

Challenging the IT University Education and Innovations in Bulgaria:

Introducing Management Aspects of Software for IT Graduates

ECSS 2011, 7-9 November, Milan

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Faculty of Mathematics
and Informatics

SEMP: SOFTWARE ENGINEERING MANAGEMENT PROGRAM



In partnership with



Software Engineering Institute

Carnegie Mellon



Sofia University "St. Kliment Ohridski"

- 25K Students
- 2,5K staff
- 15 faculties, departments





The Faculty of Mathematics and Informatics (FMI)

inheritor of the former Physics-Mathematical Department founded in 1889.

1904 the Department was renamed to Physics-Mathematical Faculty

1963 it was separated as an independent faculty at the Sofia University

1986 it exists as a Faculty of Mathematics and Informatics

FMI Sofia University

FMI is responsible for teaching and research in the fields of **Informatics, Computer Science, Information Technologies, Software Engineering, Mathematics, Applied and Industrial Mathematics,**

- 2500+ students and postgraduates, 63 PhD students (2011)
- full-time lecturers incl. 70 professors and associate professors and 80+ assistant professors
- Research and Development Labs

Faculty of Mathematics and Informatics

15 departments

- Computer science departments – 4
 - Computing Systems (Computer Science)
 - Information Systems
 - Software Engineering
 - Computer Informatics
- Classical mathematics departments - 7
- Mathematics and applications - 4

Education and Research

Bachelor programs – 8 (> 2K students)

- Informatics, Computer Science, Information Systems, Software Engineering
- Mathematics, statistics, applied mathematics

Master Programs – 26 (> 500 students)

- Computer Science - 15
- Mathematics and Informatics – 2 (school teachers)
- Pure Mathematics - 4
- Applied Mathematics – 5

PhD School – 63 PhD Students (2010 – 11)

PHD School

<http://e-PhD.uni-sofia.bg>

The screenshot displays the website for the e-PhD Doctoral School at Sofia University "St. Kliment Ohridski". The header includes a navigation menu with icons for 'НАЧАЛО' (Home), 'ЗА НАС' (About Us), 'ЗА ПРОСТА' (For Pros), 'НОВИНИ' (News), 'ОБУЧЕНИЕ' (Education), and 'КОНТАКТИ' (Contacts). The main content area features a large image of the university's main building. On the left, there are four vertical buttons: 'ДОКТОРАНТСКО УЧИЛИЩЕ' (Doctoral School), 'ОБУЧЕНИЕ НА СПЕЦИАЛИЗАНТИ' (Specialized Education), 'СПИСАНИЕ ЗА ДОКТОРАНТИ' (Journal for Doctoral Students), and 'ФОРУМ' (Forum). Below these are sections for 'МЕДИА' (Media) and 'ВЪЗПИ ВЪЗПИ' (Education). The bottom right contains two news sections: 'АКТУАЛНИ НОВИНИ' (Current News) with a post from 17.03.2010 about a meeting and a post from 11.12.2009 about electronic education, and 'ПРЕДСТОЯЩИ СЪБИТИЯ' (Upcoming Events) with a post about a course in the summer semester.



Educational And Research Centers and Labs

Center of Technologies of Information Society

3D Simulation and Business Processes Competence Center

- KIT University of Karlsruhe
- BlueGene Supercomputer

Bulgaria Korean IT Cooperation Center

- E-government, semantic web, historical heritage

University eLearning center for research and education in eLearning, distance learning, longlife learning



Partnership Agreements and Collaboration

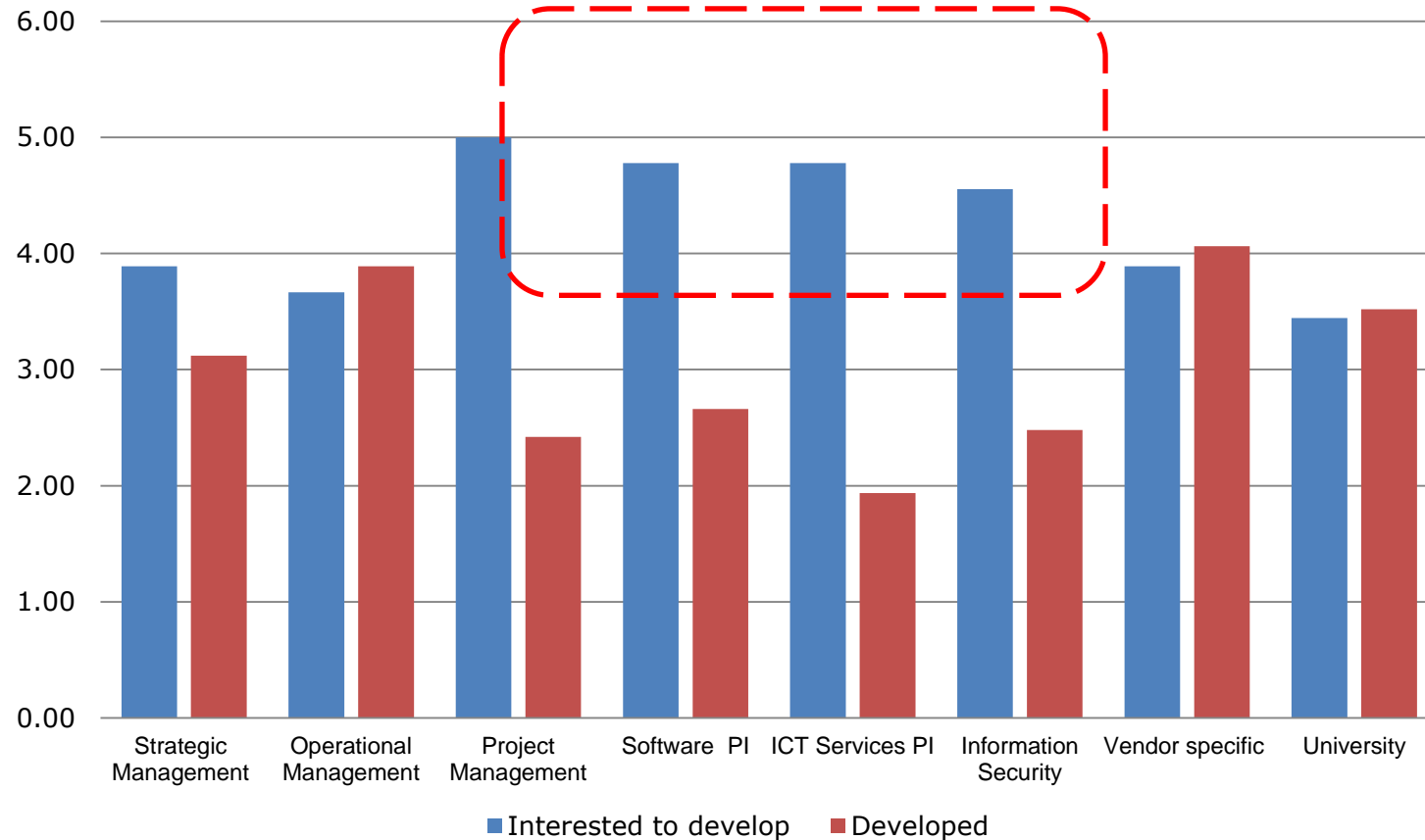


Needs to be Addressed

- Lack of systematic content and practice in lecturing “**management**” subjects for graduate high education courses (bachelors and masters)
- Bridging “**research**” to “**industry**”
- Need for **internationally recognized** and **contemporary qualification position** (master degree) in ICT engineering and management
- **Innovations** management deficit – demand for and readiness to absorb effective stimulation environment and research schools in challenging **areas of ICT**

Major Competence Gaps

Survey for South-Eastern Europe (8 countries, RCI/USAID)





USAID
FROM THE AMERICAN PEOPLE

ESI European Software Institute
Eastern Europe


AMERICA FOR BULGARIA
FOUNDATION
Фондация Америка за България

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Challenging the IT education and qualification in Bulgaria

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TU - СОФИЯ



American University in Bulgaria



Георгиевски Център



With the support of:



ICT Cluster
BULGARIA



РЕПУБЛИКА БЪЛГАРИЯ
Министерство на образованието, младежта и науката

SEMP Objectives

- Increase IT industry competitiveness
- Modernize IT education through specialized IT management components in 3 areas:
 - Engineering/Technology
 - Processes & Organization Management
 - Business
- Validated by industry profiles
(e.g. team/project/product managers for CMMI ML2 organizations)
- Change style of teaching in BG, adopt the “student centric approach”

SEMP Core Areas

Academic format

Executive (intensive) format

Enabling Technology (engineering)	Management (internal processes)	Business
Deciding What to Design (Methods) Requirements Engineering	Organizational (Process) Management: SPI, CMMI (DEV, SVC)	Strategic management (BSC) Business Insight in a Digitized World
Software Architectures	Team/Personal Process Management (TSP/PSP) People CMM Agile+CMMI	Economic Analysis / Financial Accounting / Markets & Sales ICT law BI
Advanced: Secure coding Cloud computing, Virtualization, etc	Quantitative PM Six-sigma Statistics for IT Managers	Negotiation/soft skills Communication for IT managers

Are we aligned with the modern trends?



Prof. Mehdi Jazayeri (University of Lugano) – ECSS 2011 Workshop

T-t-T & Qualification Paths

- Academic courses transfers (CMU, ISR): 4-6 (2 completed, in pilot phase)
- Professional courses (CMU, SEI) – transfer + academic adaptation: 8 (5 completed, piloting)
- Augmented/improved or developed local courses: 6-8 (piloting, “mentored” by ESI, SEI, CMU)

Methodology:

- Student centric approach
- Sync content, terminology (world standard), cross-links
- Practical/project work: innovations and entrepreneurship (real industry project, aka start-up)

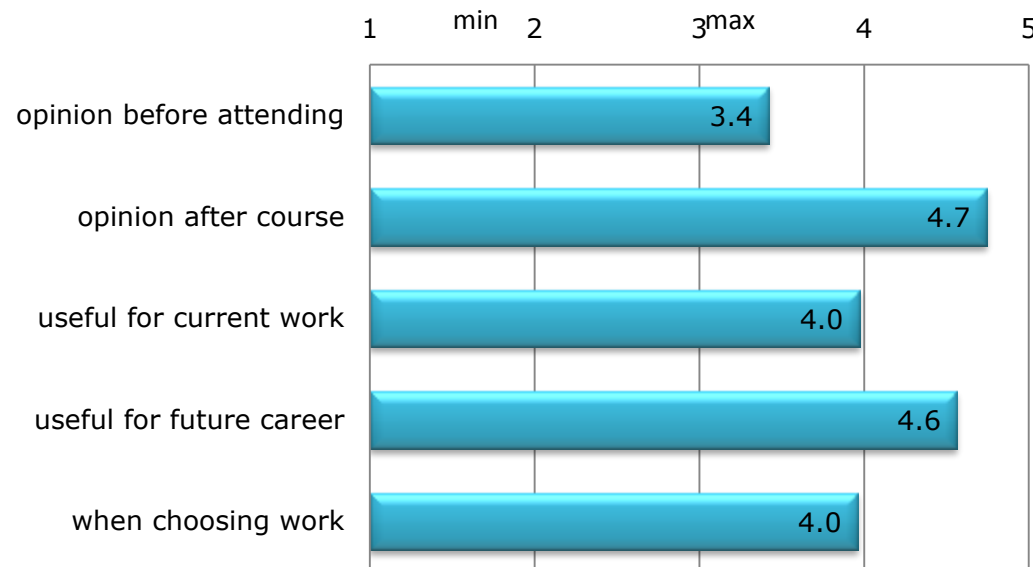
Implementation Approach

- **Courses/profiles/programs**
 - regular students + “academic” courses
 - executive/intensive courses (or mix)
- **Incremental development**
 - Early pilot courses
 - Needs assessment & content refinement (curriculum first draft)
 - Enhanced Existing Master Programs (validated profiles, >4-6 SEMP courses)
 - SEMP master profile (inter-university)
- **Project-based study**
 - 2/3 integrated content (academic + professional, 3 focus areas)
 - 1/3 practical project (“start-up” spirit, Learn by doing + mentorship)
- **Monitor Quality & Continuous Improvement**
(incl. professors and students exchange, PhD, R&D) – SEI/ISR, CMU + EU partners

Pilot Courses Feedback

Student opinion

(> 300 students, 3 pilot courses)



Institutionalize T-t-T

Universities & Partners



SEMP: Training and Qualification Center

Program content and curriculum development

Train-the-Trainer (professors qualification)

Students advanced training

academic

Business/executive profile

Common: processes, student-centric methodology, pedagogy

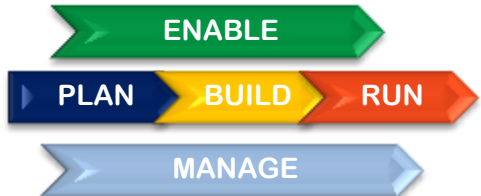
Individual qualification & accreditation paths

Qualification/accreditation maintenance

Professional courses (advanced training)

Practical course (aka "studio course") and Internship program

Compliances (1): e-CF, EQF, ECVET...



Dimension 3
e-Competence proficiency levels e-1 to e-5, related to EQF levels 3-8

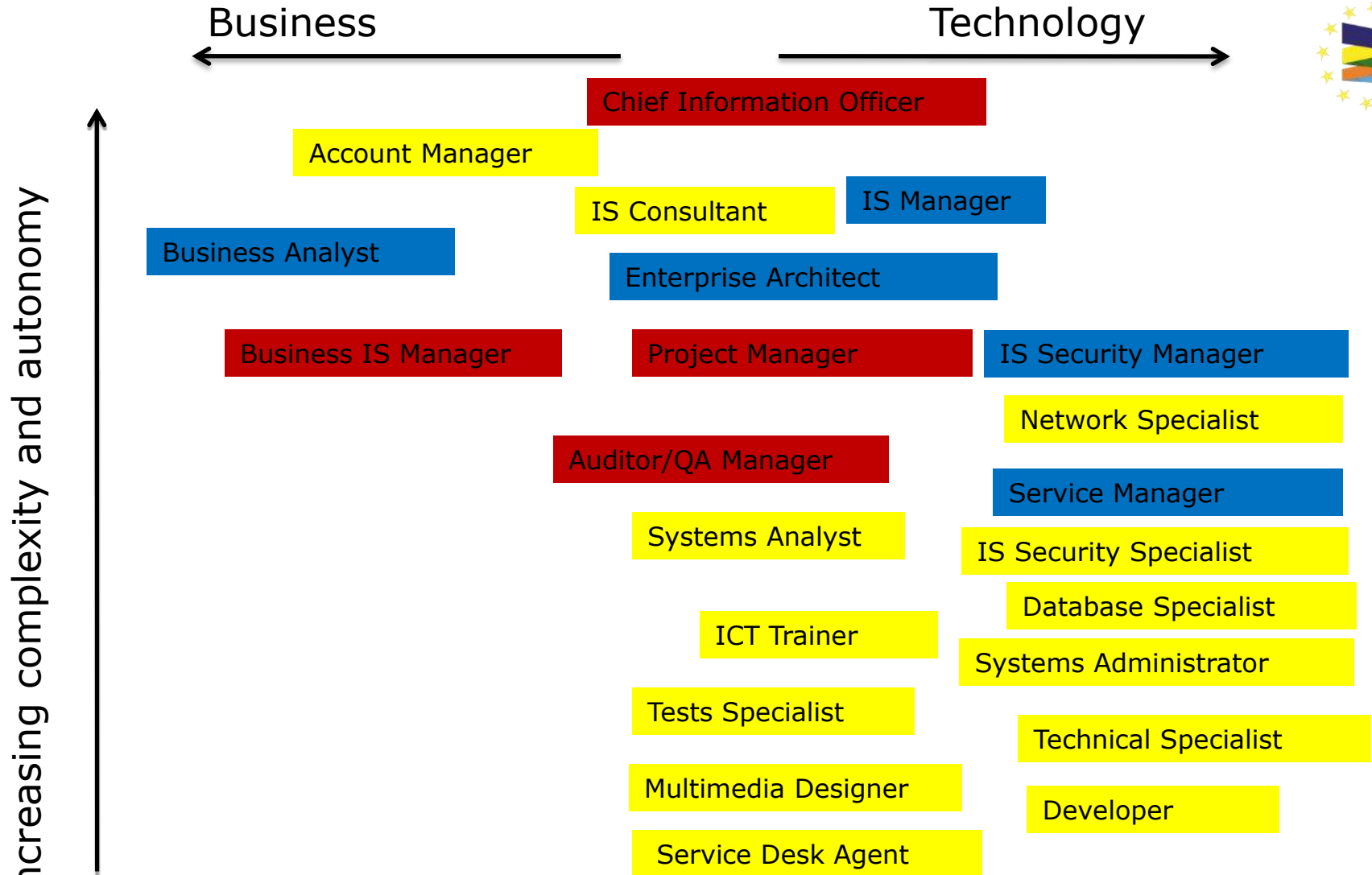
A. PLAN		Levels: 1	2	3	4	5
▶ A.1. IS and Business Strategy Alignment		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
▶ A.2. Service Level Management		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ A.3. Business Plan Development		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▶ A.4. Product or Project Planning		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ A.5. Architecture Design		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ A.6. Application Design		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ A.7. Technology Watching		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
▶ A.8. Sustainable development		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B. BUILD		Levels: 1	2	3	4	5
▶ B.1. Design and Development		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ B.2. Systems Integration		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ B.3. Testing		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ B.4. Solution Deployment		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ B.5. Documentation Production		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. RUN		Levels: 1	2	3	4	5
▶ C.1. User Support		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ C.2. Change Support		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ C.3. Service Delivery		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▶ C.4. Problem Management		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Dimension 2
36 Competences

<http://profilingtool.ecompetences.eu/>

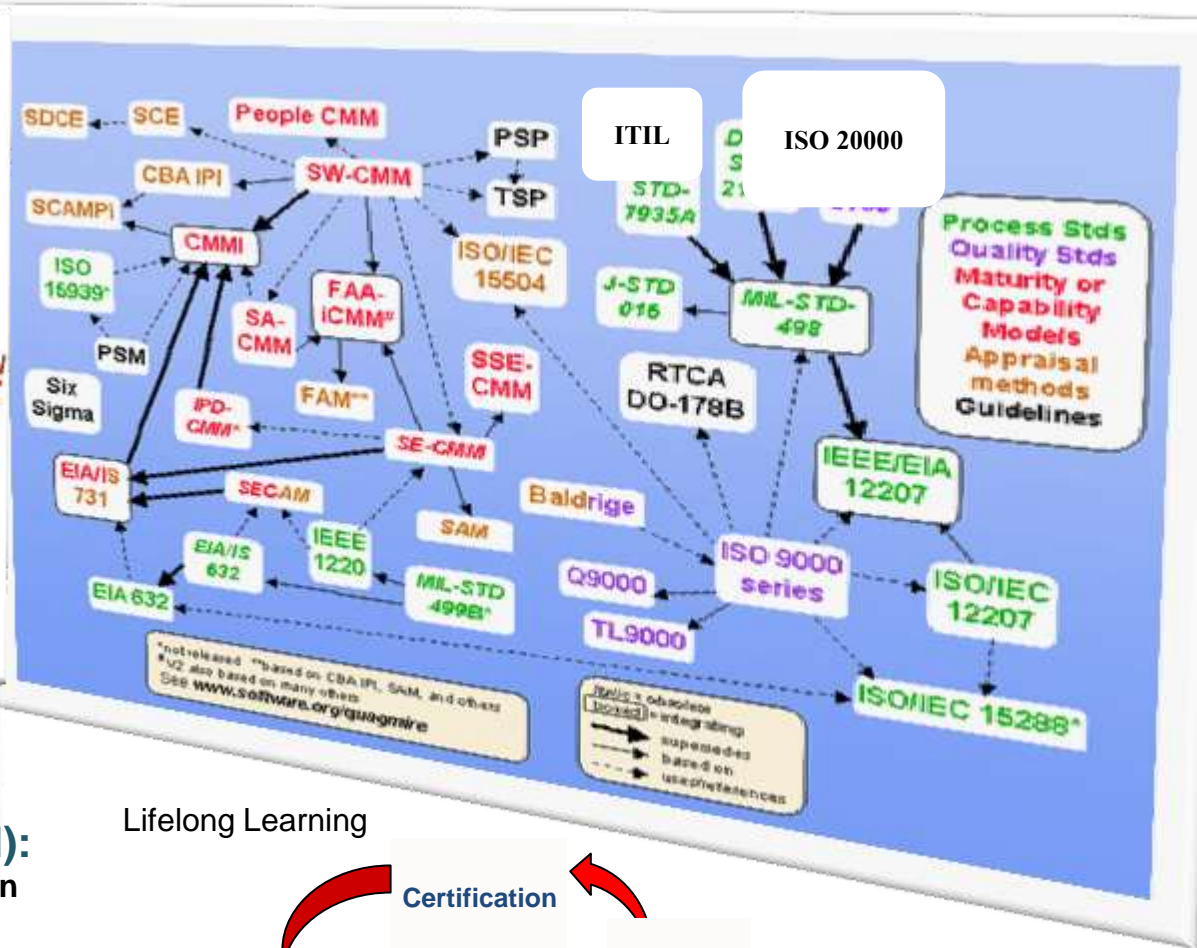
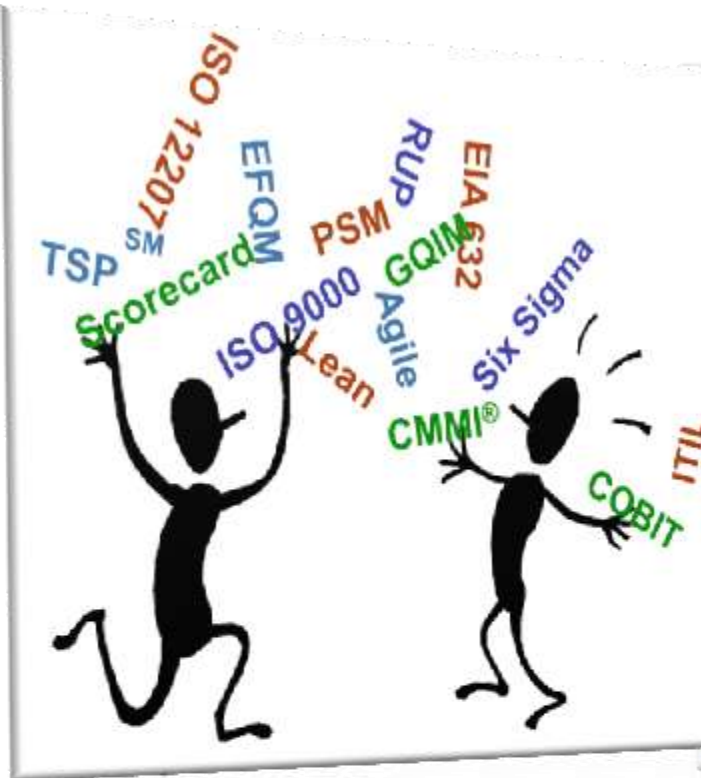
Compliances (2): European ICT profiles

["Towards European e-Job Profiles (2010-2012)", based on the e-CF www.ecompetences.eu]



Compliances (3):

Personal competences versus organizational models:
the parallel jungle?



ICT Certification in Action (CEN):

Towards a **Convergence and Harmonization**

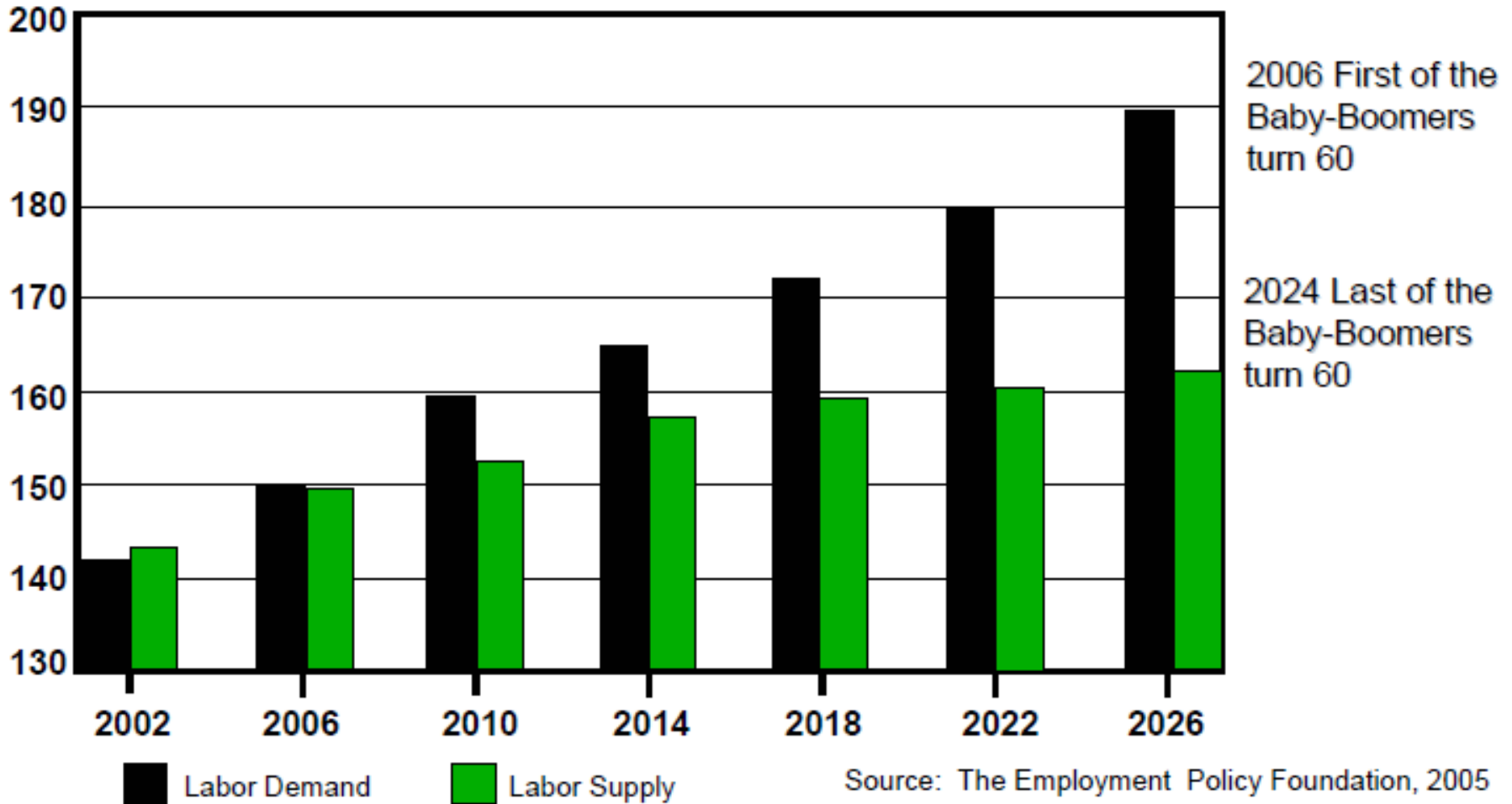
- maps of ICT certifications stakeholders
- positioning e-certifications with e-CF (v2) and EQF,
- bridging certifications with education

www.ict-certification-in-europe.eu

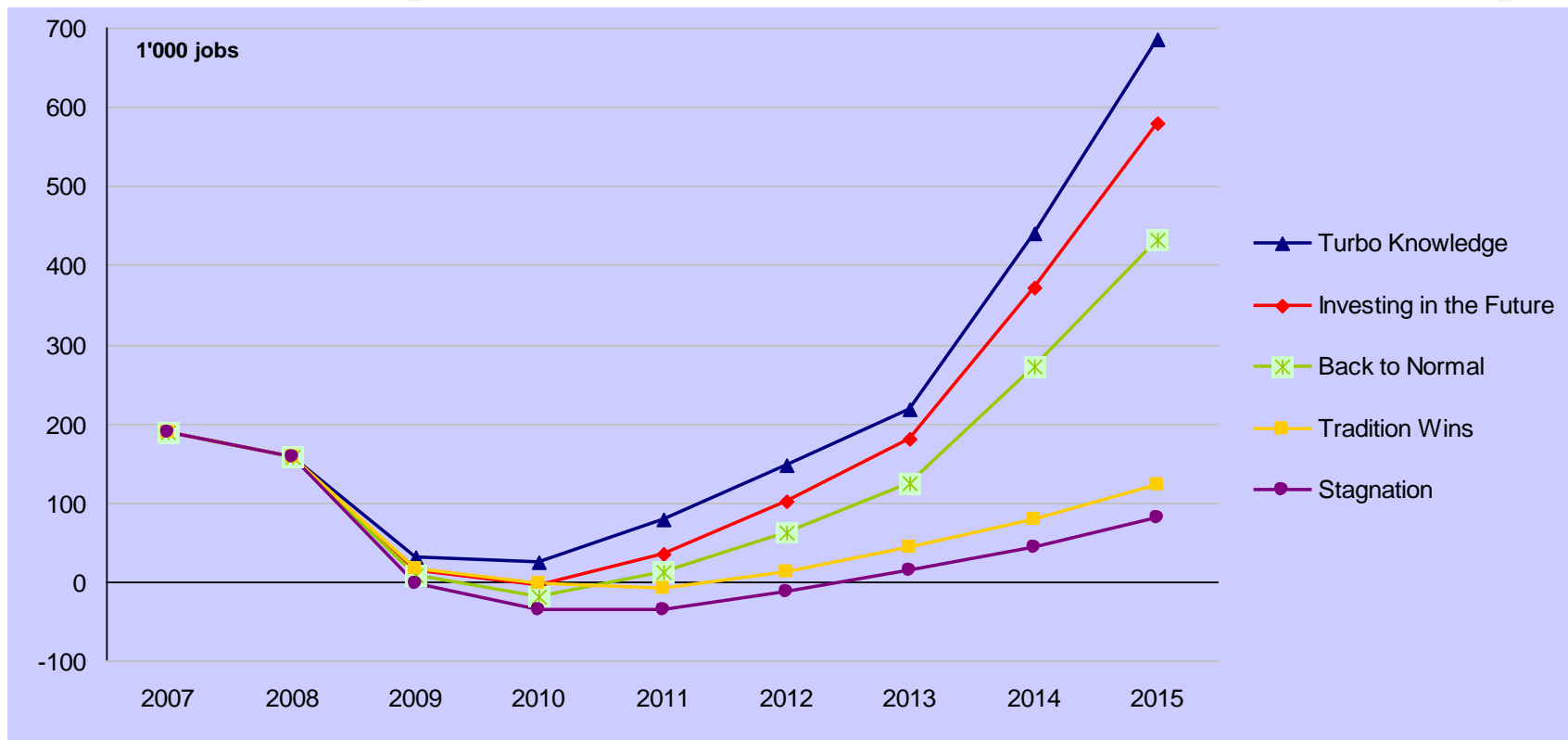
Lifelong Learning



Meeting the labor demand



IT is the job market to be in now- right?



Foresight study anticipates that the EU labour market may face an excess demand of **384,000** ICT practitioners by 2015

http://www.eskills-monitor.eu/documents/Meskills%20Scenario%20and%20Foresight%20report_final.pdf

Other compliances...

Thank you!

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5th International Conference for Entrepreneurship,
Innovation and Regional Development



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- ▶ Registration
- ▶ Call for Contributions
- ▶ Important Dates
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- ▶ Mentoring Program
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ICEIRD 2012

5th International Conference for Entrepreneurship,
Innovation and Regional Development

Regional Development for Unleashing Growth Throughout Southeastern Europe

The International Conference for Entrepreneurship, Innovation and Regional Development (ICEIRD) Consortium was formally established in 2008. It is a multi - disciplinary and cross-sectoral network crossing several streams of theory and practice, namely entrepreneurship, innovation, regional economic development and information systems. The ICEIRD Consortium was set-up with members from institutions jointly researching and collaborating in strategising/organising the annual ICEIRD conference and managing joint projects focused on the theory, policy and practice of entrepreneurship and innovation in particular as it pertains to information technologies.



One of the higher concern features of the so-called European Innovation Paradox is the divide between academic research and policy-making, between thinkers and doers. The ICEIRD can become an authoritative reference in bridging this gap by developing analysis in the field of innovation and regional policy, based on high-level academic research, but without neglecting the lessons learnt by policy makers and professionals in the field. Thus establishing experiential feedback learning loops and cross fertilization among two communities which have lived too far away from each other for far too long, and in the European Union in particular.

News

- ▶ ICEIRD 2012 launched.

DAYS LEFT

08 !
days left to ABSTRACT submission.

Partners

ORGANIZERS

