
   1b. Identify main relevant stakeholders perspectives appropriate for case studies
   
   1c. Develop case studies
   
   1d. Seek stakeholders feedback
   
   1e. Optimise the case studies in accordance to feedback received

2. Edit sector specific and generic guidelines for profile use and development

3. Develop methodology documentation

**D Consensus-building, user support and communication**

1. On-going multi-stakeholder
### Milestones

**Milestones A to E and K** are achieved by this date of interim report delivery in line with the project planning. They are further detailed in the following sub-chapters.

- A – Project team established
- B – On-line survey closed and results available
- C – Results from user feedback workshop available
- D – Structured feedback mechanism
- E – All feedback collected and systematically structured
- K – Interim report delivered to CEN/EC

**Milestones F to I and L to N** will be achieved in the second phase of the project following interim report acceptance:

- F – European ICT Professional Profiles updated based on gathered information
- G – Case studies published
- H – User guidelines available
- I – Methodology documentation available
- L – Final project report delivered to CEN/EC
- M – Draft CWA (PrCWA) available for public commenting
- N – Final draft CWA (FPrCWA) for formal approval
2.2. Project milestones: The expert meetings held in Paris and Rome

The technical expert meetings are considered as project milestones and are essential components of work progress. The technical work meetings are mainly organised over two days. On the first day the CEN nominated expert team members meet, review and agree work achievements to date. This agreement provides the input for the following day’s meeting of the larger technical expert working group. To achieve an appropriate, “European” ambiance, independent of national and regional influences, the meetings take place in different locations across Europe.

The Paris meeting in February 2017, kindly hosted by CIGREF, was the kick-off for a set of technical expert meetings to be held during 2017.

The most important initial aims were to create a common understanding of the “European ICT Professional Profiles in action” project objectives on a technical level, to identify the most relevant questions, hypothesis and first agreements on areas of specific importance for the ICT professional Profiles update and complementary material development (user guide, methodology documentation, case studies). It was also an opportunity to analyse and discuss together in more detail other relevant e-Skills initiatives that may be of relevance to the European ICT Professional Profiles update from political, content and/or user perspective viewpoint. Further detail on this is specified in chapter 3.1.

The outcome of the Paris meeting was an agreement on next steps at the CEN technical experts level in order to prepare first valuable input for discussion during the Rome expert meeting in May 2017 where further voluntary experts would participate.

The Rome meetings in May 2017, kindly hosted by Confindustria Digitale and ASSINTERN, provided an opportunity to systematically discuss and further consolidate expert team work performed by now, and, very importantly, all the valuable feedback collected from ICT professional Profiles users via the on-line survey and a user feedback workshop held the day between the expert team and expert workgroup meetings at the same location. The outcome of this intensive three-days meeting was a first agreement on the main ICT business trends to be considered. First detail on this is specified in chapter 3.2. In addition further useful suggestions for the achievement of a high-quality update and the implementation supporting documentation were shared including the basis for agreement on possible new profiles to be added to the current 23.

2.3. ICT Profiles user feedback collection

2.3.1. Online survey 02 – 04/2017

To collect additional input on the European ICT Professional Profiles first release current user experience and improvement potential, a stakeholder on-line survey ran from 24th of February until 20th of April 2017.

The survey addressed the following issues

- Respondent profile and background of ICT profiles application experience
- Feedback on the current profiles and family approach
- Feedback on the template applied for profiles description
- Suggestions regarding improvement of existing profiles
- Suggestions regarding new profiles and deliverables to be included in the next version
- Any recent technology trends and business developments to be specifically considered (e.g. cloud computing, big data, etc.)
- Stakeholder motivation to share user experiences by active participation in the user feedback workshop, updating process, case studies development, etc.
Suggestions regarding the service level and further implementation of the European ICT Professional Profiles in EU environment

The survey has added vital evidence of the current and potential value that European ICT Profiles bring to the field of ICT professional development. Limited statistical evidence exists with regard to the processes deployed by employers to effectively manage their ICT professional workforce. The feedback from this survey provides a snapshot of the ways in which some organisations systematically seek ways to address skills requirements, gaps or shortages. Some survey outcomes are still under evaluation, however, the expert team members are already confident that they provide valuable input for the European ICT Professional Profiles update and will also provide inspiration on future developments and activities related to ICT Profile implementation and use across Europe. More detail on the survey results can be found in chapters 3.2 and 3.3.

2.3.2. ICT Profiles user feedback workshop in Rome

The ICT Profiles user feedback workshop on 4th May 2017 in Rome provided a unique opportunity to exchange and discuss relevant European ICT Professional Profiles user experiences with a broader group of known ICT Profiles users in an appropriate technical context. The aim of the meeting was to collect and discuss detailed technical application feedback in a structured environment in order to directly influence the forthcoming European ICT Professional Profiles update.

27 participants (from Assinter Italia, Observatoire Européen des Métiers de l’Economie Numérique, Confindustria, Poste Italiane, Irish Computer Society, Fondazione Politecnico di Milano, CIAPE, EXIN, CIGREF, Engineering Ingegneria Informatica SpA, Università degli Studi di Milano-Bicocca, Certipass, AgID, netmind, Institut PI, AICA, Cap Gemini, Tekom, IVI, Assinform and further CEN nominated expert perspectives) from seven European countries (Ireland, France, Italy, Germany, Spain, UK, The Netherlands) came together to exchange their ICT profiles application experiences and to make suggestions for ICT Profiles updating from different perspectives.

Figure 3: User feedback workshop hosted by Confindustria and Assinform on 4th May 2917 in Rome

The selected composition and diversity of the group made it possible to cover the majority of ICT Professional Profile applications in current use.

Following a round table discussion, sub-teams were built to investigate two key questions with subset points from different perspectives:

1. Your experiences: Do the ICT Profiles for your purposes work as they are?
   1.a. What is good?
   1.b. What does not work? Why?
2. Your visions and recommendations for the next version
   2.a. New trends in business and technology to be considered?
   2.b. New profiles?
   2.c. Suggestions for improving the template?
   2.d. Your proposals for the user guide?

These guiding questions were explored by six work teams covering the following perspectives:

1. HR management & development
2. Consultancy & research
3. Policy making
4. Qualification & certification
5. Assessment & career guidance/ development
6. The ICT Professional perspective

All teamwork generated interesting results which fed a first plenary discussion and additionally the expert discussions of the second workgroup meeting, hosted at the same location the following day. The details are currently under scrutiny by the CEN nominated ICT Profiles expert team in order to inform the forthcoming ICT Profiles update and complementary material development for enhanced user guidance. The early direction taken is explained in more detail in chapters 3.3. and 3.5.

2.3. Work between the meetings and further meetings planned

Whilst the two-day-workshops between CEN experts and members of the technical expert working group represent observable milestones of the technical project work, the work between meetings is equally crucial. Each meeting has an intensive follow-up where the most important results are synthesised and summarised reflecting common agreements. Where relevant, the experts continue to work in sub-teams, e.g. for advancing first proposals in the fields of updating deliverables and existing ICT profiles, developing new profiles of relevance to current ICT business practice, user guidance, case studies and methodology documentation development.

The project team leader facilitates and provides direction for further work, encompassing next steps and expected outcomes and also prepares for the next meeting. The experts are experienced in virtual communication techniques and maintain contact through e-mail and conference calls.

Until the accomplishment of the “European ICT Professional Profiles in action” project including “European ICT Professional Profiles second release” CWA publication in April 2018, two more technical expert working meetings are planned. The third meeting is planned on 21 and 22 September in Dublin, kindly hosted by Irish Computer Society, firm dates and aims of the final expert meeting will be established based on work progress.

2.4. Interaction with the CEN ICT Skills Workshop and EU multi-stakeholder Community

Following the first consolidation of technical outcomes on a technical level, they are presented, re-discussed and further consolidated within the CEN workshop stakeholder community. CEN plenary meetings provide the key opportunity to regularly report on and to review the project work in progress. “European ICT Professional Profiles in action” project plans and work progress were presented and discussed at the CEN plenary meetings in November 2016 and March 2017 in Brussels. The next CEN ICT Skills Workshop meeting is planned for 15th of September 2017 in Paris.

Further detailed discussions and collection of ICT stakeholders’ feedback and input on the project work achieved is planned in the context of an open technical session in December 2017 or January 2018, kindly hosted by the European Commission in Brussels, when the first consolidated expert
drafts of the forthcoming “European ICT professional Profiles second release” for further adjustment by European multi-stakeholder feedback in all four CWA parts will be available.

3. Interim outcomes achieved – overview on technical project progress

3.1. Other relevant European e-skills initiatives providing input to the update

Several e-skills initiatives exist in Europe, under the umbrella of the Digital Agenda for Europe and the Digital Skills and Jobs Coalition\(^1\). It is crucial, in the updating of ICT Professional Profiles, to take in consideration the main results from these initiatives, in order to:

- reinforce the existence of a European embedded environment on this topic, providing a common view and synergy, maximizing the results and investment from many stakeholders;
- facilitate the common use of concepts and giving, whenever possible, clear evidence of the existing relationship between different sources, documents and perspectives;
- increase the quality of ICT Profiles content, by assuring they are in line with all the recognized relevant trends for market and the profession development needs.

The following, non-exhaustive, list includes the main initiatives and key publications that have been taken in consideration as input for the ICT Professional Profiles updating.

- **Development and Implementation of a European Framework for IT Professionalism (2017 Capgemini, EY and IDC)**\(^4\)

  The project has been carried out for European Commission, Directorate General Internal Market, Industry, Entrepreneurship and SME and aimed to achieve three objectives:

  1. Updating key indicators and progress on the situation concerning the IT profession based on the latest data, trends and developments, regarding the evolution of the supply and demand of IT professionals in Europe, the situation concerning IT industry training and certifications and the evolution at international level including an analysis and comparison of the situation for Canada, Japan, USA, Germany, France and UK.
  2. Provide a clear view for development and implementation of the four foundational building blocks\(^5\) that provide a first comprehensive European framework for IT professionalism:
     - Body of knowledge;
     - Education, Training and certifications;
     - Competences;
     - Professional Ethics.
  3. Establishment of a group of leading European experts in this field from key stakeholders, government, academia and industry to assist in the development and the implementation of the framework in Europe, coordinate actions and prevent fragmented initiatives.

- **High-Tech Leadership Skills for Europe (2017, by Empirica, pwc and IDC)**

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\(^1\) The Digital Skills and Jobs Coalition brings together Member States, companies, social partners, non-profit organisations and education providers, who take action to tackle the lack of digital skills in Europe. 

\(^4\) Service contract EASME/COSME/2014/012

\(^5\) The four building blocks have firstly been defined in the report "e-Skills and IT professionalism: Fostering the IT profession in Europe" (2012). The document is the final report of a project carried on by CEPIS and the Innovation Value Institute that may be considered as one of the key milestone to take in consideration on IT professionalism. The main results from the project have been the starting point for taken in consideration by succeeding projects.
The document provides a summary of the state-of-the-art of high-tech leadership skills in Europe, and it highlights concrete proposals for action and how best to implement an EU-wide agenda at Member State and European level. These proposals are based on the results of a consultation process in which experts shared their experiences and their visions on high-tech leadership skills towards 2020 and beyond.

- **e-Skills: European Foundational ICT Body of Knowledge (2015, by Capgemini and EY)**
  This European Foundational ICT Body of Knowledge serves as an entry point for anyone contemplating a career in ICT, and entering from other professions; facilitates communication between and understanding of ICT professionals in Europe in whatever sector they are active, thereby reducing risks and strengthening ICT professionalism; and helps to increase the supply and pool of ICT professionals by contributing to a better perception of ICT jobs.

  In this report Empirica describes the development of e-Skills in Europe, both for ICT practitioners and for e-leadership skills, looks at changes in numbers of ICT students and graduates as a major source of talent entering this workforce, and elaborates trends of e-Skills and e-leadership skills demand and supply to update a foresight scenario and forecast until 2020. It describes the development of e-Skills in Europe, both for ICT practitioners and for e-leadership skills, look at changes in numbers of ICT students and graduates as a major source of talent entering this workforce, and elaborate trends of e-Skills and e-leadership skills demand and supply to update a foresight scenario and forecast until 2020.

- **e-Skills in Europe: Measuring Progress and Moving Ahead (2014, Empirica)**
  In this study the supply and the demand of e-skills across Europe are monitored and the policy initiatives and multi-stakeholder partnerships in the European Union are benchmarked. It also analyses the evolution of the supply and demand in the last ten years. This report provides: a better understanding of the initiatives launched at EU and national level since 2008; proposals for new approaches (wherever appropriate) to remedy the situation; and elaborates on successful ways and efficient means to foster multi-stakeholder partnerships to reduce e-skills shortages, gaps and mismatches.

- **e-Leadership: e-Skills for Competitiveness and Innovation March 2013, Empirica, IDC, INSEAD**
  This is the final report of the study: 'Vision, roadmap and foresight scenarios for Europe 2013-2020' (eSkills Vision). The key objective of this study is to help reduce innovation skills shortages, gaps and mismatches in Europe, by providing sound, unbiased empirical evidence on how the supply and demand for different types of ICT-related skills is evolving in Europe under different socio-economic scenarios. A sufficient skills base in this domain is an important enabler for competitiveness and innovation in Europe. The evidence delivered by this study shall encourage and facilitate the dialogue and cooperation between policy makers and relevant stakeholders at the EU and national levels about the implications and required actions to be taken to address current as well as anticipated skills gaps and shortages. A special focus of the study is on higher-level innovation skills (which are called “e-leadership skills”) next to the analysis of the supply-demand developments for ICT practitioner and ICT user skills.

- **Towards European Quality Labels for ICT Industry Training and Certification (Empirica, EXIN 2013)**
  This document is the Report of the project ‘Quality Labels for Training Fostering e-Skills for Competitiveness and Innovation’ The ultimate objective of the study is to develop quality labels for industry-based training and certification (IBTC). Providing a road map towards quality labelling in the IBTC domain is expected to support further integration of industry-
based training into vocational education and training systems, improving transparency and transferability of qualifications in Europe. The study also provides a reliable picture of e-Skills IBTC supply and demand across Europe, map IBTC offers to the European e-Competence Framework and provide the prototype of an online service to stakeholders.

- **e-Skills and ICT professionalism: Fostering the ICT profession in Europe (2012, by CEPIS and Innovation Value Institute)**
  
  This project reflects parallel efforts to mature the ICT profession in other parts of the world, such as TechAmerica in United States and ITA in Japan. This project aimed to supporting the development of a European framework for ICT professionalism, with the goal of enhancing professionalism and mobility across Europe. The project also incorporates proposals to support the development of a European training programme for ICT managers.

- **e-CF COUNCIL (e-CF Alliance)**

  The project, funded by ERASMUS+ program and led by Fondazione Politecnico di Milano, intends to establish a stable alliance in the ICT sector gathering the key market players across Europe, i.e. social partners, regulatory bodies, VET organisations, research centres. The e-CF COUNCIL specific goals and outcomes are:
  
  o The design of a common reference scheme (e-CF COUNCIL scheme) for vocational qualifications and certifications, including prior learning recognition;
  
  o The design of a set of EQF-based Learning Units related to about 15 e-competences selected from the e-CF 3.0 e-competences;
  
  o The design of a pilot joint vocational qualification based on the e-CF COUNCIL scheme, identified within the ESCO IT Occupations, and including a subset of the selected e-competences with the properly related reference learning units;
  
  o The development of the related learning/training content for each selected learning unit, feeding the e-CF COUNCIL open content repository;
  
  o The development of a transnational pilot blended training initiative focused on the pilot qualification’s targeted e-competences and learning units, using the e-CF COUNCIL open content;
  
  o The development of the assessment process for each e-competence included in the pilot qualification.

  The project is expected to end in November 2018.

- **E-SKILLS MATCH**

  The project is funded by Erasmus+ Program and delivered by a Consortium led by Stockholm University. The general objective is to develop and demonstrate a European-wide learning technology system, dynamically adapted to changes occurring in job labour market classifications that will support (re-) training for acquiring the necessary e-Skills and digital competences to access the desirable jobs within the ICT sector.

  The project will develop a system that classifies ICT skills and digital competences achieved through formal, non-formal and informal learning and enable them to be related to

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1 The e-CF COUNCIL project is delivered by: Fondazione Politecnico di Milano, CEFRIEL, CNA-ICT, ADFOR S.p.A., FIOM Lombardia (Italy), ESI Center Eastern Europe, Bulgarian Association of Software Companies – BASSCOM, National Agency for Vocational Education and Training – NAVET (Bulgaria), bTa Center, CIOMET, EXIN (Netherlands), University of Alcalá – UAH, Services Federation of CCOO, DG Formacion – Comunidad de Madrid (Spain), PIN-SME, DIGITAL EUROPE (Belgium).

2 Following organization are part of the Consortium: Stockholms Universitetet, Fondazione Politecnico di Milano, Universidad de Alcalá, Adfor, Government To You Aisbl.
qualifications and occupation in the ICT sector and to open learning and training systems that provide these skills and competences. Final report is expected in Autumn 2017.

- The EDISON project

Edison is an initiative designed to accelerate the creation of the data science profession. Supported by the European Commission the project has a core consortium of seven partners, University of Amsterdam, University of Southampton, University of Stavanger, EGI, Delta Engineering, FTK and Inmark Europa.

An output of the initiative is the development of the EDISON collection an expanding volume of reports and descriptions that collectively make up and support the EDISON Data Science Framework (EDSF).

Given the increasing relevance of data management to the ICT domain (see 3.2.2) EDISON has the potential to inform the update of ICT Professional Profiles. In consequence representatives of each project have attended each other’s project. This exchange of ideas and concepts enriches each initiative and facilitates alignment and common technical understanding. [www.edison-project.eu](http://www.edison-project.eu)

**Relevant Global e-Skills initiatives and projects**

- **Japanese i-Competency Dictionary** Japan, Information Technology Promotion Agency (IPA) i-CD

IPA released “i Competency Dictionary (iCD) “as a structured dictionary composed of the “Task Dictionary” and the “Skill Dictionary”. The iCD is the result of the IPA investigation about the ideal way of the skill standard in the IT human resource development. The iCD suggests Tasks, Skills, Roles, and Jobs needed for not only the conventional business model such as system integrator but also the new age business models such as security, cloud, and data science. [https://www.ipa.go.jp/english/humandev/icd.html](http://https://www.ipa.go.jp/english/humandev/icd.html)

- **Skills Framework for the Information Age (SFIA)**

A skills framework with eco-system of partners. It has value add components that include the capacity to develop job profiles and career pathways. [https://www.sfia-online.org/en/reference-guide](http://https://www.sfia-online.org/en/reference-guide)

- **Canada**

The ICTC Information and Communications Technology Council has an IT occupational framework (e talent). Under each of the categories is a long list of sample job titles and a link to where current employment is (sector plus geography) and also to current vacancies and relevant courses (post secondary). [http://www.etalentcanada.ca/occupation-overview/](http://http://www.etalentcanada.ca/occupation-overview/)

**Relevant policy reports**

- **DIGITALEUROPE AND THE EC’S SKILLS STRATEGY 2016 - Recommendations from DIGITALEUROPE - Boosting the skills for the future of digital Europe** (January 2016, Digital Europe)

This position paper articulates recommendations to the European Commission for closing the digital skills gap. Concrete recommendations for actions that could be included in the European Commission’s Skills Strategy to be published in May 2016.

These recommendations reflect, among others, Digital Europe’s work under the Grand Coalition for Digital Jobs and the e-Skills for Jobs campaigns, two European Commission initiatives that have already contributed to reduce the digital skills gap in Europe.

The Future of Jobs Report is a first step in becoming specific about the changes at hand. It taps into the knowledge of those who are best placed to observe the dynamics of workforces—Chief Human Resources and Strategy Officers—by asking them what the current shifts mean, specifically for employment, skills and recruitment across industries and geographies. In particular, the initiative has introduced a new measure—skills stability—to quantify the degree of skills disruption within an occupation, a job family or an entire industry. The report provides also an outlook on the gender dynamics of the changes underway, a key element in understanding how the benefits and burdens of the Fourth Industrial Revolution will be distributed.

Relevant ISO standards

There are a number of ISO standards that are particularly relevant to ICT and there are also more generic ISO standards, for example around management and quality management that are relevant, particularly at the higher levels of seniority within the ICT Profiles. A selection that have been identified so far are indicated below at the level of a reference to the appropriate standard rather than a detailed analysis of the particular sections.

Standards of direct relevance to ICT

• ISO/IEC 27000 family - Information security management systems
  Within this group (family) of standard there a range of standards of relevance to ICT security management. ISO/IEC 27001 is the best-known standard in the family providing requirements for an information security management system (ISMS).

• ISO/IEC TR 19759:2015 Software Engineering - Guide to the software engineering body of knowledge (SWEBOK)
  This standard characterizes the boundaries of the software engineering discipline and provides topical access to the literature supporting that discipline. This is interesting as it is a standard that has a direct link to an existing Body of Knowledge.

Standards of general relevance to ICT

• ISO 9001:2015 Quality management systems – Requirements
  This standard specifies requirements for a quality management system when an organization:
  • needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and
  • aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.
  It also includes, which is new for this latest version a new clause, 7.1.6, on organizational knowledge and its management.

Relevant bodies of knowledge

• Enterprise Information Technology Body of Knowledge (EITBOK).
  This has been developed by IEEE and ACM (http://eitbokwiki.org/Main_Page)It has fourteen chapters organised under two main sections, the Enterprise Perspective and the Life Cycle perspective. Each chapter is linked to the relevant sections of the e-CF and other frameworks including SFIA and IT-CMF.
Part 1: The Enterprise Perspective
1. Enterprise Architecture
2. Strategy and Governance
3. Change Initiatives
4. Interoperability
5. Security
6. Quality
7. Disaster Preparedness
8. Operations and Support
9. Ethics

Part 2. The Life Cycle Perspective
10. Requirements
11. Acquisition
12. Construction
13. Transition into Operation
14. Maintenance and Control

3.1.1. ESCO
ESCO is an important European Commission sponsored EU-initiative that provides a multilingual classification of European Skills, Competences, Qualifications and Occupations. The ESCO classification identifies and categorises skills, competences, qualifications and occupations relevant for the EU labour market and education and training. It systematically shows the relationships between the different concepts. ESCO is designed to facilitate job searching and job matching and in addition it can play a significant role in career management and labour market analysis Europe-wide.

In relation to European ICT Professional it is important to recognise that ESCO encompasses the vast array of occupations prevalent across the EU, a much wider scope than ICT profiles, and it is elaborated at a much higher level of granularity in job profiles identification.

However, it is logical and useful that although the two constructs differ in scope and application there must be a consistent and understandable relationship between them. Cooperation between the ESCO project development team and the EU ICT professional profiles team has enabled constructive discussions which support the creation of a “linking table” that will support cross-reference between the two structures. Taking into account the granularity of the components within each structure, the occupation table within ESCO identifying 118 ICT occupational profiles is being used as a reference point to connect to the generation 2 profiles of the updated European ICT Professional Profiles expected to consist of ca. 27 ICT role profiles in total. In this way both structures will not only relate to each other but each will add value to the other.

3.2. Results from EU ICT multi-stakeholder community on-line consultation for the profiles update
To collect additional input on practical use and improvement potential of the European ICT Professional Profiles CWA 16458, the stakeholder on-line survey ran from 24th of February until 20th of April 2017. Some survey outcomes are still under evaluation but the team is already confident that they provide valuable input for the European ICT Professional Profiles update.
3.2.1. Overview on survey participation and statistics

The "European ICT Professional Profiles" user feedback survey provided a very important opportunity to get realistic and detailed insight on current use of ICT Profiles in practice.

The main aim was to collect qualified technical feedback from stakeholders and experts familiar with the CWA first release and with understanding of the overall profile structure and look from a practical application standpoint. Their collective input will inform the forthcoming update and provide guidance based upon expert experience of current market and technical trends.

Official launch of the survey through a dissemination message from the project leader, was supported and redistributed by a series of interested stakeholders (e.g. (ICS)2, Euro CIO, CIGREF, CEPIS, CRUETIC, IVI) within their networks.

Taking into account the project’s focussed approach (see section 1.2.) i.e. addressing quality over quantity the feedback collected was high quality and fit for purpose.

80 respondents from 11 EU-countries and four additional countries (Belgium, Estonia, France, Germany, Hungary, Ireland, Italy, Malta, Netherlands, Spain, UK and Ukraine, Canada, Malaysia, Japan) reported on their factual ICT profiles knowledge, application experiences, enhancement suggestions, etc.

The organisation characteristics of respondents were well balanced to ensure collection of feedback from multiple stakeholder perspectives, from ICT supply and demand companies, public sector, universities, other types of qualification and certification providers, sector associations, trade unions, consultancy and research and other types of institutions.

Figure 4: Organisation characteristics of survey respondents

<table>
<thead>
<tr>
<th>Organisation characteristics of survey respondents</th>
<th>Answers</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT supply company</td>
<td>6</td>
<td>7.5%</td>
</tr>
<tr>
<td>ICT demand company (e.g. finance, trade, logistics... )</td>
<td>5</td>
<td>6.25%</td>
</tr>
<tr>
<td>public sector</td>
<td>19</td>
<td>23.75%</td>
</tr>
<tr>
<td>ICT qualification provider</td>
<td>6</td>
<td>7.5%</td>
</tr>
<tr>
<td>sector association</td>
<td>7</td>
<td>8.75%</td>
</tr>
<tr>
<td>trade union</td>
<td>1</td>
<td>1.25%</td>
</tr>
<tr>
<td>consultancy and research</td>
<td>14</td>
<td>17.5%</td>
</tr>
<tr>
<td>replying as individual</td>
<td>3</td>
<td>3.75%</td>
</tr>
<tr>
<td>other</td>
<td>11</td>
<td>13.75%</td>
</tr>
<tr>
<td>No Answer</td>
<td>8</td>
<td>10%</td>
</tr>
</tbody>
</table>

Representation of stakeholders operating in a regional, national, European or international/ global context was equally well balanced.
Figure 5: Answers to question “Across which geography does your organisation operate?”

<table>
<thead>
<tr>
<th>Geography</th>
<th>Answers</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional</td>
<td>8</td>
<td>10 %</td>
</tr>
<tr>
<td>National</td>
<td>25</td>
<td>31.25 %</td>
</tr>
<tr>
<td>European</td>
<td>10</td>
<td>12.5 %</td>
</tr>
<tr>
<td>International/global</td>
<td>29</td>
<td>36.25 %</td>
</tr>
<tr>
<td>No Answer</td>
<td>8</td>
<td>10 %</td>
</tr>
</tbody>
</table>

The following figure 6 shows that the envisaged survey key target stakeholder group, familiar with the European ICT Professional Profiles concept, was reached.

Figure 6: Answers to question “How familiar are you with the European ICT Professional Profiles?”

<table>
<thead>
<tr>
<th>Familiarity</th>
<th>Answers</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have been following with interest ICT Professional development activities since 2010.</td>
<td>25</td>
<td>31.25 %</td>
</tr>
<tr>
<td>I have learnt about its existence years ago.</td>
<td>25</td>
<td>31.25 %</td>
</tr>
<tr>
<td>I have recently learnt about its existence.</td>
<td>13</td>
<td>16.25 %</td>
</tr>
<tr>
<td>I was involved in the ICT profiles creation process.</td>
<td>11</td>
<td>13.75 %</td>
</tr>
<tr>
<td>No Answer</td>
<td>9</td>
<td>11.25 %</td>
</tr>
</tbody>
</table>

81.25 % of respondents indicated that they are actively using the profiles (51.25%) or intending to do so in the future (30%).

Figure 7: Answers to question: “Are you using or intending to use the profiles?”

<table>
<thead>
<tr>
<th>Intention</th>
<th>Answers</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, I am using them.</td>
<td>41</td>
<td>51.25 %</td>
</tr>
<tr>
<td>I am not using them but intend to do so in the future.</td>
<td>24</td>
<td>30 %</td>
</tr>
<tr>
<td>I have tried to use them but found it challenging.</td>
<td>3</td>
<td>3.75 %</td>
</tr>
<tr>
<td>No, I have no intention to apply the profiles.</td>
<td>1</td>
<td>1.25 %</td>
</tr>
<tr>
<td>No Answer</td>
<td>11</td>
<td>13.75 %</td>
</tr>
</tbody>
</table>
Answers collected regarding ICT Profile applications demonstrated that the first ICT Profiles CWA has reached its primary goal i.e. multiple applicability by a broad variety of stakeholders using a common language and participating in a convergence of terminology for ICT professional development.

Figure 8: Answers to question “If you are using the profiles, please indicate for what purposes?”

<table>
<thead>
<tr>
<th>Answers</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR planning and development</td>
<td>23</td>
</tr>
<tr>
<td>qualification and certification promotion</td>
<td>34</td>
</tr>
<tr>
<td>hiring</td>
<td>12</td>
</tr>
<tr>
<td>job description</td>
<td>39</td>
</tr>
<tr>
<td>job evaluation</td>
<td>25</td>
</tr>
<tr>
<td>individual assessment</td>
<td>33</td>
</tr>
<tr>
<td>curricula development</td>
<td>20</td>
</tr>
<tr>
<td>personal career development</td>
<td>27</td>
</tr>
<tr>
<td>market research</td>
<td>6</td>
</tr>
<tr>
<td>e-Skills strategy development</td>
<td>26</td>
</tr>
<tr>
<td>supply chain integration and procurement processes</td>
<td>1</td>
</tr>
<tr>
<td>profile building</td>
<td>31</td>
</tr>
<tr>
<td>connecting own frameworks/ concepts/products to the EU level</td>
<td>22</td>
</tr>
<tr>
<td>other</td>
<td>7</td>
</tr>
<tr>
<td>No Answer</td>
<td>10</td>
</tr>
</tbody>
</table>

The construction methodology of EU ICT profiles encourages two basic types of application: 1. using the profiles as a reference as they are described in the CWA, or 2. adapting them to a specific context and using them as a template to create more detailed generation three profiles. Feedback indicated that stakeholders are comfortable in using them in either way.
84% of respondents stated that the 23 ICT Professional Profiles are useful or very useful for their work.

The detailed statistical overview of the „European ICT Professional Profiles” on-line survey results can be found in Annex 1 of this report.

3.3. Technical proposals informing the ICT Profiles CWA update – main trends

Feedback gained from technical experts and stakeholder meetings including ICT Profiles user feedback workshop, systematic analysis of the on-line survey results and outcomes of the first investigation phase on other relevant European e-Skills initiatives (see section 3.1.) have highlighted the following main trends for consideration.

• **Information Security** is an increasing challenge that threatens all communities benefiting from use of the Internet. Governments, public sector, business and individual users require protection and reassurance that their data is safe. The implication for the ICT profession is that all ICT professionals must address these growing threats, not only highly specialised software engineers. It is recognised that security must be imbedded in all IT processes and developments and the responsibility for preventative measures is a cross cutting issue for all ICT professional roles. Consequently all existing and any new Professional Profiles will be examined and if necessary amended to take into account this on-going threat.

• ‘**Agile’ working methods** are increasingly deployed for ICT developments. This methodology is used especially for software development, and is characterized by the division of tasks into short phases of work and frequent reassessment and adaptation of plans. The ‘Agile’ iterative approach grows in popularity because of its productivity benefits and improved speed of implementation. The nature of this change in process gives rise to modified behaviour of IT...
professionals and in some cases restructures individual job content. As this is a pervasive process it has implications for the role characteristics of some existing profiles and also potentially for the construction of new roles.

- **Data and Big data**: IBM states that, each day, 2.5 quintillion new bytes of data are created around the world\(^8\). Awareness of the value of data and the need to manage it is driving a requirement for more expertise in this area, often referred to as data science. Big Data, a term used to describe extremely large data sets, illustrates the challenges encountered to capture, store, analyse, search, share, transfer, visualise, query, update and protect vast quantities of information. As experience and knowledge grows about the management of this vast pool of data, so does the growth in instruments to address it and this drives an increasing demand for data specialists to deploy these innovative tools. New roles and jobs are being created with titles such as Data Modeller, Data Visualisation specialist, Research specialist and many more. EU Professional Profiles will address this trend potentially through the creation of new profile(s) and/or modifications to existing profiles.

- **Digital Transformation** embeds a profound and accelerating transformation of business activities, processes, competences and models to fully leverage the changes and opportunities of digital technologies.\(^9\) The understanding that paradigm-disrupting technology can revolutionise an organisation has kindled interest in new approaches to reinventing an enterprise. Furthermore it is increasingly understood that effective transformation needs to be driven at both strategic and operational levels. This trend raises the requirement for new and/or adapted human competences that are incorporated within changing job roles often accompanied by revised titles (sometimes only fully recognised internally within the organisation). The EU Professional Profiles will take this job role direction into account and reflect it in the CWA update.

- In addition to the above highlighted topics, feedback emphasised the continuing importance of **cloud computing** which will influence the update of existing profiles and the ever present requirement to enhance **end user experience** of services and applications. In recognition of this trend direction (UX) a new profile entitled, Solution Designer, has been drafted and is subject to expert peer review.

### 3.4. Structured feedback mechanism informing the profiles update

To support efficient ICT Profiles update a structured feedback mechanism was designed, providing clear orientation and guidance to all stakeholders about the technical and organisational aspects of the ICT Profiles maintenance. This template may be used as a compass for future updating cycles, to be adapted in detail to the applying organisational context of the update.

**Table 8: Structured feedback process applied in this project for ICT Profiles maintenance**

<table>
<thead>
<tr>
<th>Month</th>
<th>Step</th>
<th>Players involved</th>
<th>Output expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-04/2017</td>
<td>1 – On-line survey</td>
<td>CEN ICT Profiles expert team leader</td>
<td>Technical feedback from ICT Profiles user community, EU and abroad</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ICT profiles user community</td>
<td></td>
</tr>
</tbody>
</table>

\(^8\) IBM Grow your own citizen data scientists with these 5 tips

\(^9\) https://www.i-scoop.eu/digital-transformation/
<table>
<thead>
<tr>
<th>Month</th>
<th>Step</th>
<th>Players involved</th>
<th>Output expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/2017</td>
<td>2 – Feedback workshop with known ICT Profiles users</td>
<td>CEN nominated ICT Profiles expert team</td>
<td>Technical feedback on existing current ICT Profiles version from experienced ICT Profiles users</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Invited participants of ICT Profiles user community</td>
<td></td>
</tr>
<tr>
<td>05-07/2017</td>
<td>3 – Structuring of all comments received by steps 1-2</td>
<td>CEN nominated ICT Profiles expert team</td>
<td>All input from steps 1-3 structured for consideration for Profiles CWA update</td>
</tr>
<tr>
<td>05-10/2017</td>
<td>4 – Consideration of all comments received</td>
<td>CEN nominated ICT Profiles expert team</td>
<td>ICT Profiles new version update draft v1</td>
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<td></td>
<td></td>
<td>Supporting expert workgroup</td>
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<tr>
<td>12/2017</td>
<td>5 – Proposal and discussion of first draft version with CEN ICT Skills Workshop</td>
<td>CEN nominated ICT Profiles expert team</td>
<td>Feedback from CEN ICT Skills Workshop on ICT Profiles CWA update draft v1</td>
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<td>CEN ICT Skills Workshop</td>
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<tr>
<td>12/2017</td>
<td>6 - Consideration of all feedback received</td>
<td>CEN nominated ICT Profiles expert team</td>
<td>“European ICT Professional Profiles” CWA update draft v2</td>
</tr>
<tr>
<td>01/2018</td>
<td>7 – open technical session for final improvements</td>
<td>CEN nominated ICT Profiles expert team</td>
<td>Feedback from EU ICT Stakeholder Community on ICT Profiles CWA update draft v2</td>
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<tr>
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<td></td>
<td>Interested ICT Skills stakeholders</td>
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</tr>
<tr>
<td>01-02/2018</td>
<td>8 - Consideration of all feedback received</td>
<td>CEN nominated ICT Profiles expert team</td>
<td>“European ICT Professional Profiles” CWA draft for public commenting</td>
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<tr>
<td>02-04/2018</td>
<td>9 – Public commenting</td>
<td>CEN</td>
<td>Public comments on ICT Profiles new version draft</td>
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<tr>
<td>04/2018</td>
<td>10 – Consideration of possible comments received</td>
<td>CEN nominated ICT Profiles expert team</td>
<td>ICT Profiles new version for voting</td>
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<tr>
<td>04/2018</td>
<td>9 – Voting process</td>
<td>CEN Workshop Secretariat</td>
<td>Voting result</td>
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<td></td>
<td></td>
<td>CEN ICT Skills Workshop paying members</td>
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<tr>
<td>04/2018</td>
<td>10 – CWA new version approval and publication</td>
<td>CEN Workshop Secretariat</td>
<td>New ICT Profiles version published as CWA</td>
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<td></td>
<td></td>
<td>CEN Workshop Management</td>
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</table>

Taking into account the required stability in profile descriptions and the balance with ICT business developments, it is recommended to consider publication of new ICT Profiles versions, deploying the above process to develop an update, every three years.
3.5. Case studies development: stakeholder perspectives and first input identified

Based upon the ICT Profile application experiences of stakeholders reported in the on-line survey, the expert team is developing case studies based upon this valuable user knowledge. The main goal is to make this guidance practical and illustrative to provide inspiration and guidance to current and future framework users.

For now, the following key perspectives that will inform the case study format are highlighted:

A. ICT professional assessment & career development
B. Curricula development in university environment
C. ICT Profiles use in SME environment
D. HR planning in larger companies and/or spotlight: Security
E. Generation 3 developments by sector associations
F. ICT Profiles use by Certification institutes
G. Implementation of the ICT Profiles for use in the public Sector

Within the case study template, the following main aspects are proposed:

a. Title: target group and application perspectives/ ways of usage
b. Summary
c. Context of ICT Profiles use
d. Benefit/ value added
e. Effective ways of overcoming challenges
f. Method applied

The work is progressing on time. A draft of all case studies, consolidated by the technical expert team based upon contributing stakeholder experiences will be available for discussion for the CEN ICT Skills Workshop in January 2018. Final versions are planned for publication in April 2018.

4. Outlook at the further project work

This interim report provides the half time milestone of the “European ICT Professional Profiles in action” project work. It provides a basis to reinforce stakeholder discussions on the interim outcomes achieved and to further outline the project work on deliverables planned over the coming months.

The main areas of work will be as follows:

• ICT Profiles update and CWA Part 1 publication based on the interim results presented in chapter 3 – final result planned for April 2018
• User guide development and CWA Part 2 publication based on the interim results presented in chapter 3 – final result planned for April 2018
• Methodology documentation development and CWA Part 3 publication based on the interim results presented in chapter 3 – final result planned for April 2018
• Case studies development and CWA Part 4 publication based on the interim results presented in chapter 3 – final result planned for April 2018

Taking the interim results presented in this report for further discussion and development in the context of the CEN ICT Skills Workshop Community and by further interested sector players, all expected deliverables will be developed, discussed and further improved within the multi-stakeholder context of the project. These actions will provide a consistent and widely accepted final outcome, a European ICT Professional Profiles second release connected to other relevant concepts in the field of European ICT Professionalism with complementary application and communication support materials by April 2018.
5. Glossary (work in progress)

**IMPORTANT NOTE:** The following specifications reflect the current project technical state of discussion. The detailed final text will need further stakeholder agreement and careful crafting to alignment with other EU common terminology.

<table>
<thead>
<tr>
<th>TERM</th>
<th>DEFINITION</th>
<th>SOURCE</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>competence</td>
<td>Demonstrated ability to apply knowledge, skills and attitudes to achieve observable results</td>
<td>EN 16234-1</td>
<td>Competences defined by EN 16234-1 European e-Competence Framework (e-CF)</td>
</tr>
<tr>
<td>job</td>
<td>A paid position of regular employment</td>
<td>Oxford English dictionary</td>
<td></td>
</tr>
<tr>
<td>Job description</td>
<td>(in progress) is a detailed description of what a person does so that the particular job holder can have no doubt of their duties and responsibilities. It contains detailed information about competences, skills and knowledge required. It is a sign of a mature organisation that people do their jobs with an eye on how it contributes to their role in the organisation.</td>
<td>ESCO profiles</td>
<td></td>
</tr>
<tr>
<td>knowledge</td>
<td>Body of facts, principles, theories and practices that is related to a field of work or study</td>
<td>European Qualifications Framework (EQF), also adopted by EN 16234-1</td>
<td>knowledge examples provided by EN 16234-1 European e-Competence Framework (e-CF)</td>
</tr>
<tr>
<td>role</td>
<td>A role is a set of responsibilities, activities and authorities granted to a person or team. A Role is defined in a Process. One person or team may have multiple roles.</td>
<td>ITSM Academy</td>
<td></td>
</tr>
<tr>
<td>role profile</td>
<td>simple documents which demonstrate clearly the relationship between specific activities/tasks and the personal attributes required to undertake them.</td>
<td>Creative Leadership – Talent Management</td>
<td>ICT Profiles CWA draft, discussion in progress</td>
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</tbody>
</table>
skill | ability to apply knowledge and use know-how to complete tasks and solve problems, from managerial to technical | European Qualifications Framework (EQF), also adopted by EN 16234-1 | Skills examples provided by EN 16234-1 European e-Competence Framework (e-CF)

6. References


ESCO European Skills, Competences, Qualifications, Occupations available at: https://ec.europa.eu/esco/portal/home


7. Acknowledgements

We are grateful and indebted to the wide group of people and organisations who have contributed to date to the „European ICT professional Profiles in action” project work, including

- the registered CEN ICT Skills Workshop Members who expressed their support, coming from (ISC)2, AICA, ATI-Asociación de Técnicos de Informática, BCS, the Chartered Institute for IT, CEPIS, CIGREF, CompTIA, ECDL Foundation, European e-Skills Association (EeSA), EMF, eXcellence, ESI-CEE, E-SCN, EuroCIO, EXIN, HBO-I, IVI- Innovation Value Institute, IT Staffing, Internatinal Webmasters’ association (IWA) Italy, Linux Professional Institute, Microsoft, Pasc@line, Thames Communication, Trinity College Dublin

- ICT Profiles on-line survey respondents, coming a.o. from Connect IT People, UILTuCS, Airbus, GAIA (the telecom cluster of the Basque country), e-Jobs Observatory, Bl4ckswan, University of Málaga, makeme.guru, Agenzia per l’Italia Digitale, European Association for Technical Communication tekom Europe e.V., BCS Koolitus, KNVI, Capgemini, AppCert, Basque Government, QIS Qualification of Information Security Professionals, IT-Cl, Netmind, Capgemini Academy, KNVI, EPI, Randstad Italia SpA, Cefriel, Meath County Council, Assinter Italia, Certipass

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- the CEN ICT Workshop Community, including not-registered members,

and further European e-skills and ICT Professionalism stakeholders for providing highly valuable input and support.