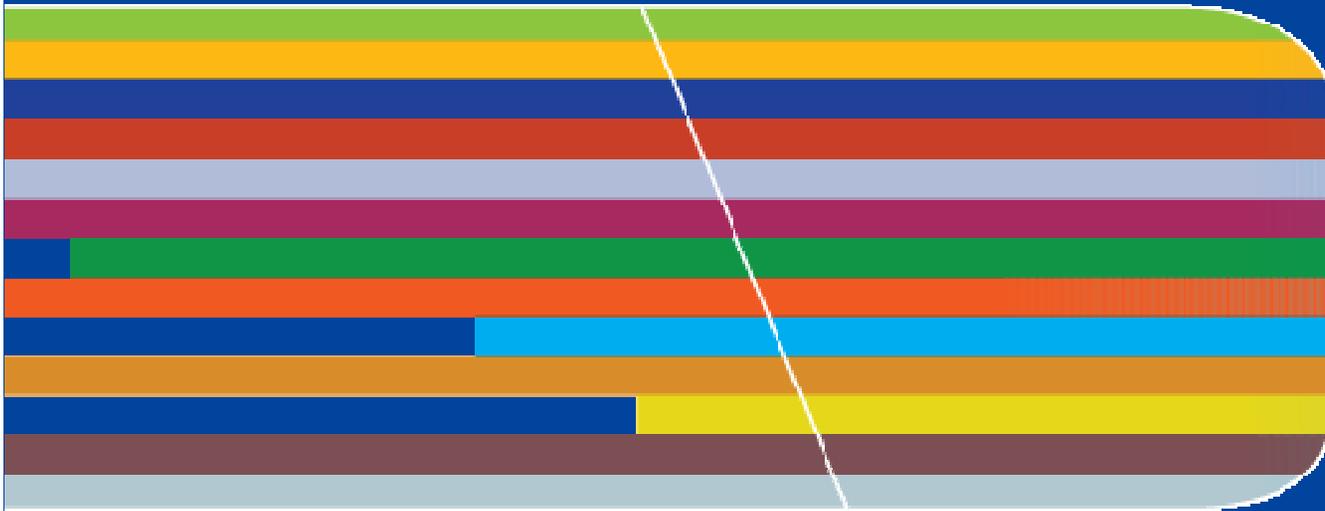# European e-Competence Framework
for the ICT Sector

Dudley Dolan

The Context

Context

Professionalism

The Challenge

- Growth of ICT

- Pervasive ICT

- Internet of Things (IoT)

- Education

- Business

- The growing need for people with ICT Skills

The Challenge

- ICT is immature compared to other professions

- Is there an ICT Profession?

- Poor public perception of ICT education, jobs and careers

- Insufficient people entering ICT education and careers

- Disturbing rate of ICT project failures

The Challenge

- Professions have formed when failure to apply domain specific knowledge successfully had a potentially adverse effect on society

- New wave of ever more pervasive computing will mean that the extent to which ICT is embedded in society will grow

- Failure to mature the ICT profession may create risks which grow to unacceptable levels
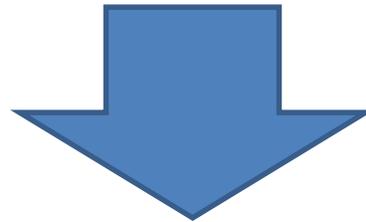
CEN CENELEC

The Challenge

- Vince Cerf one of the founding fathers of the Internet wrote;

- "It is difficult to believe the software profession will escape some kind of accountability in the future"

- (Cerf, 2013)

We all need skills

- *Molnar, 1978*
  - "In an Information Society, a computer literate populace is as important as energy and raw materials are to an industrial society"

Accenture, 2014

  - "Every business is a digital business, every worker is a knowledge worker"

European Framework for ICT Professionalism

- European e-Competence Framework and ICT Jobs Profiles

- European Foundational ICT Body of Knowledge and Curriculum Development Guidelines

- Quality Label for ICT Industry Training and Certification

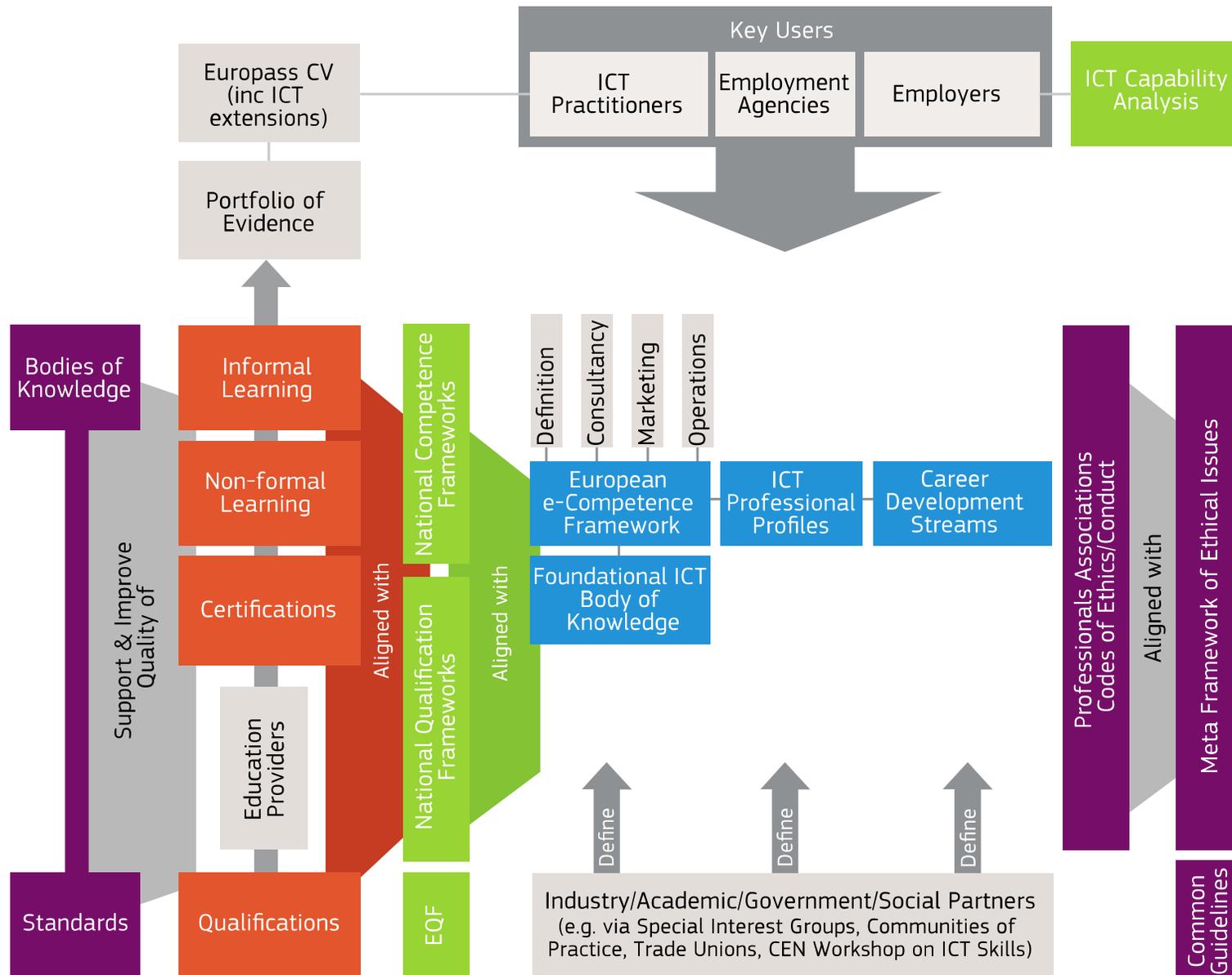- Professional Code of Ethics

Key components of a profession

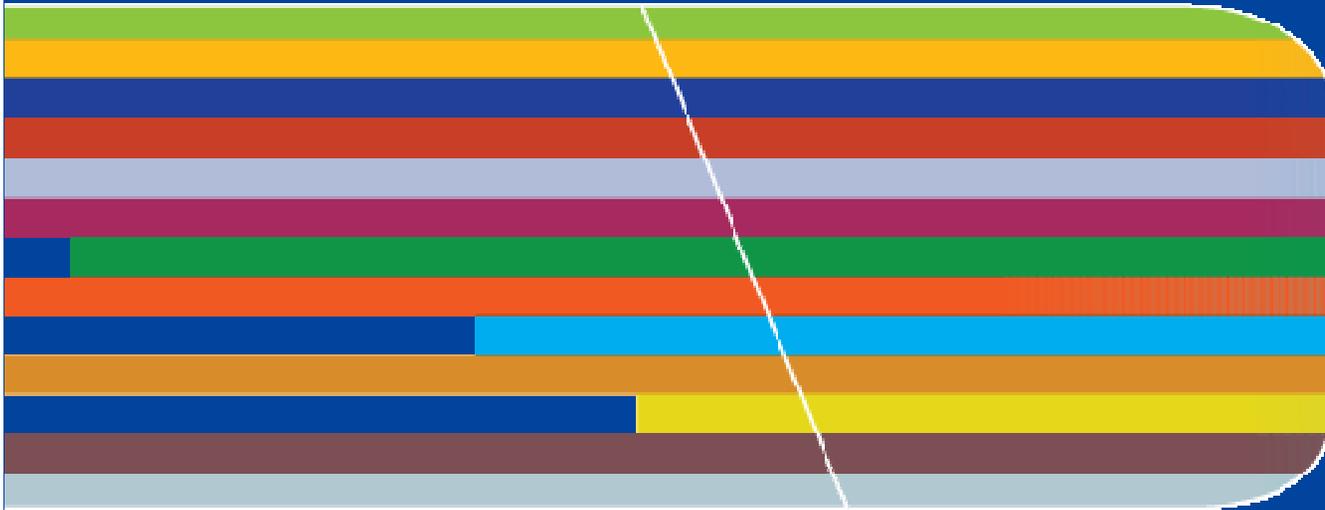|	
Competences	Education and Training
Professional Ethics	Bodies of Knowledge

Framework overview

Key Users

ICT Practitioners | Employment Agencies | Employers

ICT Capability Analysis

Europass CV (inc ICT extensions)

Portfolio of Evidence

Bodies of Knowledge

Informal Learning

Non-formal Learning

Certifications

Education Providers

Support & Improve Quality of

National Competence Frameworks

National Qualification Frameworks

Aligned with

Aligned with

Definition | Consultancy | Marketing | Operations

European e-Competence Framework

ICT Professional Profiles

Career Development Streams

Foundational ICT Body of Knowledge

Professionals Associations Codes of Ethics/Conduct

Aligned with

Meta Framework of Ethical Issues

Standards

Qualifications

EQF

Industry/Academic/Government/Social Partners
(e.g. via Special Interest Groups, Communities of Practice, Trade Unions, CEN Workshop on ICT Skills)

Define

Define

Define

Common Guidelines

European e-Competence Framework

Dudley Dolan

CEN Workshop on ICT Skills activities

- Founded in 2003
- Support European Commission policy for eSkills
- Skills standards
- Certification standards
- ICT Professionals
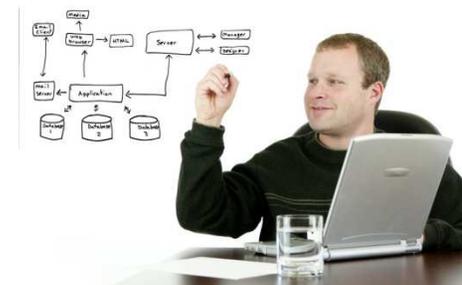- Job Profiles

CEN Workshop on ICT Skills activities

"Fostering competitiveness, growth and jobs"

1. ICT user skills

2. e-Business skills
   e-leadership

3. ICT practitioner skills

CEN Workshop on ICT Skills activities

Frameworks

- e-Competence Framework
    - e-CF into SMEs
  - e-Competence Framework for ICT Users
- Job profiles
- Certifications
- Euro Mediterranean Project

CENELEC

The e-Competence Framework

A common pan-European framework for ICT practitioners in all industry sectors; it is a reference framework of 40 ICT competences that can be used by ICT user and supply companies, the public sector, educational and social partners across Europe. The framework provides a **pan-European tool** for:

❑ **ICT practitioners and managers**, with guidelines for competence development

❑ **HR managers**, enabling effective planning of competence requirements

❑ **Education and training**, enabling effective planning and design of ICT curricula

❑ **Policy makers and market researchers**, providing a clear and Europe-wide agreed reference for ICT skills and competences in a long-term perspective

European e-Competence Framework

e-CF 3.0 overview

- 5 e-Competence areas (dimension 1)
- 40 e-Competences (dimension 2)
- 5 proficiency levels (dimension 3)
- knowledge and skills examples (dimension 4)

European e-Competence Framework 3.0 overview

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

A joint effort by ICT industry, training, research and policy makers

e-CF 1.0 framework release (2008)

e-CF 2.0 framework update (2010)

e-CF 3.0 framework update (2013)

e-CF European Standard planned February 2016

Many contributors from Europe and overseas

ICT and HR management know-how from European ICT business

Education, research, training and certification providers

Policy makers and e-Skills stakeholders

A joint effort by ICT industry, training, research and policy makers

Contributors/ examples: Deutsche Telekom, Bayer Business Services, CIGREF, PSA Peugeot Citroen, EuroCIO, EXIN International, Microsoft, Cisco, IG Metall, EMSI Grenoble, Fondazione Politecnico Milano, e-Skills UK, Cap Gemini, European e-Skills Association, Airbus, Syntec Informatique, AFPA, Bitkom, Banca d'Italia, UK Cabinet Office, CEPIS, ECABO, Michelin, UNI Europa, PIN SME, IPA Japan, …

The European e-Competence Framework is a component of the **long term e-skills agenda (**<u>**e-skills for the 21st Century**</u>**) of the European Union** supported by the European Commission and The Council of Ministers and of the „**Grand Coalition for ICT jobs**"

e-CF Profiling Tool

http://profiletool.ecompetences.eu/

Guiding Principles

The e-CF is an enabler

The e-CF expresses ICT competence

Competence is durable

A competence can be a component of a job role

Competence is not a technology

The e-CF is not exhaustive

The e-CF has a relationship with the EQF

The e-CF is neutral and free to use

Framework underpinning methodology

Based on a shared understanding of competence

> Competence: a demonstrated ability to apply
> knowledge, skills and attitudes for achieving observable results

5 e-Competence levels related to the European Qualifications Framework (EQF)

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

Framework structured in 4 dimensions:

Dimension 1: 5 e-CF areas Dimension 3: 5 e-CF levels

Dimension 2: 40 competences Dimension 4: knowledge & skills examples

e-CF structure and look

The European e-Competence Framework is structured in four dimensions.

These dimensions reflect different levels of business and human resource planning requirements in addition to job work proficiency guidelines and are specified as follows:

e-CF structure and look

Dimension 1:5 e-Competence areas derived from the ICT business processes PLAN – BUILD – RUN – ENABLE – MANAGE

Dimension 2: A set of reference e-Competences for each area with a generic description for each competence. 40 competences identified in total provide the European generic reference definitions of the e-CF 3.0.

e-CF structure and look

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

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

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

European e-Competence Framework

e-CF 3.0 overview

- 5 e-Competence areas (dimension 1)

- 40 e-Competences (dimension 2)

- 5 proficiency levels (dimension 3)

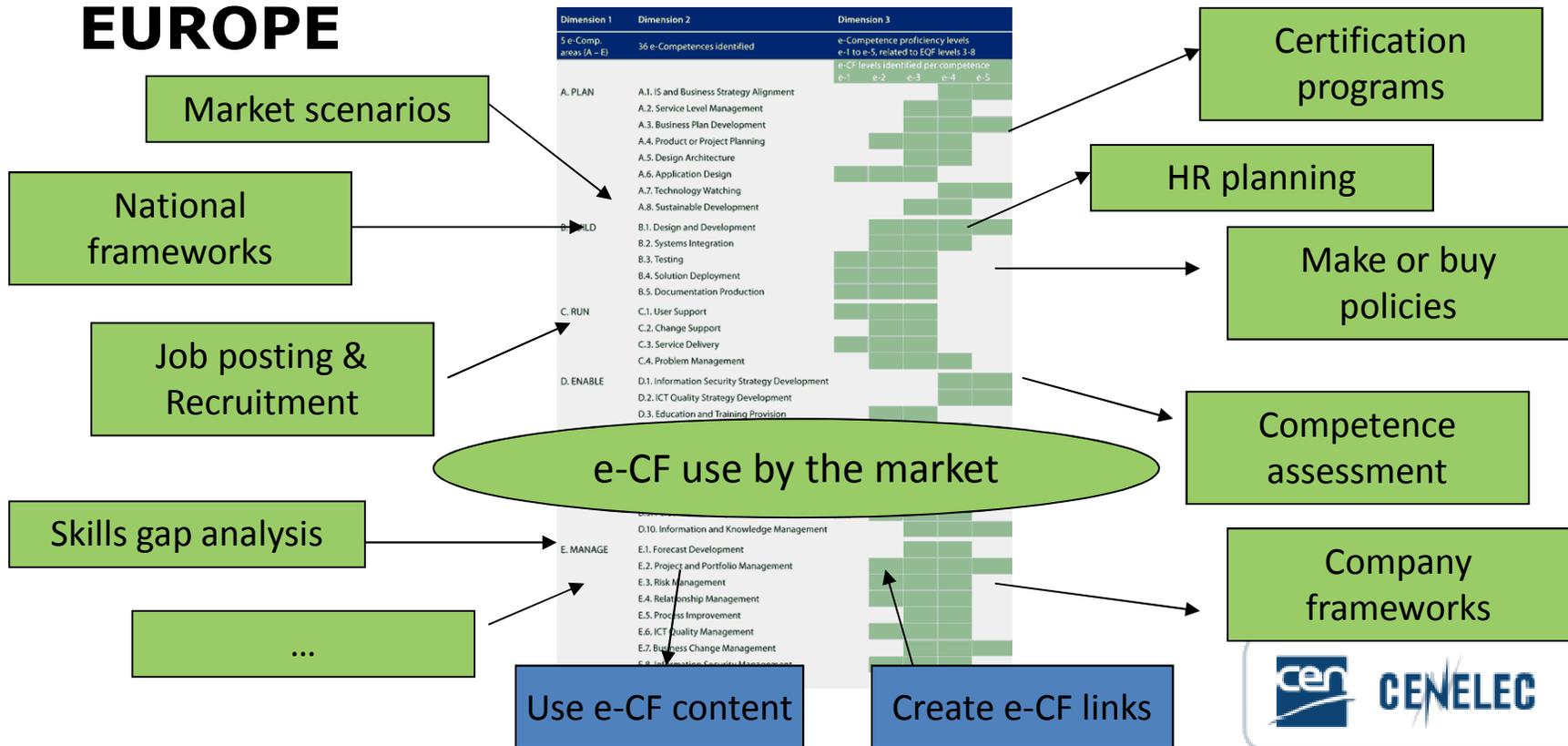- knowledge and skills examples (dimension 4)

Dudley Dolan

European e-Competence Framework 3.0 overview

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

e-CF user feedback

INCREASING TRANSPARENCY, MOBILITY, EFFICIENCY IN ICT HR ISSUES ACROSS EUROPE

Market scenarios

National frameworks

Job posting & Recruitment

Skills gap analysis

...

e-CF use by the market

Certification programs

HR planning

Make or buy policies

Competence assessment

Company frameworks

Use e-CF content

Create e-CF links
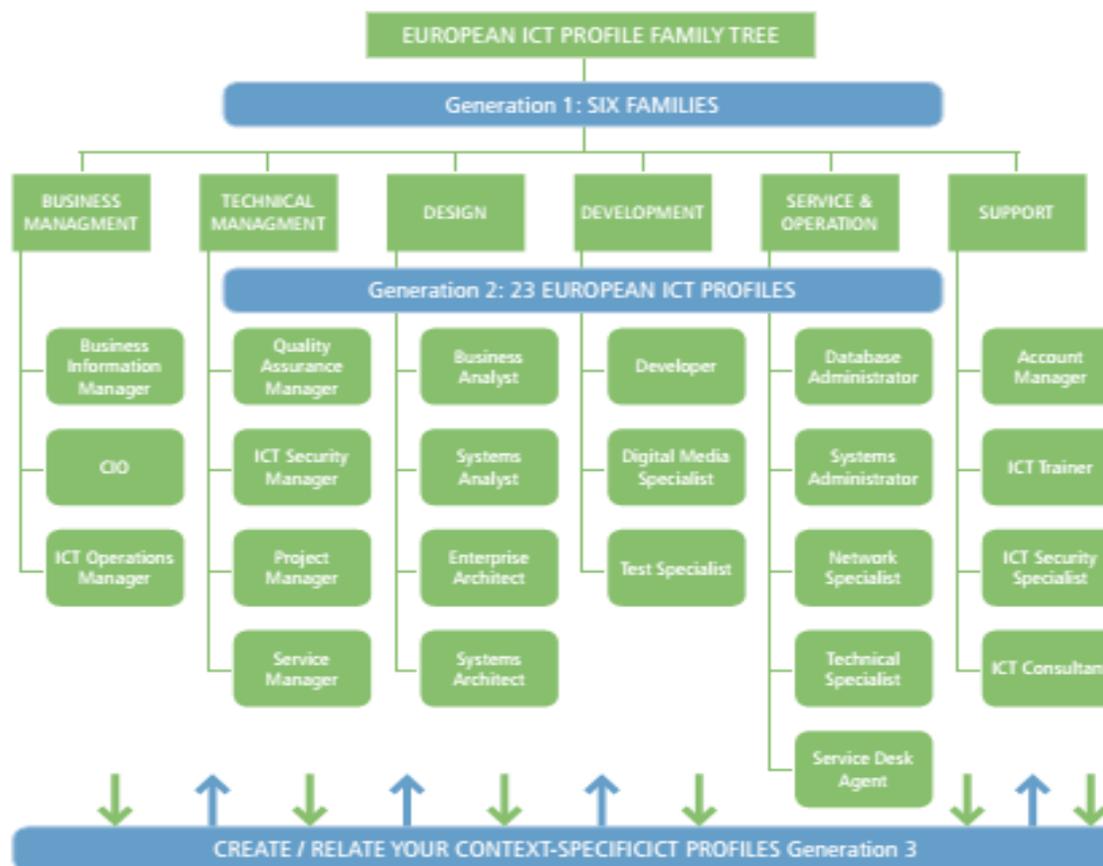
Job Profiles

23 Job Profiles

6 Families

- **Business Management** – with Business Information Manager, Chief Information Officer, ICT Operations Manager

- **Technical Management** – Quality Assurance Manager, ICT Security Manager, Project Manager, Service Manager

- **Design** – Business and Systems Analyst, Enterprise and Systems Architect

- **Development** – Developer, Digital Media Specialist, Test Specialist

- **Service & Operation** – Database and Systems Administrator, Network and Technical Specialist, Service Desk Agent

- **Support** –ICT Consultant, Account Manager, ICT Trainer, ICT Security Specialist.

Job Profiles

EUROPEAN ICT PROFILE FAMILY TREE

Generation 1: SIX FAMILIES

BUSINESS MANAGMENT	TECHNICAL MANAGMENT	DESIGN	DEVELOPMENT	SERVICE & OPERATION	SUPPORT

Generation 2: 23 EUROPEAN ICT PROFILES

Business Information Manager	Quality Assurance Manager	Business Analyst	Developer	Database Administrator	Account Manager
CIO	ICT Security Manager	Systems Analyst	Digital Media Specialist	Systems Administrator	ICT Trainer
ICT Operations Manager	Project Manager	Enterprise Architect	Test Specialist	Network Specialist	ICT Security Specialist
	Service Manager	Systems Architect		Technical Specialist	ICT Consultant
				Service Desk Agent	

CREATE / RELATE YOUR CONTEXT-SPECIFICICT PROFILES Generation 3

www.ecompetences.eu

A common European framework for ICT Professionals in all industry sectors
Welcome to the e-CF

The European e-Competence Framework (e-CF) provides a reference of 40 competences as required and applied at the Information and Communication Technology (ICT) workplace, using a common language for competences, skills and proficiency levels that can be understood across Europe. CEN e-CF 3.0 overview brochure

As the first sector-specific implementation of the European Qualifications Framework (EQF), the e-CF fits for application by ICT service, demand and supply organizations, companies, for managers and HR departments, for education institutions and training bodies, including higher education, for market watchers and policy makers, public and private sectors.
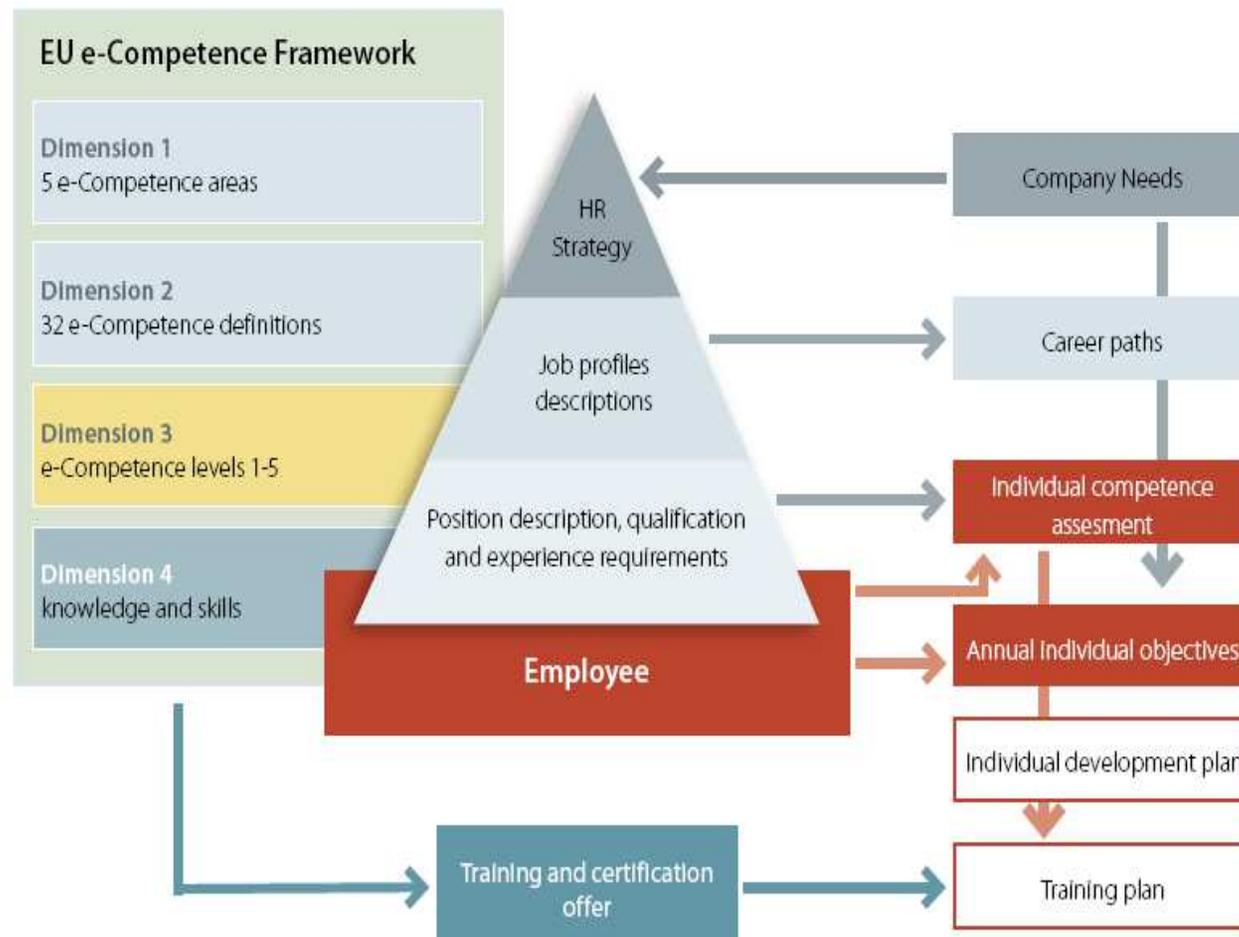
Test it:

Create an e-CF Profile

e-CF 3.0 download
order booklet

# e-CF four dimensions' use example in companies/ ICT organisations

User Guidelines

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

The guide helps:

- To understand the overall context, background and aims of the European e-Competence Framework.

- To understand the main principles and methodological choices underpinning the European e-Competence Framework.

- To enable Information and Communication Technology (ICT) stakeholders – ICT demand and supply companies, the public sector, ICT managers and practitioners, HR developers, ICT job seekers, policy makers, educational institutions and social partners – across Europe, to adopt, apply and use the framework in their environment
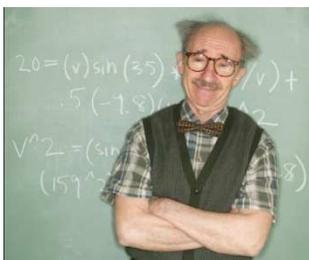
ICT User e-Competence Framework

e-Competence Framework for ICT Users:

An e-competence framework for ICT users is a simplified conceptual structure used to categorise and express ICT user e-competences, to various degrees of granularity, across proficiency level(s).

Dimension 1	Dimension 2	Dimension 3		
ICT User e-Competence Area	ICT User Competence	Proficiency Levels (related to EQF Levels 1-4)		
		Foundation	Intermediate	Advanced
Word Processing	Document Creation			
	Content Organisation			
	Document Collaboration and Interaction			
	Document Automation			
	Document Output and Storage			
Web Browsing and Information Search	Using the Browser			
	Online Search			
	Security			
	Online Awareness			
	Information Assessment			
	Online Services			
	Information Sharing			
Communications	User Configuration			
	Security			
	Information Exchange via e-Mail			
	Contact Creation and Organisation			
	Scheduling			
	Online Collaboration and Social Interaction			
Spreadsheets	Workbooks and Worksheet Creation			
	Formulas and Functions			
	Use and Apply Charts and Graphs			
	Data Analysis and Organisation			
	Spreadsheet Output and Storage			
Presentation	Presentation Creation			
	Content Organisation			
	Use of Graphic and Multimedia Effects			
	Presentation Delivery and Storage			

End user skills – digital literacy

- The computer skills that we need for everyday life and the knowledge necessary to fully interact with the Information Society

To be digitally literate means…

- "To be equipped with the skills to benefit from and participate in the Information Society."

- EU - "Digital literacy involves the confident and critical use of ICT for work, leisure and communication underpinned by basic ICT skills…………"

International experiences

e-CF application by companies, trade unions, qualification & certification providers, policy makers etc. in e.g. Germany, Italy, France, Estonia, Hungary, Bulgaria, Spain, The Netherlands, Canada, Malta and Ireland

Feedback/ application intentions from Sénégal, Turkey, Japan, Egypt, Russia, Morocco, Jordan, Ukraine

Experiences available
http://www.ecompetences.eu/2207,Current+e-CF+users.html

Future

- Agenda compatible with European Commission Policy

- Support from Industry, Academia and Social Partners

- Future work to support ICT Professionalism

- Support work of Project Committee 428 to create a European Standard (EN)

Future

- Fundamental to the development of an ICT Profession

  – Framework, BOK, Ethics, Certifications

- e-CF for different sectors

- **Potential work with ICS to devlop a Health Sector specific version of e-CF**

- Curriculum guidelines

- e-Leadership
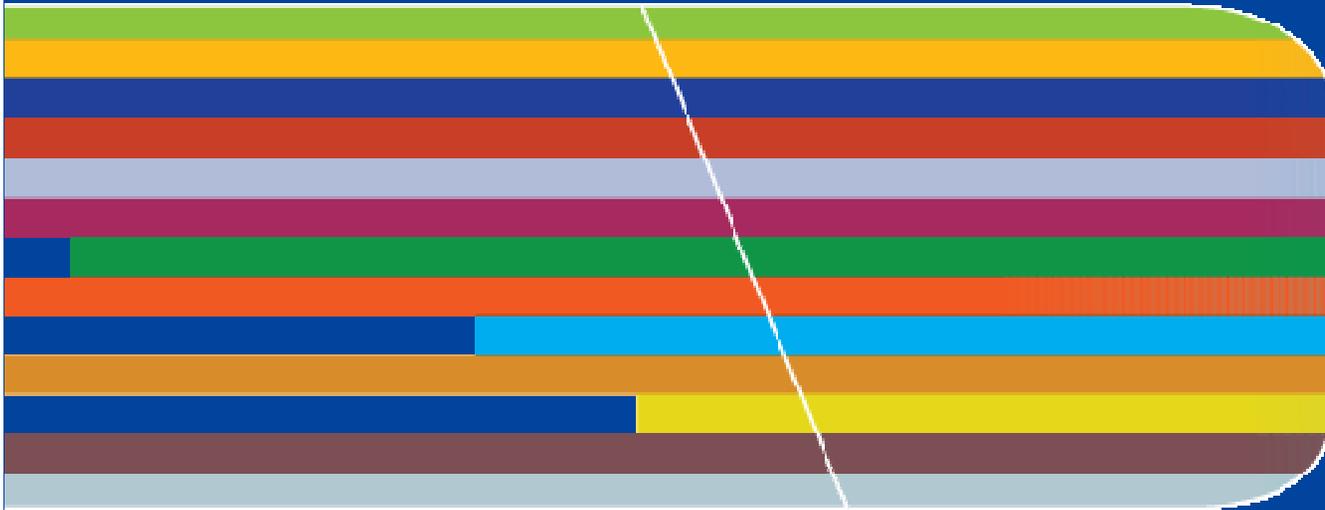
Technical Committee *versus* Workshop

CEN WS ICT SKILLS

About CEN

➢32 National Standardization Bodies:

28 EU countries, 3 EFTA, Croatia,

Turkey

➢6 Associates (consumer,

environmental..)

➢ +/- 60,000 experts, +/- 400

European/international associations

➢Joint CEN-CENELEC Management

Centre in Brussels

The role of CEN

- We provide the platform for stakeholders in a specific area to come together and reach a consensus at European level

- We help to ensure that the system respects the principles of transparency, openness, coherence, consensus,...

The different roles in a CEN TC

Technical Committee/ Project Committee

- Representatives of national standards bodies

- Development of the standard by a working group

- Coordination with national "mirror groups"

NSB (CEN National Standardization Body)

- Provider of the Secretariat for the technical committee *(role: administrative support)*

- Proposer to CEN

The Chair: neutral

Participation in the Technical Committee

National delegations:

- Represent the national position in the TC

- **Voting right**

Associates/European & international organisations in liaison

Observers

Active participation in the work but **without voting right**

EN *versus* CWA

Standard

Voluntary (legislation ≠ standards)

Used in support of legislation/policies

Reflect consensus

Common European reference documents:

✓Implemented as national standards
✓Conflicting national standards are withdrawn

Review: 5 years

CWA

Consensus amongst identified organizations

At least in one of the official languages

Review : 3 years maximum

CEN PC 428

- Proposed by UNINFO Italy
- e-CF adopted by Italy as a National Standard
- First Meeting in 2014
- Development of EN planned for February 2016
- Active participants;
  - Italy
  - Ireland
  - Germany
  - Denmark
  - Netherlands
  - Bulgaria
  - Romania
  - Spain

Conclusion

Dudley Dolan

Chairman

CEN Workshop on ICT Skills

www.ecompetences.eu

dudley.dolan@cepis.org