Addressing the Challenges of the Networked Society through the Next Generation of IS Masters-Level Curricula *MSIS 2016*

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- *Brian Donnellan*, National University of Ireland, Ireland
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- *Jan vom Brocke*, University of Liechtenstein, Liechtenstein
- *João Alvaro Carvalho*, University of Minho, Portugal

Task force for revising the model curriculum for Master of Science in Information Systems (MSIS) degree

AIS

Eija Helena Karsten	Åbo Akademi, Finland	(co-chair)
Bernard C.Y. Tan	National University of Singapore	
Susan Brown	University of Arizona, USA	
João Alvaro Carvalho	Universidade do Minho, Portugal	

ACM

Heikki Topi	Bentley University, USA	(co-chair)
Brian Donnellan	National University of Ireland, Ireland	
Mark Thouin	University of Texas at Dallas, USA	
Jun Shen	University of Wollongong, Australia	

Plan

2015	June	ECIS panel for reactions
		first draft for comments
	July	PACIS panel for reactions
	August	AMCIS panel for reactions
	December	Task force f2f in Fort Worth
2016	Spring	second draft for comments
	Summer	conference presentations, panels
	August	third draft presented for comments
	December	MSIS 2016 presented at ICIS Dublin

The MSIS 2016 initiative

- Global focus;
- Recognition of variations due to local contingencies (e.g. governmental digitation strategies);
- Building a profession – not just occupations;
- Foci on:
  - Entry requirements to the programs;
  - Outcome expectations of the graduates;
  - Structure of the curriculum;
    - Program length, IS courses, IT courses, domain courses, industry projects, internships, thesis, exchange periods, student work required, ...
- Body of Knowledge;
- Further education not considered (MBA, eMBA, ...).

The MSIS 2016 initiative

- AIS initiatives in the area of education...

ECIS 2015 panel

- Presenting and debating the MSIS 2016 postulates.

MSIS 2016 postulates

i. It is worth to produce curricula recommendations.
ii. Entering an IS Master's degree program requires an appropriate Bachelor's degree.
iii. An IS Master's degree provides the competences needed for starting as an IS professional career.
iv. Existing ICT competence frameworks (e-CF, SFIA, …) are a good starting point for MSIS curricula development.

Postulate 1

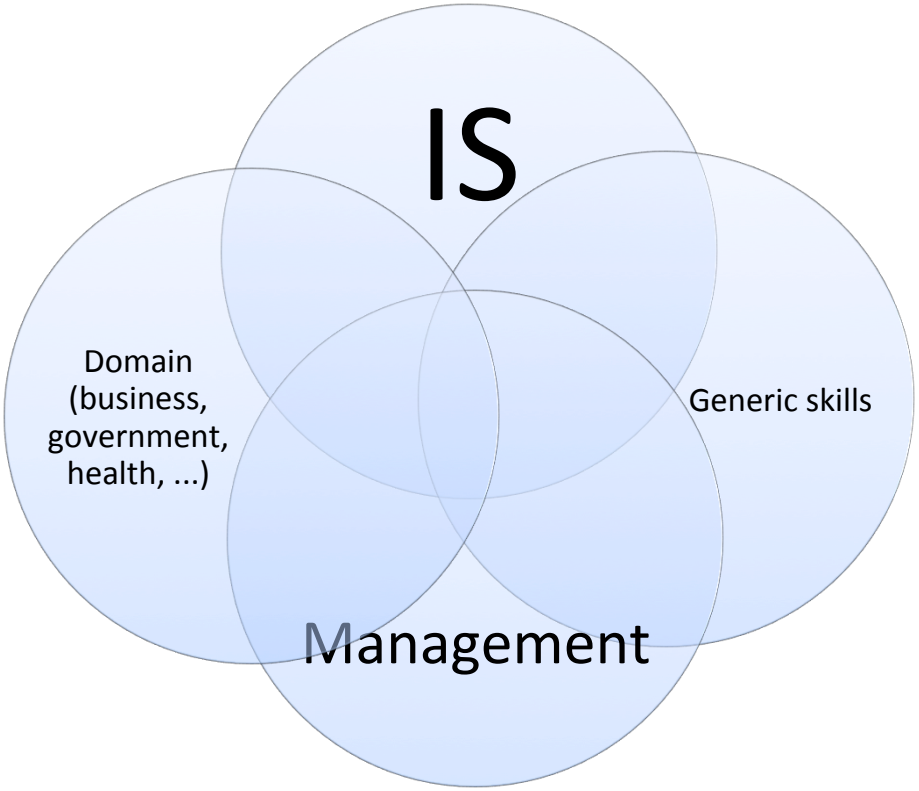
IT IS WORTH TO PRODUCE CURRICULA RECOMMENDATIONS.

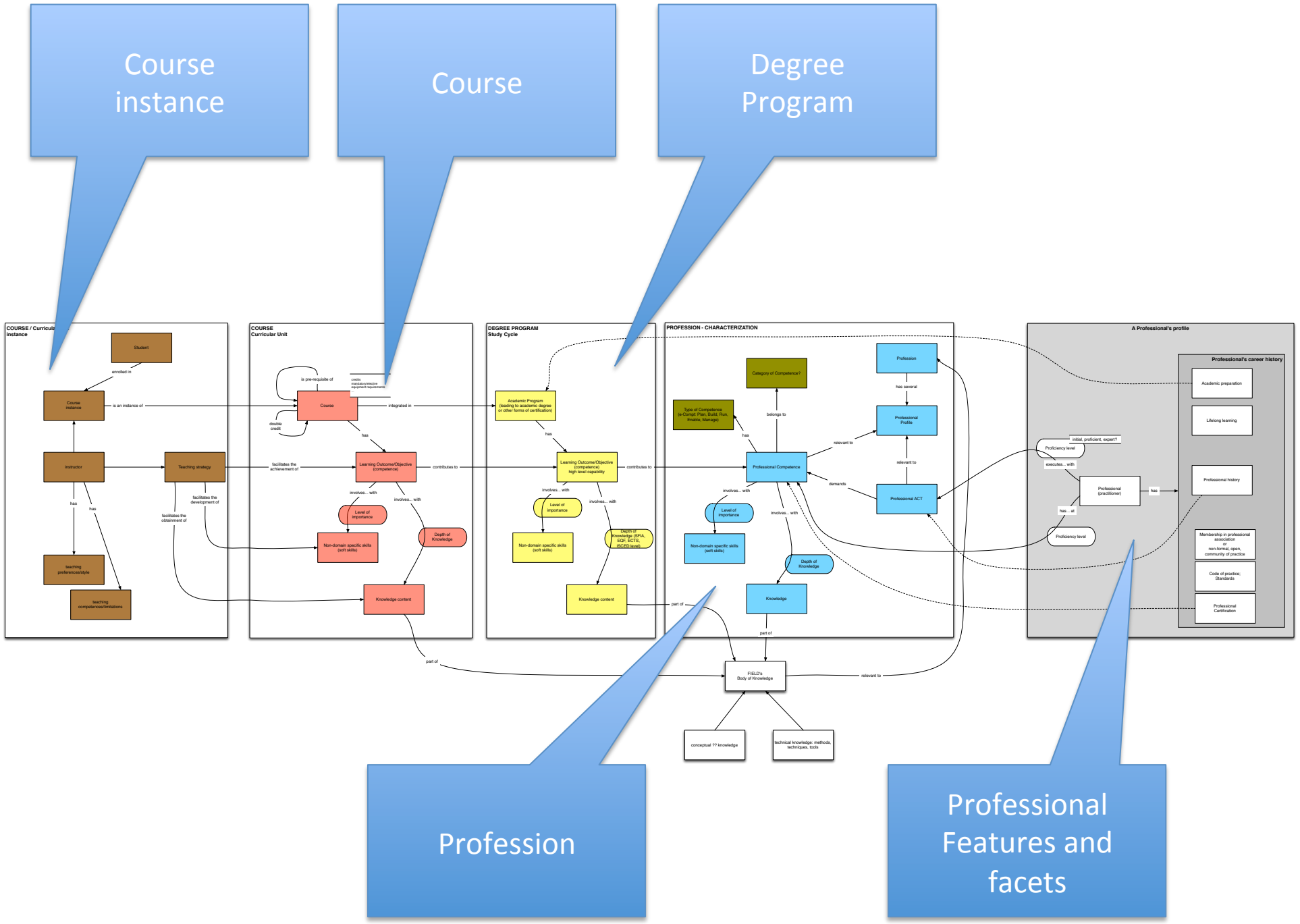
Why curricula recommendations

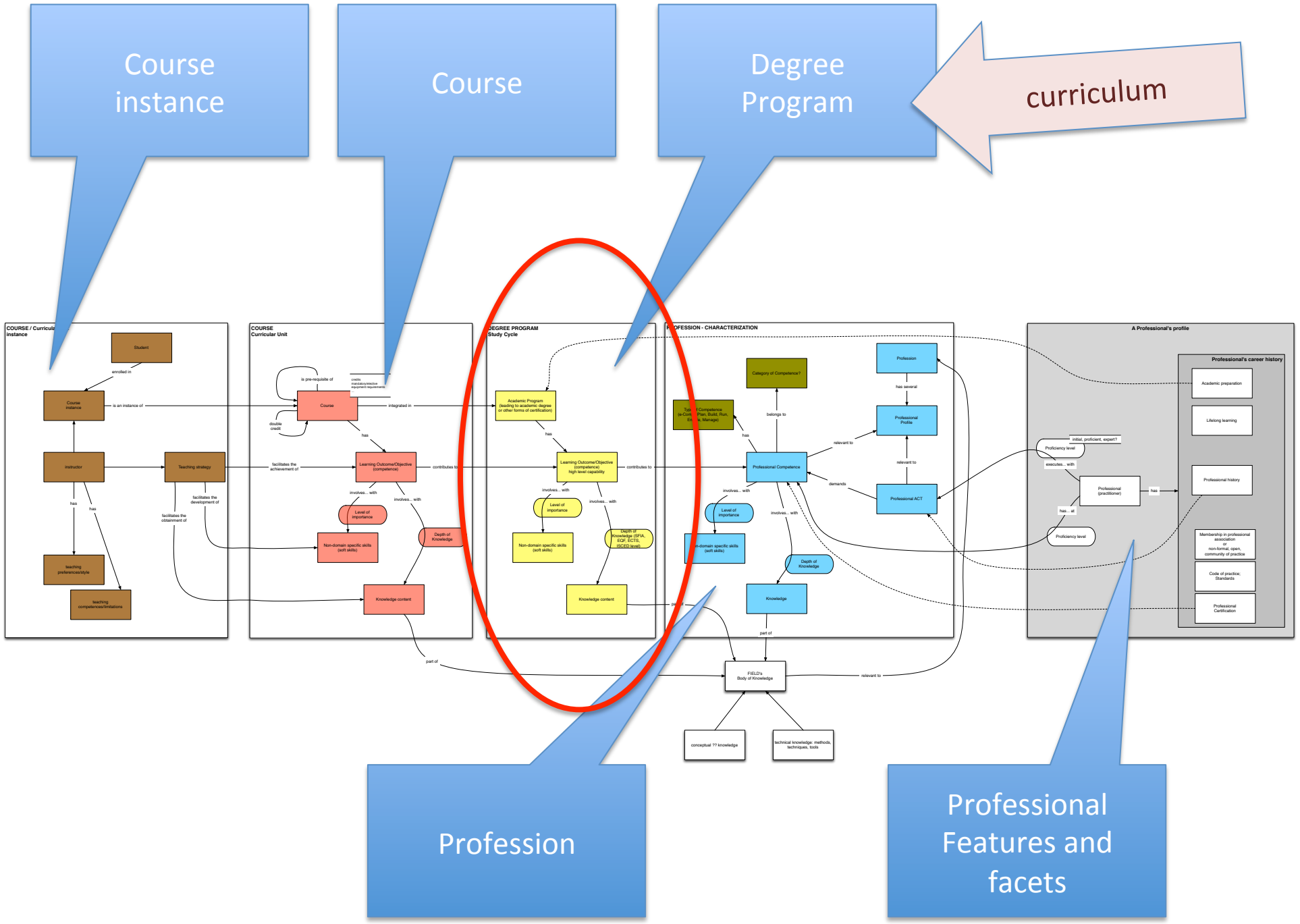
- They play an important role in the development of academic and professional fields.
- They reflect consensual views for the education in the field => contribute to the field's **identity**.
- They are a valuable instrument for curricula designers and for program managers, and
  an authoritative reference for program evaluators and accreditors.

- To reflect a shared view of the field and of its good practices in education, the development of curricula recommendations must be a participated project.
- Participation is desired from educators, curricula designers, academic program managers, practitioners, students and other stakeholders.
- The MSIS 2016 task force is well aware of this requisite and it is committed to engage all stakeholders along the project.

Contents in MSIS




Course instance
Course
Degree Program
COURSE / Curricular instance
Student
enrolled in
Course instance
is an instance of
instructor
Teaching strategy
has
has
facilitates the obtainment of
facilitates the development of
teaching preferences/style
teaching competences/limitations
COURSE
Curricular Unit
is pre-requisite of
credits
mandatory/elective
equipment requirements
Course
double credit
integrated in
has
facilitates the achievement of
Learning Outcome/Objective (competence)
contributes to
involves... with
involves... with
Level of importance
Depth of Knowledge
Non-domain specific skills (soft skills)
Knowledge content
part of
DEGREE PROGRAM
Study Cycle
Academic Program (leading to academic degree or other forms of certification)
has
Learning Outcome/Objective (competence) high level capability
contributes to
involves... with
involves... with
Level of importance
Depth of Knowledge (DFIA, EQF, ECTS, ISCED level)
Non-domain specific skills (soft skills)
Knowledge content
part of
PROFESSION - CHARACTERIZATION
Category of Competence?
Profession
has several
Type of Competence (e-Compt: Plan, Build, Run, Enable, Manage)
belongs to
Professional Profile
has
relevant to
relevant to
Professional Competence
demands
Professional ACT
involves... with
involves... with
Level of importance
Depth of Knowledge
Non-domain specific skills (soft skills)
Knowledge
part of
FIELD's Body of Knowledge
relevant to
conceptual ?? knowledge
technical knowledge: methods, techniques, tools
A Professional's profile
Professional's career history
Academic preparation
Lifelong learning
Professional history
Membership in professional association or non-formal, open, community of practice
Code of practice; Standards
Professional Certification
Proficiency level
initial, proficient, expert?
executes... with
Professional (practitioner)
has
has... at
Proficiency level
Profession
Professional Features and facets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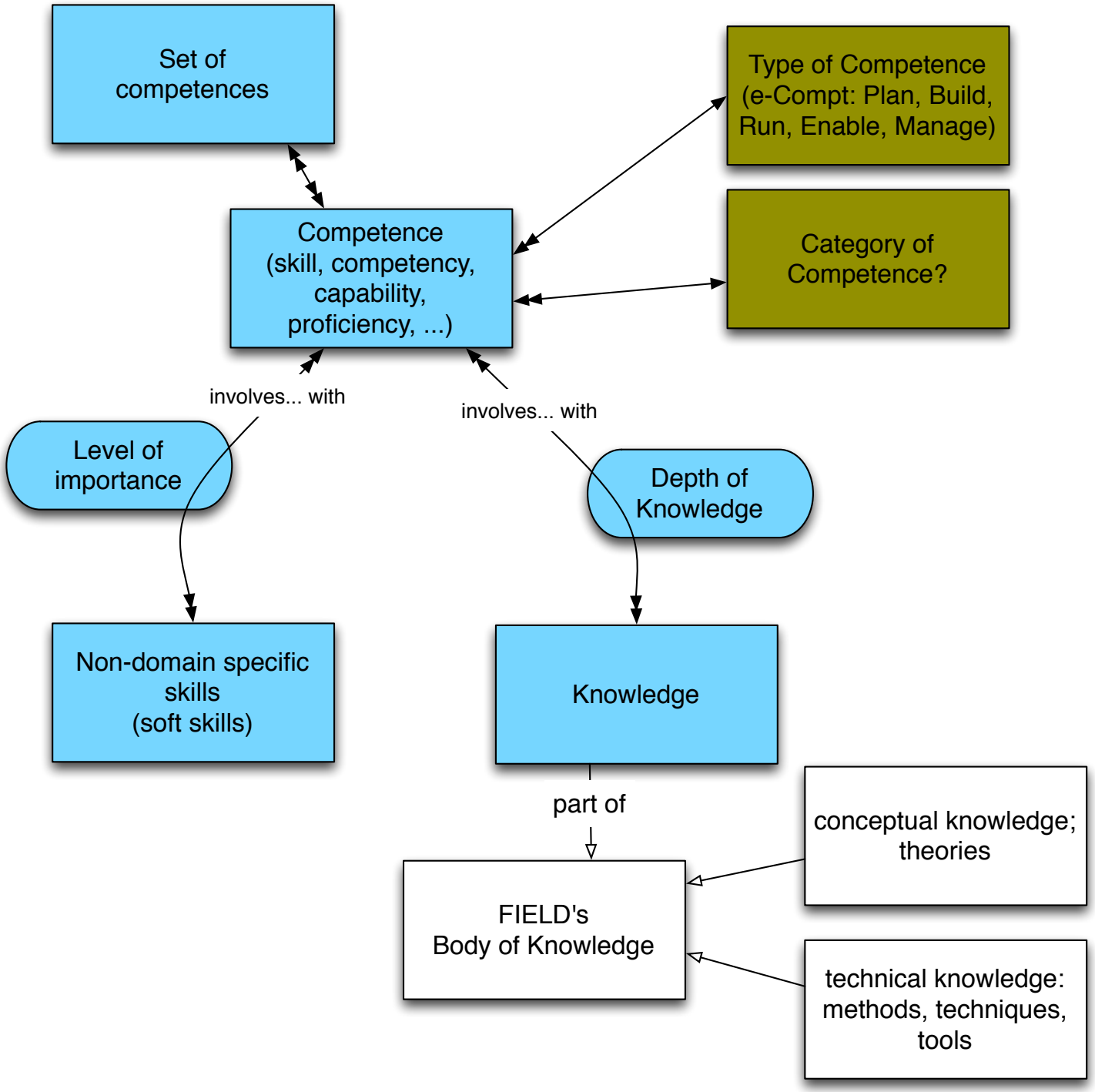
Set of competences
Type of Competence (e-Compt: Plan, Build, Run, Enable, Manage)
Competence (skill, competency, capability, proficiency, ...)
Category of Competence?
involves... with
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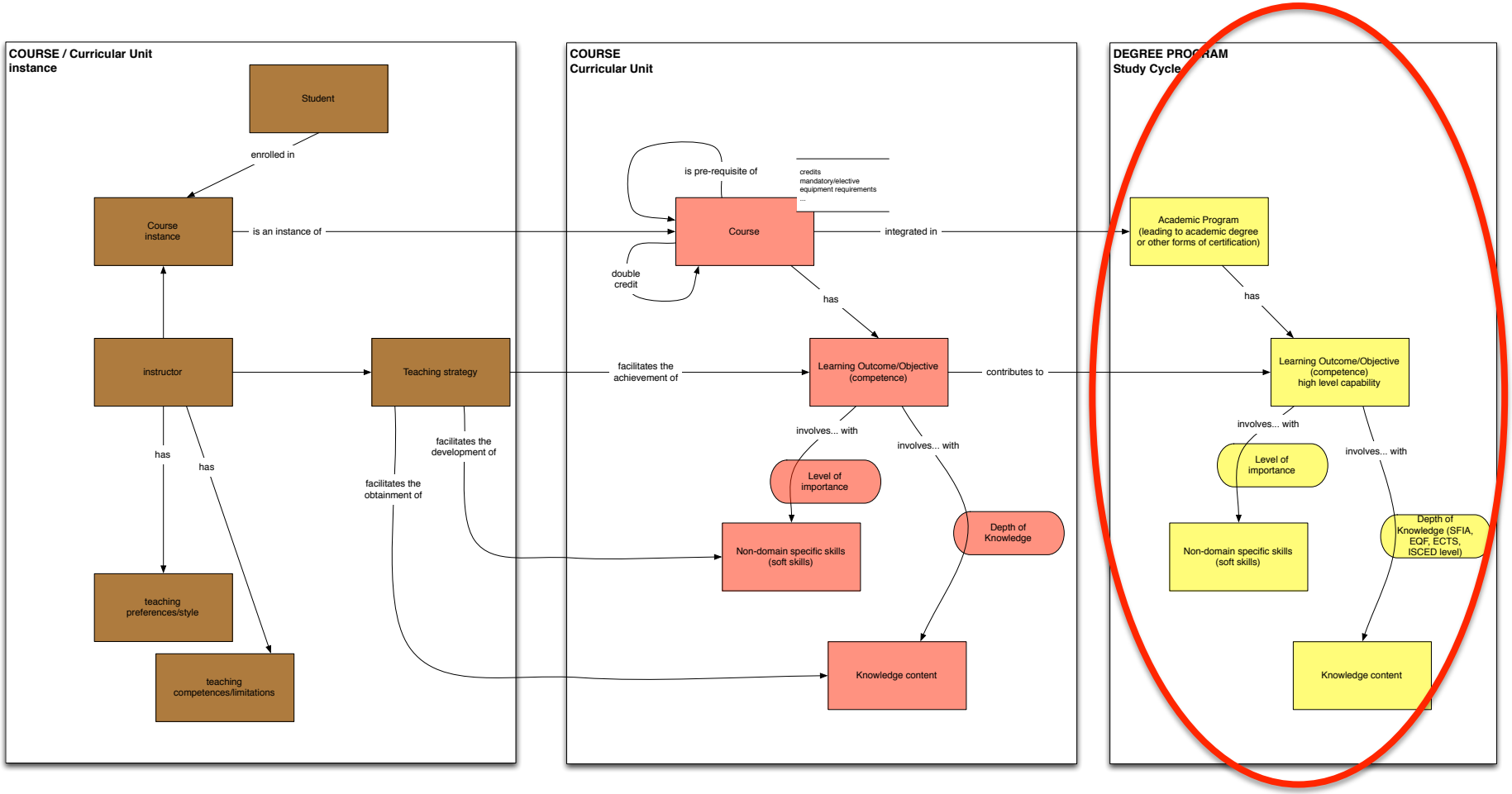
Academic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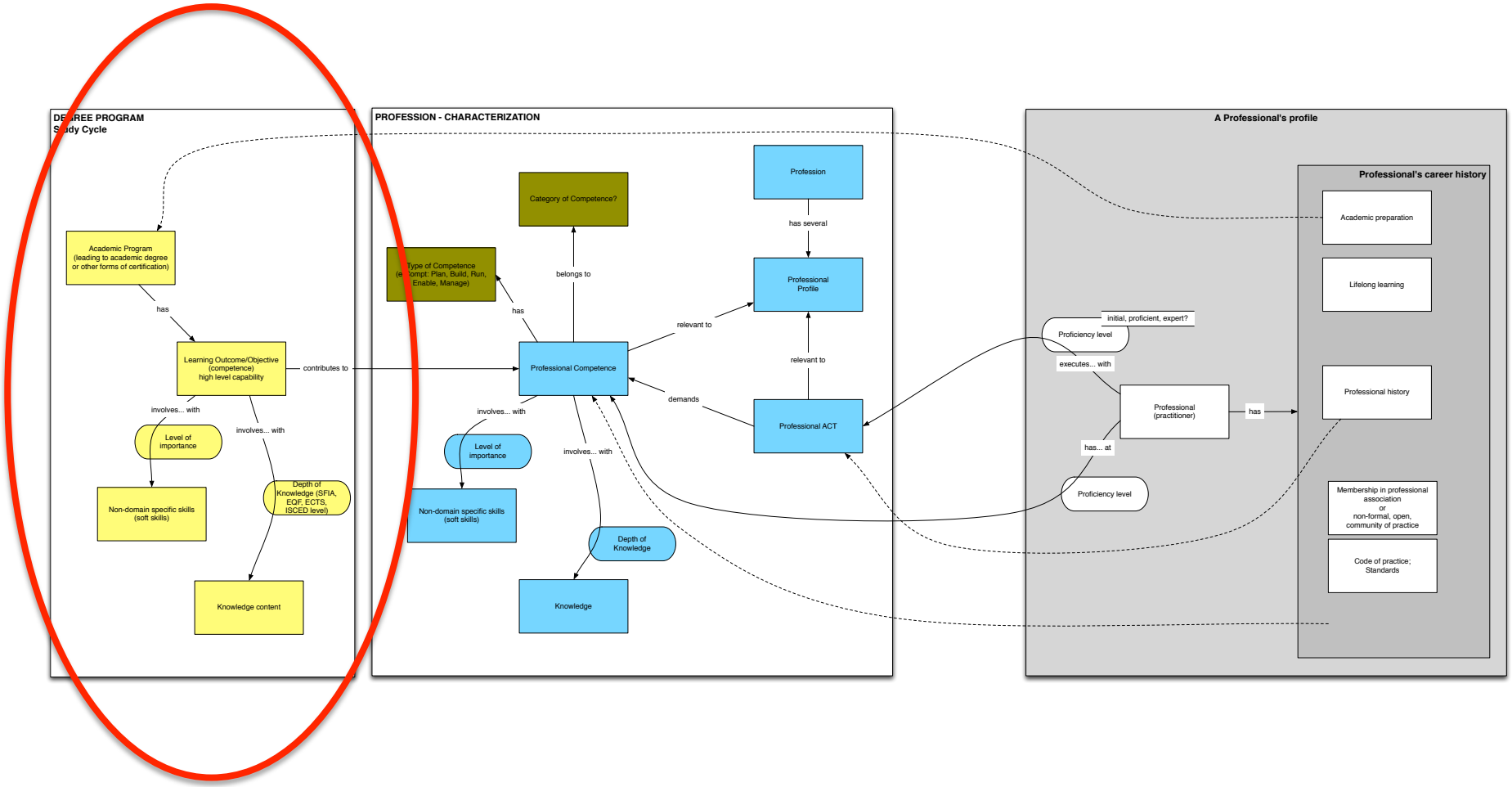
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Code of practice;
Standards

Postulate 2

ENTERING AN IS MASTER'S DEGREE PROGRAM REQUIRES AN APPROPRIATE BACHELOR'S DEGREE.

An appropriate Bachelor's degree

- Example 1
  - Entry requirements for a Master's program in Köln requires an appropriate Bachelor's degree in Wirtschaftinformatik which includes a minimum of:
    - Wirtschaftsinformatik – 20 credits
    - Business – 30 credits
    - Informatik – 20 credits
    - Mathematics or Statistics – 10 credits

An appropriate Bachelor's degree

- Example 2

Welcome!

In the Master's course "Innovation and Information Management", knowledge in the field of business management, macroeconomics, as well as legal skills is being deepened and interconnected with IT-Management skills in a target-oriented way.

Through work on practical case studies, you will learn how IT can be used successfully during development and exploitation of innovation processes. You will be in a position to work as a specialist and manager in the interrelated specialists departments of innovation and information technologies. You will also be able to initiate and control change processes in different divisions of the company. A typical example is the position as a Chief Information Officer or Manager of Information and Process Management. Part of this job is to support the department's innovation and change-procedures by developing and optimize IT-Systems on the basis of a business oriented process analysis and optimization.

We are looking forward to supporting your professional development by attending our Master's course "Innovation and Information Management".

A. Gadatsch

Prof. Dr. Andreas Gadatsch
Head of the Master's course
Innovation and Information Management

Admission Requirements

- Bachelor's degree with 210 credit points or Diploma degree
- Applicants with a Bachelor's degree of 180 credit points have to complete a so called adaption semester (Master's Prep) before they start the Master's programme.
- The Bachelor and Diploma degree must be related to a study programme in Business Administration or Business Information Systems.
- For more information about the minimum grade of the Bachelor or Diploma degree please take a look at our website: http://fachbereich01.de/ZulassungInnovation.html
- Applicants who do not have a German final degree need to have a proof of the language skills which are necessary for the Master´s programme, for example the succesfully passed German language test "Deutsche Sprachprüfung für den Hochschulzugang" (German language test for the access to higher education; 3rd level), TestDaf or an equivalent test.

Contents

1st semester

	CP*
Behaviour in Meetings and Communication	4
Inferential Statistics and Multivariate Methods	4
Innovation Management	4
Organizational Development	4
Selected Issues in IT Law	6

2nd semester

	CP*
Quantitative Methods of Planning and Decision	4
HR Management	4
Information Management	8
Electronic Marketplaces and Networks	4
IT Innovation Management	4

3rd semester

	CP*
Business or Research Project	6
IT Controlling	4
Change Management	4
Management of Complex Projects	4
Quality Management	4

4th semester

	CP*
Case Studies in Innovation Management	4
Master Thesis	18
Final Oral Examination	2

CP: Creditpoints

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CP: Creditpoints

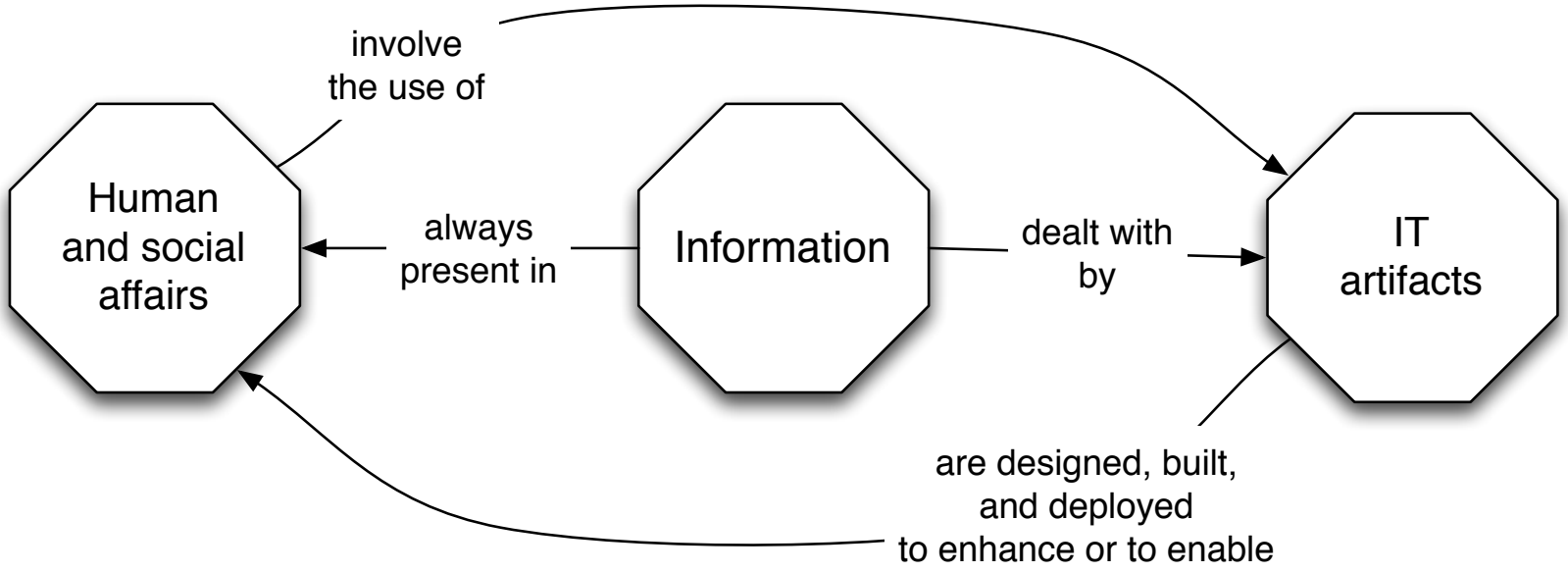
Bridge studies

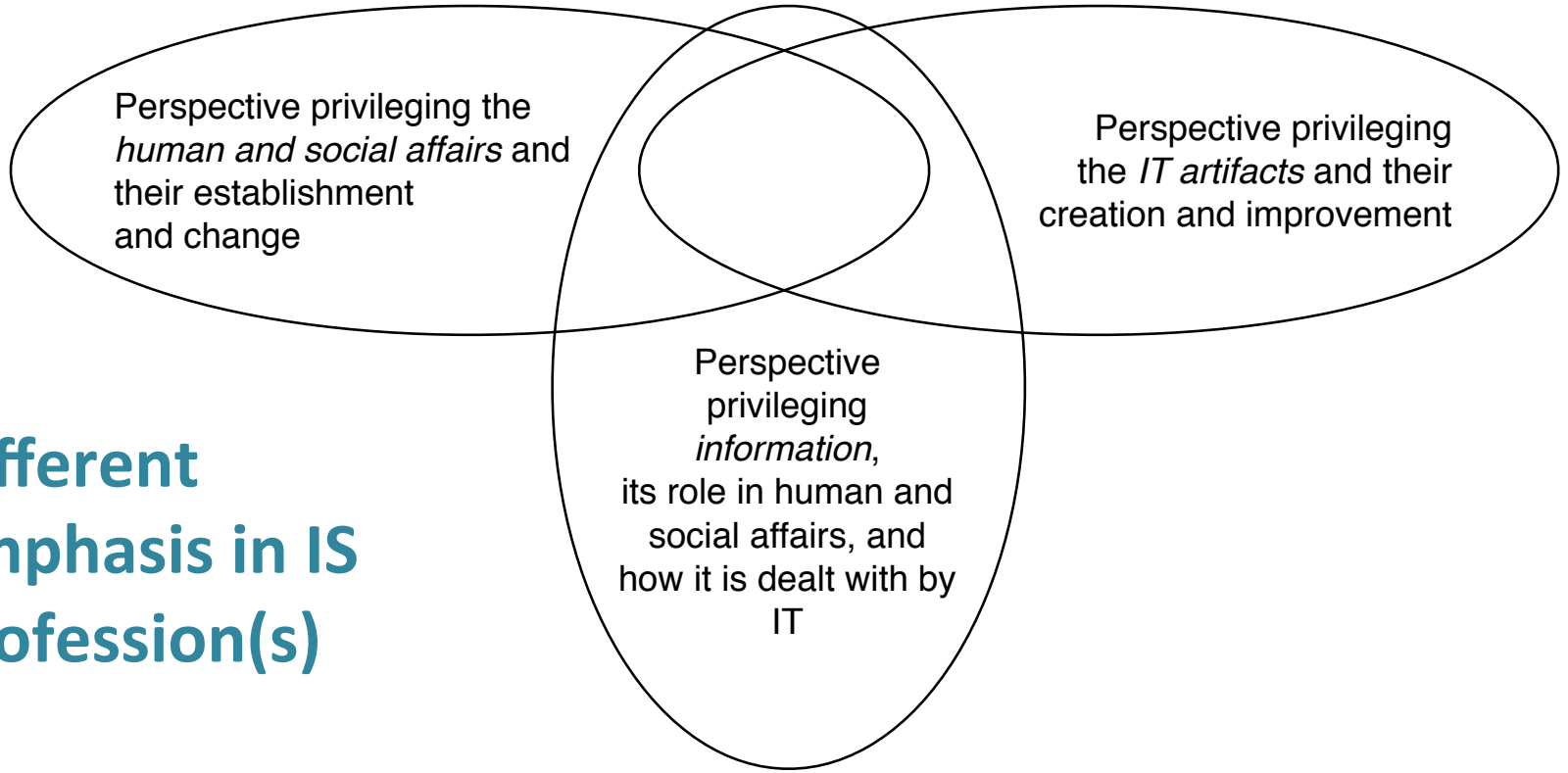
- If candidates have a BSc degree in IT or CS:
  - Domain area – 30 (?) credits

- If candidates have a BSc degree in a domain area:
  - Information Systems - 20 (?) credits
  - CS or IT – 10 (?) credits

Postulate 3

AN IS MASTER'S DEGREE PROVIDES THE COMPETENCIES NEEDED FOR STARTING AS AN IS PROFESSIONAL CAREER.





Different emphasis in IS profession(s)

Inspiration from other areas

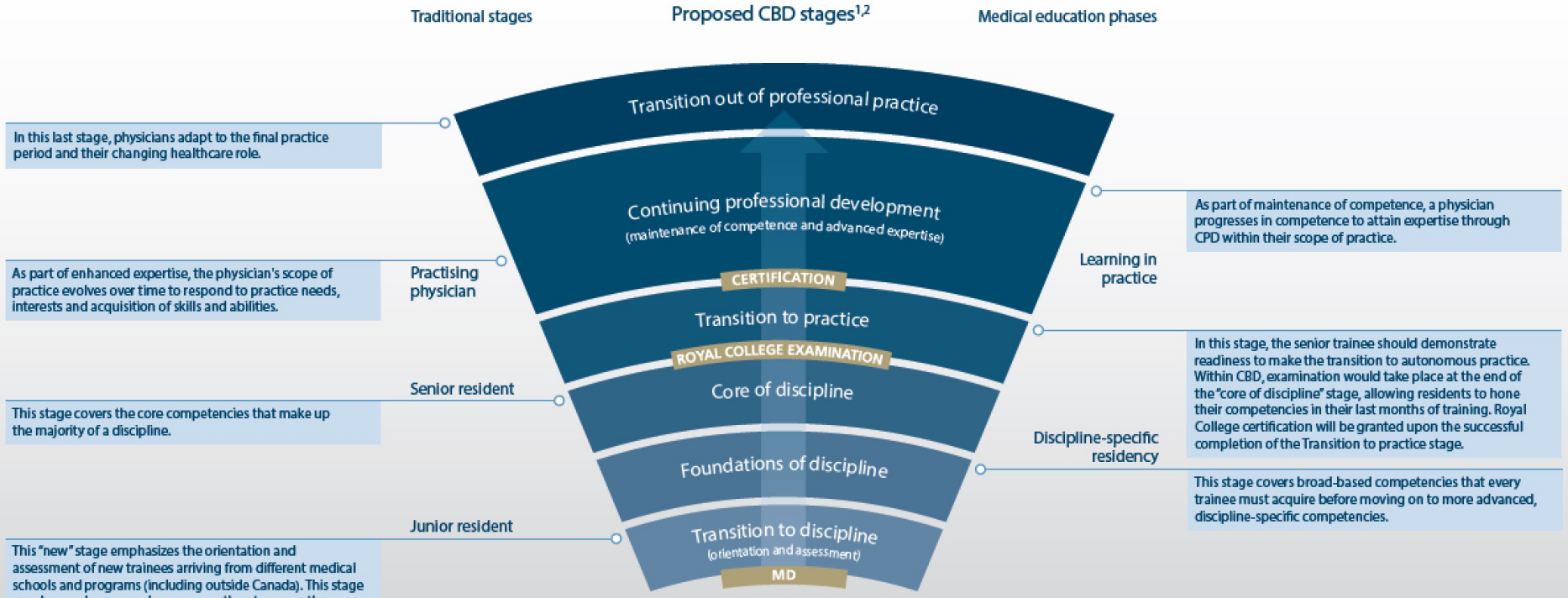
- Medicine

ROYAL COLLEGE
OF PHYSICIANS AND SURGEONS OF CANADA

CanMEDS 2015

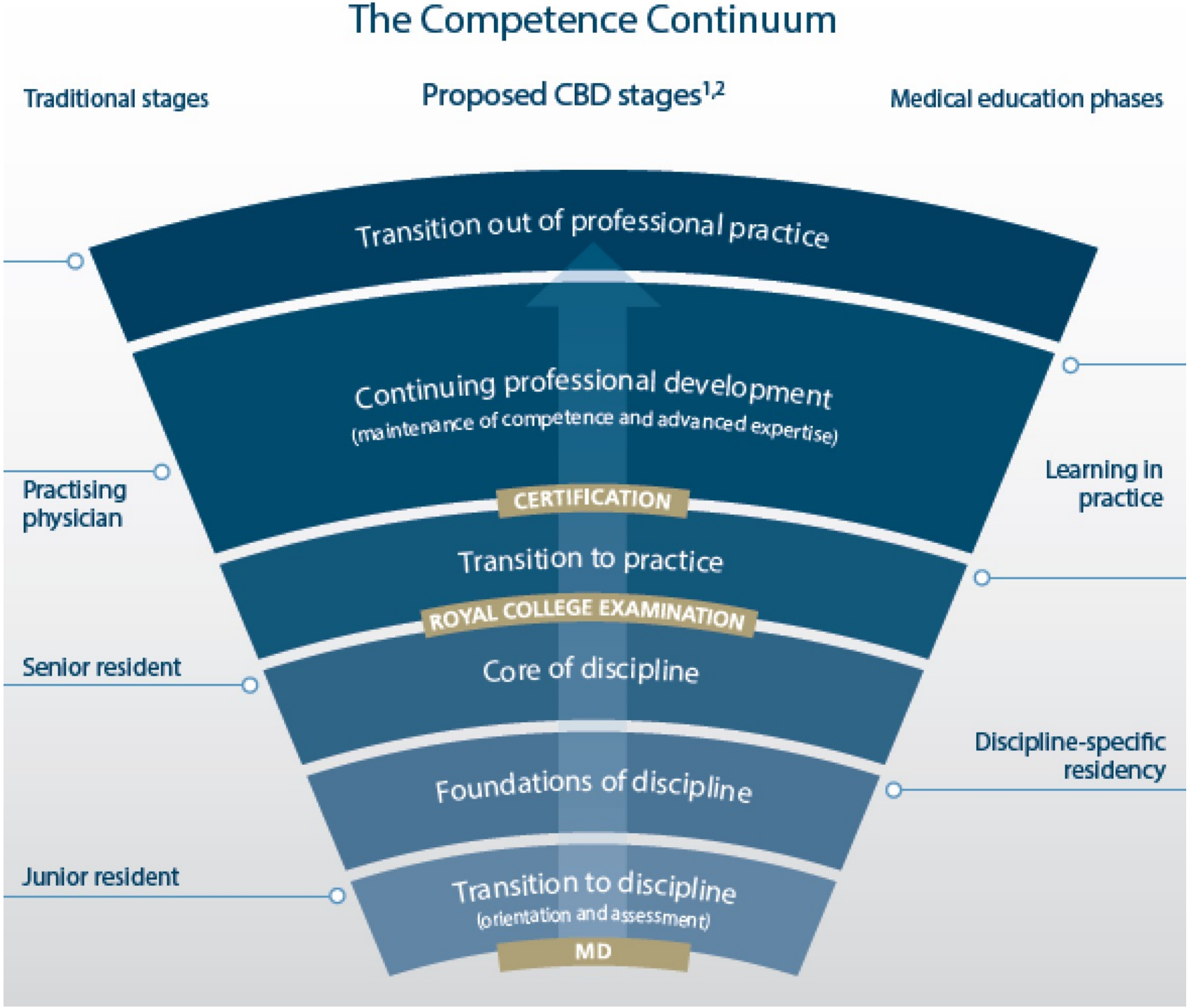
Competence by Design

The Competence Continuum



[1] Competence by Design (CBD)
[2] Milestones at each stage describe terminal competencies

September 2014


The Competence Continuum
Traditional stages
Proposed CBD stages[1,2]
Medical education phases
Transition out of professional practice
Continuing professional development
(maintenance of competence and advanced expertise)
CERTIFICATION
Transition to practice
ROYAL COLLEGE EXAMINATION
Core of discipline
Foundations of discipline
Transition to discipline
(orientation and assessment)
MD
Practising physician
Senior resident
Junior resident
Learning in practice
Discipline-specific residency

Postulate 4

EXISTING ICT COMPETENCES FRAMEWORKS (E-CF, SFIA, …) ARE A GOOD STARTING POINT FOR MSIS CURRICULA DEVELOPMENT.

Competence frameworks

Taking into consideration the location of ECIS, it is natural that special attention will be paid to European issues.

Since the publication of MSIS 2006, Europe went through developments in the education arena that are relevant to the work of the MSIS 2016 task force.

The following European initiatives are particularly interesting:

- European Credit Transfer and Accumulation System (ECTS);
- European Qualification Framework (EQF);
- European e-Competences Framework (e-CF);
- initiatives by the Council of European Professional Informatics Societies (CEPIS).

SFIA

Skills Framework for the Information Age

Category	Subcategory	Skill	Code	1	2	3	4	5	6	7
Strategy and architecture	Information strategy	IT governance	GOVN					5	6	7
		Information management	IRMG				4	5	6	7
		Information systems co-ordination	ISCO						6	7
		Information security	SCTY			3	4	5	6	
		Information assurance	INAS					5	6	7
		Information analysis	INAN			3	4	5	6	7
		Information content publishing	ICPM	1	2	3	4	5	6	
	Advice and guidance	Consultancy	CNSL					5	6	7
		Technical specialism	TECH				4	5	6	
	Business strategy and planning	Research	RSCH			3	4	5	6	
		Innovation	INOV					5	6	
		Business process improvement	BPRE					5	6	7
		Enterprise & business architecture development	STPL					5	6	7
		Business risk management	BURM				4	5	6	7
		Sustainability strategy	SUST					5	6	
	Technical strategy and planning	Emerging technology monitoring	EMRG				4	5	6	
		Continuity management	CODL				4	5		
		Software development process improvement	SPIM					5	6	7
		Sustainability management for IT	SUMI					5	6	
		Network planning	NTPL					5	6	
		Solution architecture	ARCH					5	6	
		Data management	DATM				4	5	6	
		Methods and tools	METL				4	5	6	
Business change	Business change implementation	Portfolio management	POMG					5	6	7
		Programme management	PGMG						6	7
		Project management	PRMG				4	5	6	7
		Portfolio, programme and project support	PROF		2	3	4	5		
	Business change management	Business analysis	BUAN			3	4	5	6	
		Requirements definition and management	REQM		2	3	4	5	6	
		Business process testing	BPTS				4	5	6	
		Change implementation planning & management	CIPM					5	6	
		Organisation design and implementation	ORDI					5	6	
		Benefits management	BENM					5	6	
		Business modelling	BSMO		2	3	4	5	6	
		Sustainability assessment	SUAS				4	5	6	
	Relationship management	Stakeholder relationship management	RLMT				4	5	6	7
	Skills management	Learning and development management	ETMG			3	4	5	6	7
		Learning and development assessment	LEDA			3	4	5	6	
		Learning design and development	TMCR				4	5		
		Learning delivery	ETDL			3	4	5		
		Teaching and subject formation	TEAC					5	6	
		Resourcing	RESC					5	6	
		Professional development	PDSV				4	5	6	
Solution development and implementation	Systems development	Systems development management	DLMG					5	6	7
		Data analysis	DTAN		2	3	4	5		
		Systems design	DESN		2	3	4	5	6	
		Network design	NTDS					5	6	
		Database/repository design	DBDS		2	3	4	5	6	
		Programming/software development	PROG		2	3	4	5		
		Animation development	ADEV			3	4	5	6	
		Safety engineering	SFEN			3	4	5	6	
		Sustainability engineering	SUEN				4	5	6	
		Information content authoring	INCA	1	2	3	4	5	6	
		Testing	TEST	1	2	3	4	5	6	
	Human factors	User experience analysis	UNAN			3	4	5		
		Ergonomic design	HCEV			3	4	5	6	
		User experience evaluation	USEV		2	3	4	5		
		Human factors integration	HFIN					5	6	7
	Installation and integration	Systems integration	SINT		2	3	4	5	6	
		Porting/software integration	PORT			3	4	5	6	
		Systems installation/decommissioning	HSIN	1	2	3	4	5		
Service management	Service strategy	IT management	ITMG					5	6	7
		Financial management for IT	FMIT				4	5	6	
	Service design	Capacity management	CPMG				4	5	6	
		Availability management	AVMT				4	5	6	
		Service level management	SLMO		2	3	4	5	6	7
	Service transition	Service acceptance	SEAC				4	5	6	
		Configuration management	CFMG		2	3	4	5	6	
		Asset management	ASMG				4	5	6	
		Change management	CHMG		2	3	4	5	6	
		Release and deployment	RELM			3	4	5	6	
	Service operation	System software	SYSP			3	4	5		
		Security administration	SCAD			3	4	5	6	
		Radio frequency engineering	RFEN		2	3	4	5	6	
		Applications support	ASUP		2	3	4	5		
		IT operations	ITOP	1	2	3	4			
		Database administration	DBAD		2	3	4	5		
		Storage management	STMG			3	4	5	6	
		Network support	NTAS		2	3	4	5		
		Problem management	PBMG			3	4	5		
		Service desk and incident management	USUP	1	2	3	4	5		
		IT estate management	DCMA			3	4	5	6	
Procurement and management support	Supply management	Procurement	PROC				4	5	6	7
		Supplier relationship management	SURE		2	3	4	5	6	7
		Contract management	ITCM				4	5	6	
	Quality and conformance	Quality management	QUMG					5	6	7
		Quality assurance	QUAS			3	4	5	6	
		Quality standards	QUST		2	3	4	5		
		Conformance review	CORE			3	4	5	6	
		Safety assessment	SFAS					5	6	
		Technology audit	TAUD				4	5	6	7
Client interface	Sales and marketing	Marketing	MKTG			3	4	5	6	
		Selling	SALE				4	5	6	
	Client support	Account management	ACMG					5	6	
		Sales support	SSUP	1	2	3	4	5	6	
		Client services management	CSMG			3	4	5	6	

e-CF

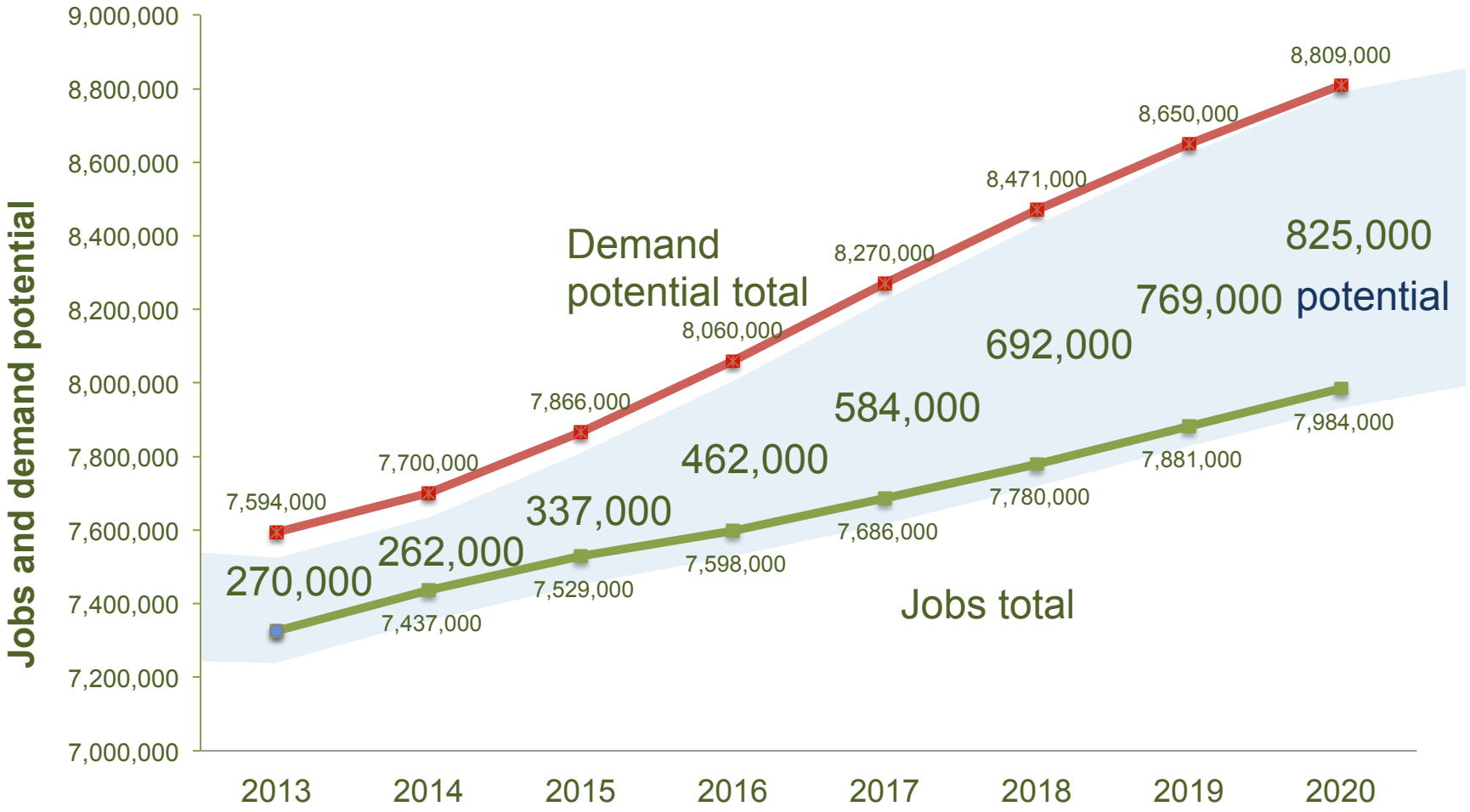
European e-Competence Framework 3.0 overview

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				■	■

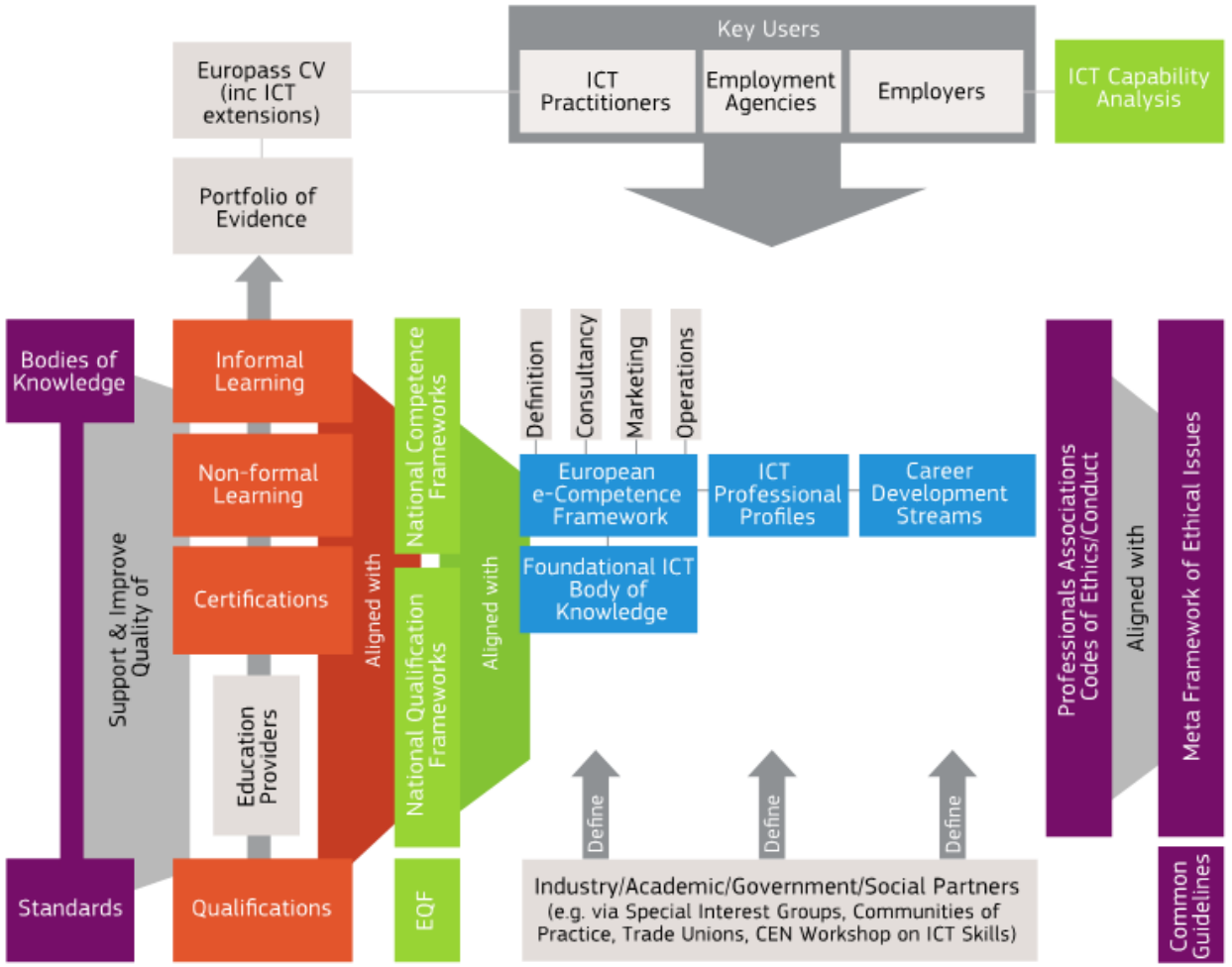
European e-Competence Framework

EU28 - Main Forecast Scenario



Source: empirica and IDC

European Framework for ICT Professionalism



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 2: 40 competences
  Dimension 3: 5 e-CF levels
  Dimension 4: knowledge & skills examples

European e-Competence Framework

e-CF 3.0 overview

- Five e-Competence areas (Dimension 1)
- Forty e-Competences (Dimension 2)
- Five proficiency levels (Dimension 3)
- knowledge and skills examples (Dimension 4)

Dimension 1	Dimension 2	Dimension 3				
5 e-competence areas (A - E)	40 e-competences identified	e-competence proficiency levels e-1 to e-5 (related to EQF levels 3-8)				
		e-CF levels identified for each competence				
		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		■	■	■	
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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-Competence example

Dimension 1 e-Competence area	A. PLAN				
Dimension 2	A.1. IS and Business Strategy Alignment				
e-Competence: Title + generic description	Anticipates long term business requirements and determines the IS model in line with organisation policy. Makes strategic IS policy decisions for the enterprise, including sourcing strategies				
Dimension 3	Level 1	Level 2	Level 3	Level 4	Level 5
e-Competence proficiency levels (on e-CF levels e-1 to e-5, related to EQF levels 3 to 8)	—	—	—	Provides leadership for the construction and implementation of long term innovative IS solutions.	Provides IS strategic leadership to reach consensus and commitment from the management team of the enterprise.
Dimension 4					
Knowledge examples	Knows/ Aware of/ Familiar with: K1 business strategy concepts K2 trends and implications of ICT internal or external developments for typical organisations K3 the potential and opportunities of relevant business models K4 the business aims and organisational objectives K5 the issues and implications of sourcing models				
Skills examples	Able to: S1 analyse future developments in business process and technology application S2 determine requirements for processes related to ICT services S3 identify and analyse long term user/ customer needs S4 contribute to the development of ICT strategy and policy S5 contribute to the development of the business strategy				

MSIS 2016 postulates

i. It is worth to produce curricula recommendations.
ii. Entering an IS Master's degree program requires an appropriate Bachelor's degree.
iii. An IS Master's degree provides the competences needed for starting as an IS professional career.
iv. Existing ICT competences frameworks (e-CF, SFIA, …) are a good starting point for MSIS curricula development.

If you want to give your input to us

- Please send your contact information to ekarsten@abo.fi

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