



EUCIP
European Certification of
Informatics Professionals

Introduction to the EUCIP Elective Level

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1 Introduction

This document is intended to give an overview of EUCIP Elective level, assuming that the reader is familiar with the general structure of EUCIP. The primary target audience consists of candidates to the EUCIP Professional certification.

1.1 – Goals of the EUCIP professional certification programme

EUCIP is a general certification scheme encompassing several different professional competences in informatics. Candidates for certification are individuals, who can be either new entrants to the sector (students or experienced people from other industries) or experienced ICT professionals wishing to achieve independent and international recognition of their competences. A university degree is not a pre-requisite for this.

EUCIP *core level certificate* can be seen as a “passport” to further specialisations as real ICT professionals, while the *elective level certificate* indicates proficiency in specific areas.

EUCIP elective profiles are suitable both for job roles in the ICT supply industry and for positions within the Information Systems department of any other sector.

Although some elements are internal to the EUCIP scheme (i.e. the 3 Core modules and all modules of the IT Administrator specialism), EUCIP is based on an “open” model, aiming to define cross-references between a number of different elements, such as existing definitions of ICT job profiles, university courses, ICT vendor qualifications, independent courses and certifications. One of the main task of the EUCIP Working Group and EUCIP Strategy Group is to maintain central regulation of the accreditation of external training modules.

The EUCIP concept belongs to the Council of European Professional Informatics Societies (CEPIS), an independent and not-for-profit entity, and the ECDL Foundation is in charge of operating the certification programme.

1.2 – Meaning of the “elective level”

The EUCIP overall qualifications model shows a core level of certification that must be obtained by everyone wishing to progress onto the higher EUCIP scheme. The core level requires a *broad knowledge of fundamental aspects* of informatics; however, the elective level is meant to represent a *specialised competence* that a candidate earns working through a variety of educational modules and by gaining practical experience. The number of different specialisms within ICT-related jobs can be huge, and various different skills classification models are in existence already. The main goal of the EUCIP elective level is to provide candidates and learning providers with:

- a choice of different knowledge and skills profiles (“elective profiles”);
- a choice of accredited learning elements (“elective modules”);
- guidelines on how to build up a specific competence that will enable the ICT professional to act effectively in a professional role at a consistent and standard specialisation level.

1.3 – Vocational structure

Each EUCIP elective profile is intended for a range of actual job profiles. A complete classification of all job titles, levels and roles is not in the current scope of the EUCIP programme.

Nevertheless, a few criteria have been identified within EUCIP to compare and match different ways of defining profiles, including those that were used as sources for the EUCIP elective level documents:

- the Industry Structure Model[®] release 3.3, kindly made available to EUCIP by the British Computer Society,
- the Skills Framework for the Information Age[®] (SFIA) by the British SFIA Foundation,
- AITTS, the advanced IT training and certification system based on work processes (“Arbeits-Prozess-Orientierung”) promoted by the German Federal Government,
- the Nomenclature of ICT occupations by CIGREF, the club for informatics of large French enterprises,
- the results of the Career Space[®] project carried out by a consortium of nine major ICT companies and supported by the European Commission,
- the CEN/ISSS Workshop on ICT Skills (N05-019), and its phase 2 final CWA report on “European ICT-Skills Meta Framework”,
- other **internal** certifications proposed by CEPIS, such as the ECDL[®] and the IT Administrator programme, or by member societies, such as ISEB from the BCS[®],
- the qualifications proposed by **ICT vendors** or by independent organisations (e.g. EXIN in the Netherlands).

A final complete structure of IT skills and careers will be identified as a result of European efforts to harmonise different schemes into one standard framework; Appendix C lists the currently proposed EUCIP profiles and expected developments. Continuous revision and improvement of the whole framework is needed, in order to keep profiles up to date both in terms of relevance and usefulness to the needs of the job market, and in terms of knowledge and skills content that can be acquired through the various accredited courses. As a consequence, certification achieved more than three years earlier could prove to be no longer up-to-date.

2 Elective profile description

2.1 – EUCIP elective profiles

A EUCIP elective profile describes a combination of competences at the elective level; considering that the EUCIP Core Syllabus implicitly defines a classification of IT expertise, each elective profile can be “mapped” onto the Core areas and categories; e.g. the *Business Analyst* relates mainly to the *Plan* area, the *Software Developer* profile is linked to the *Build* area and the *Network Manager* profile to the *Operate* area. EUCIP elective profiles are defined and maintained in accordance with the projected needs of the IT employment market; the current set of profiles can be found in Appendix C.

2.2 – Structure of an elective profile

EUCIP describes each profile using the following terms:

- profile name and short description;
- tasks overview;
- essential behavioural skills;
- detailed skills required;
- sample learning modules;
- external references to SFIA skills and to profiles defined by AITTS and CIGREF.

The section regarding skills requirements is comparable to a high-level *syllabus*, and lists several categories and topics, as shown below.

Requirements are set at three different Levels	Deep, incisive or introductory , as explained in the following paragraph 2.3
Within each level, some Categories	A category is conceptually homogenous subject matter. Each level typically contains many categories (min 2, max 20).
Within each category, a number of Topics	A topic is a detailed element of competence described through a verb.

Table 1. Structure for specifying Skills Required

Each category at the elective level is identified through a code that indicates the Core level category on which it is primarily based: e.g. category “A5.01 – Project Management Essentials” used for some elective profiles is obviously linked to the Core category “A5 – Project Management”.

2.3 – Levels of “depth”

The ISM[®] structure from the BCS identified four levels of Knowledge & Skill through the following definitions:

- 1 **Aware**: the lowest level; for example a junior programmer may know about the PRINCE[®] method of project management, but not enough to create a project initiation document or a quality plan.
- 2 **Familiar**: competent to use the Knowledge & Skill element; for example, a C++ programmer can write fairly complex C++ programs, with minimal reference to manuals or expert advice.
- 3 **Proficient**: competent to use the Knowledge & Skill element and to advise and instruct others with confidence; for example, a PC support adviser will be able to provide detailed advice on the use and functionality of specific PC applications.
- 4 **Expert**: complete knowledge of all aspects of the Knowledge & Skill element; probably recognised as a source of definitive guidance, and solver of the most complex problems.

EUCIP identifies five levels of competence and experience that could be expected during learning phases and career progression within a role. These “depth” levels are used both to define the minimum requirements for each category in the Syllabus, and to evaluate candidates during examinations.

- 0 **extraneous** : almost no knowledge, scattered ideas;
- 1 **introductory** : some concepts, general scattering;
- 2 **incisive** : concepts reinforced by experience;
- 3 **deep** : sound competence and experience;
- 4 **major** : area of specialism.

Obviously, depth 0 is not a target level, and could only result in a negative evaluation of a candidate (on condition that the category/matter is applicable); depth 1 should be generally covered by EUCIP Core, whilst 2 and 3 apply to the specific categories defined at EUCIP elective level.

Depth level 4 is out of scope, since it is considered too high as a minimum requirement for a EUCIP candidate; again, this could result in an extremely positive evaluation of a candidate to highlight a very high level of experience in a certain specialist area.

For the purposes of EUCIP elective, a broad *introductory* knowledge is generally regarded as being covered by the Core Syllabus, so this is not addressed other than for completeness of definition. The two major levels used to specify minimum requirements are “incisive” and “deep”, as per the following examples:

- someone performing the role of Business Analyst is expected to be *incisive* in the category “IT Service Delivery”, and should be able to evaluate the various options for Service Desk support suggested by IT Service Management;
- someone taking on the role of Business Analyst is expected to have a *deep* competence in the category “Requirements Engineering”, and should be able to resolve overlapping requirements and prioritise them.

3 Matrix of elective modules

A matrix relates various skills profiles to existing modules and qualifications. Role profiles are used as column headings (to enhance readability, only one column is shown at a time); each row entry shows an item from the wide range of existing qualifications already mentioned (from Member Societies, from Universities, from ECDL, and from proprietary schemes such as Microsoft Certified Software Engineer, Oracle Certified DBA, etc).

The following table (and those attached to single profile specification documents) should only be considered as a sample used for a better understanding of the EUCIP elective level concept, since the full matrix includes many country-level modules.

EUCIP ACCREDITED COURSES (sample)		EUCIP ELECTIVE PROFILES (sample)	...	NETWORK MANAGER	...
E0000	EUCIP CORE				
E1001	A. Plan	X	X	X	
E2001	B. Build	X	X	X	
E3001	C. Operate	X	X	X	
E3100	EUCIP IT ADMINISTRATOR				
E3101	1. Hardware			D 2/8	
E3102	2. Operating Systems			B 4/4	
E3103	3. LAN & Network Services			C 5/5	
E3104	4. Network expert use			E 5/5	
E3105	5. IT Security			F 6/6	
E3106	6. Network Design			D 6/8	
I6101	ITIL Foundations (by EXIN or equivalent by ISEB)			A 2/2	
U1002	Univ. Information Systems			A 2/2	
U3001	Univ. Telecommunication Networks			E 5/5	
U3002	Univ. Operating Systems			C 5/5	
U3003	Univ. IT Security			F 6/6	
V1100	Cisco Networking Academy				
V1112	CCNA1 + CCNA2			C 5/5 E 5/5	
V1134	CCNA3 + CCNA4			D 8/8	
V1003	Cisco Wireless LAN Support Specialist			D 2/8	
V2001	IT Essentials I			D 2/8	
V2002	IT Essentials II			C 5/5	
V3903	IBM AIX Admin			C 5/5	
V3905	IBM LPI L1			C 5/5	
V4021	Microsoft Certified Systems Engineer (MCSE)				
V4020	Microsoft Certified Systems Administrator (MCSA*)				
V4270	MS 70-270: Installing, Configuring, and Administering Microsoft Windows XP Professional			B 4/4	
V4290	MS 70-290: Managing and Maintaining a Microsoft Windows Server 2003 Environment			C 5/5	

V4291	<i>MS 70–291: Implementing, Managing, and Maintaining a Microsoft Windows Server 2003 Network Infrastructure</i>		E 5/5 F 4/6	
V4299	<i>MS 70-299: Implementing and Administering Security in a Microsoft Windows Server 2003 Network (or equivalent*)</i>		F 2/6	
V9014	Sun Certif. System Administrator for the Solaris OS		B 3/4 D 1/8	
V9044	Sun Certif. Network Administrator for the Solaris OS		D 4/8 E 5/5	
V9081	Sun Certif. Web Component Developer for J2EE		C 2/5	
V9301	Sun Certif. Security Administrator for the Solaris OS		F 4/6	

Remarks

- 1 The skills requirements for each profile are grouped into a few “blocks”; each of these blocks is identified by a letter (‘A’..‘F’ in the example shown above) and is associated with some EUCIP points.
- 2 Where an ‘X’ appears in the matrix, this implies a mandatory qualification that must be obtained in order to be eligible for the EUCIP professional qualification.
As a general rule that does not permit any local exception, all three modules constituting the EUCIP Core level are always mandatory for any elective profile.
- 3 In order to reach the maximum credits, a candidate should collect all points in each block: e.g. 2 points on block ‘A’ in the example; these 2 points can be achieved either through an ITIL Foundations Certificate or through an accredited university exam (this type of accreditation is intended at country level).
- 4 In some cases the candidate can reach full points by taking more than one module per block: e.g. block ‘D’ corresponds to 8 points, which can be gained either through a single CCNA exam, or through exams 1 and 6 in the IT Administrator series, or through other combinations of modules (each of which gives a partial coverage of block ‘D’).
- 5 Behavioural skills elements are not easy to accommodate as deterministic outputs of a traditional training environment; as a consequence, candidates are not expected to achieve the total learning time (32 EUCIP points) through structured courses and accredited modules. The EUCIP elective level examination will therefore include a general assessment of those “soft” skills, as described later in this document.

4 Evaluation of a candidate's working experience

As previously stated in paragraph 1.1, EUCIP certification is both for new entrants to the ICT sector and for experienced professionals.

A typical example of the first case could be a young candidate coming from a technical university, who typically has a quite limited practical experience.

At the opposite end, a candidate having a non-IT study title (even at a low level) could apply for EUCIP certification after some years of practice in the IT sector.

The measurement of competences resulting from actual work is yet a difficult issue. The ECVET (European Credit transfer system for Vocational Education and Training) proposes a credit calculation based on:

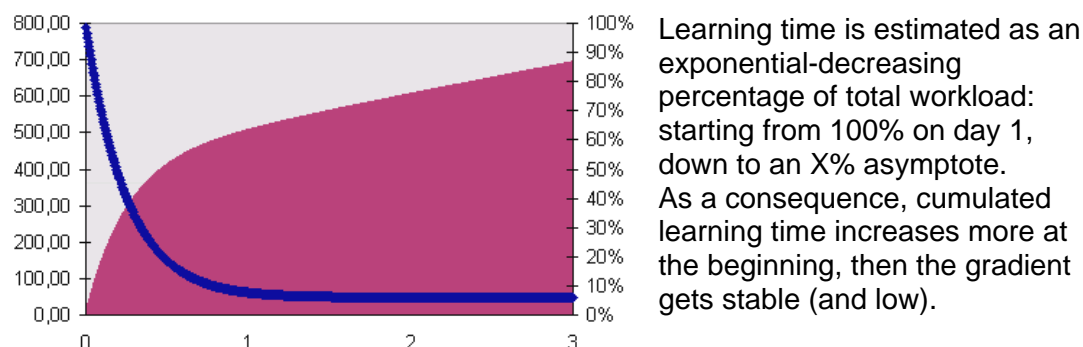
- workload
- notional learning time
- learning outcomes

In accordance with this approach, EUCIP requires each candidate applying for Professional certification to describe his/her personal work experience in terms of:

- **workload** (average net hours per day, total days in a job)
- context and specific tasks performed
- explicit training (courses), to be considered apart

The EUCIP organisation will then infer the applicable **learning outcomes** by measuring relevance to the EUCIP profile / categories of skills.

The "notional" **learning time** will be estimated as shown in the figure below.



AITTS – the Advanced IT Training System promoted by the German Federal Government – proposes an alternative approach to the assessment of working experience.

In this system, certification is based on:

- description of standard processes
- 3-party co-operation (worker, employer, certification entity)
- documentary evidence of processes/tasks performed, and consequent skills acquired

If a EUCIP candidate presents some documents validated by AITTS, they will be taken into account as EUCIP accredited elective modules, in proportion to their relevance to the selected EUCIP professional profile.

5 Gaining the professional certification

EUCIP Professional certification (i.e. certification at elective level) takes into account three fundamental dimensions:

- previous formal studies (i.e. courses giving a final study title), plus continuing education and professional development activities;
- previously achieved certifications;
- practical work experience.

EUCIP does not set a general minimum requirement on the first dimension (studies and related titles), but some thresholds are set on both other dimensions.

The minimum requirement about certifications is primarily achieved by credit accumulation, or - in other words - by gaining accredited qualification elements from local EUCIP Joining Societies or from suppliers such as Cisco, IBM, Microsoft, Oracle, Sun, etc.

Each module / qualification is valued up to 10 EUCIP points; the candidate is fit for the **final examination** after gaining 32 points (equivalent to the norm of 800 hours of study time and related practice) as prescribed by the EUCIP document that defines the profile chosen.

The examination process for the EUCIP Professional certification is based on two main elements:

1. the presentation of a **portfolio**, showing the (project) work that has been undertaken by the candidate and his/her curriculum vitae et studiorum with related certificates. All documents must be submitted in advance, in order to allow for their validation. Instructions on how to compile a portfolio are given in Appendix A;
2. an **oral examination**, consisting of a 20-30 minute discussion about the portfolio and a 20-30 minute evaluation of the candidate's knowledge and skills through questions on syllabus topics and on the general relationships between them.

The examining board shall consist of two or more senior members appointed by EUCIP and by the local Joining Society. A short introduction of the portfolio contents will provide the opportunity to evaluate the candidate's presentation skills, as well as his or her behavioural skills.

Once this process has been successfully completed, the candidate will be awarded the title *EUCIP Business Analyst*, or *EUCIP Software Developer*, or *EUCIP Network Manager*, etc.

If the candidate meets all requirements except a sufficient working experience, a reduced title can provisionally be awarded (e.g. **Associate Network Manager**): the candidate will then be allowed to apply for a certification upgrade a couple of years later, after having accrued the required practical experience, and will finally get the full EUCIP Professional title.

Appendix A : Composition of a Portfolio

The portfolio is meant to show the level of knowledge and skills achieved by the candidate either through real work or in a simulated work-environment.

The EUCIP examining board needs to examine *both theoretical and practical competence* as shown by the candidate's portfolio: therefore a proper and truthful record is vital for passing the EUCIP elective level examination.

The candidate shall not be admitted to the oral examination before the documents have been thoroughly reviewed and all queries dealt with. The candidate should be able to answer any detailed question about the work presented, since sample checking of the authenticity of portfolio contents will be performed very rigorously during the oral examination.

The portfolio must include the following elements:

- the candidate's curriculum vitae, in the standard European format (currently available at <http://europass.cedefop.eu.int>);
- a description of how the knowledge and skills requirements set by the EUCIP elective profile have been attained (i.e. which qualifications, examinations, courses and project experience have been selected to obtain the requested number of EUCIP points in each of the prescribed areas of competence);
- a copy of all relevant diplomas and certificates;
- a 20 page description of the most relevant work experience or "thesis-like" projects, with possible references and samples attached.

Areas that are required by the elective level syllabus and which are not addressed by the candidate's portfolio are more likely to be assessed in the second part of the oral examination (consisting of open questions and discussion).

Some standard forms will be available to the candidate for accurate preparation of the candidate's own portfolio.

The EUCIP organisation will submit to the examining board an internal report with marks gained in each module of the core level examination.

The validity of the EUCIP Core Certificate could be questioned if achieved more than 36 months earlier (i.e. the date of the third successful exam was more than three years before applying for the elective level examination). The examining board shall use its own discretion, on a case by case basis, taking into account the characteristics of the specific elective profile for which the candidate is applying and any relevant work experience gained in the meantime.

Appendix B : Rules for Candidate Evaluation

National EUCIP Joining Societies shall appoint examining boards and define a calendar for EUCIP Professional certification examinations. In accordance with the deadlines specified therein, interested candidates shall submit their personal portfolio. All documents will be checked by local EUCIP staff, who will request from candidates possible corrections and explanations if any ambiguity exists. Once the portfolio is accepted, the chairman of the examining board shall fill-in and sign an evaluation form associated with the candidate's portfolio. This first evaluation phase, based on submitted papers, will result in a preliminary appraisal that determines a minimum and a maximum score for each candidate.

Provided that final marks range from 0 to 100, and that 60 points is the minimum threshold for a positive result, the examination process could terminate with the first evaluation phase (if the maximum score from the portfolio is below 60, or other mandatory conditions are not fulfilled), or otherwise proceed with the second phase, i.e. the oral examination.

During the oral interview, the examining board shall further validate the portfolio and add some new evaluation elements, like the assessment of behavioural skills.

Just after the interview, the examining board shall make decisions on all open aspects (e.g. relevance of studies or work experience to the profile) and calculate final marks, that must be in the range of values determined in the first phase¹.

If the final score is below 60 then the candidate has not passed the examination, else two other cases exist: if the candidate's working experience complies with profile requirements, the full title is awarded (e.g. EUCIP Business Analyst), otherwise a provisional title is awarded (e.g. Junior Business Analyst) as previously explained. The score shall be communicated to the candidate, but not disclosed to the public.

The following rules define how EUCIP points must be calculated.

- Dimensions and general allocation of points:

1) study title + continuing education	0p..30p
2) EUCIP accredited modules + other certifications	28p..48p
3) work experience	2p..32p

Constraint: sum can not exceed 100p total.

1) Study Title, Continuing Education and Professional Development

There is no general minimum threshold on this dimension: a country-based threshold is recommended – where applicable – at a reasonably low level (e.g. 12-13 years in school); moreover, a “secondary school diploma” or equivalent title seems to be a legal requirement for starting apprenticeship in some countries.

In any case, the following rules apply:

- ICT relevance of studies at school 0p .. 8p
- quality of 3-year degree
and relevance to the EUCIP Elective Profile 0p..18p
- relevance/quality of additional 2-year studies 0p..12p
- further formal studies (e.g. PH.D.) 0p .. 6p
- continuing education and professional develop. 0p..12p

More specific rules should be set at country level.

Constraint: sum can not exceed 30p total on this dimension.

¹ the only one exception to this rule is when the examining board unanimously decides that the candidate is definitely not fit for the elective profile; in such a case, the final score may be set to 55 points even though the initial appraisal had given a minimum above 60 points.

2) EUCIP accredited Modules and other Certifications

The minimum requirement is the EUCIP Core certificate + at least 60% of elective level certification points (excluding points for behavioural skills).

The following rules apply:

- EUCIP Core 12p..20p
calculated as $20p \times \text{average_passmark [60\%..100\%]}$
- EUCIP Elective 16p..32p
elective modules, accredited either globally or locally, have fixed points;
other modules listed in the candidate's portfolio that have not yet been accredited can discretionally be summed [up to 32 total], on condition that:
 - I. the source is reliable and can be verified;
 - II. the assessment of skills is individual and rigorous;
 - III. the examining board determines a link between such skills and some categories in the elective profile that were not fully covered otherwise; the points given can not exceed the sum of points specified for relevant categories.

Constraint: sum can not exceed 48p total on this dimension.

3) Work Experience

The general minimum threshold on this dimension is 300 hours (i.e. 2 months full time equivalent) in a job related to the EUCIP profile; the combination between duration and relevance must give as a result at least 2 points as explained below. A higher and more specific minimum threshold for practical experience is specified for each elective profile; if this second requirement is not fulfilled, the EUCIP Professional certification can only be awarded on a provisional basis, thus allowing the candidate to enter the profession and to accrue the required practice.

In any case, when evaluating the candidate's curriculum the following rules apply:

- explicit training events during the working period can either be considered apart (especially when leading to a recognized qualification – see items 1 and 2 above) or be expressed as a percentage of working time and be accordingly treated in a formula.
- work periods must be separated when they lasted at least 6 months and
 - I. a “context change” occurred (new employer organisation) or
 - II. a sensible change in role occurred
- for each work period (in the right time sequence) the following elements must be extracted / calculated:
 - I. duration (number of calendar days, gross) and intensity (net working days per year)
 - II. workload (average working hrs x net working days)
 - III. standard learning time and inferred theoretical points, calculated through a spreadsheet that applies the concepts described at page 7
- for each work period a relevance factor [ranging from 1 to 7] must be decided by the examining board and multiplied by 10% of the theoretical points
- the sum of resulting points for all periods gives the total score on experience

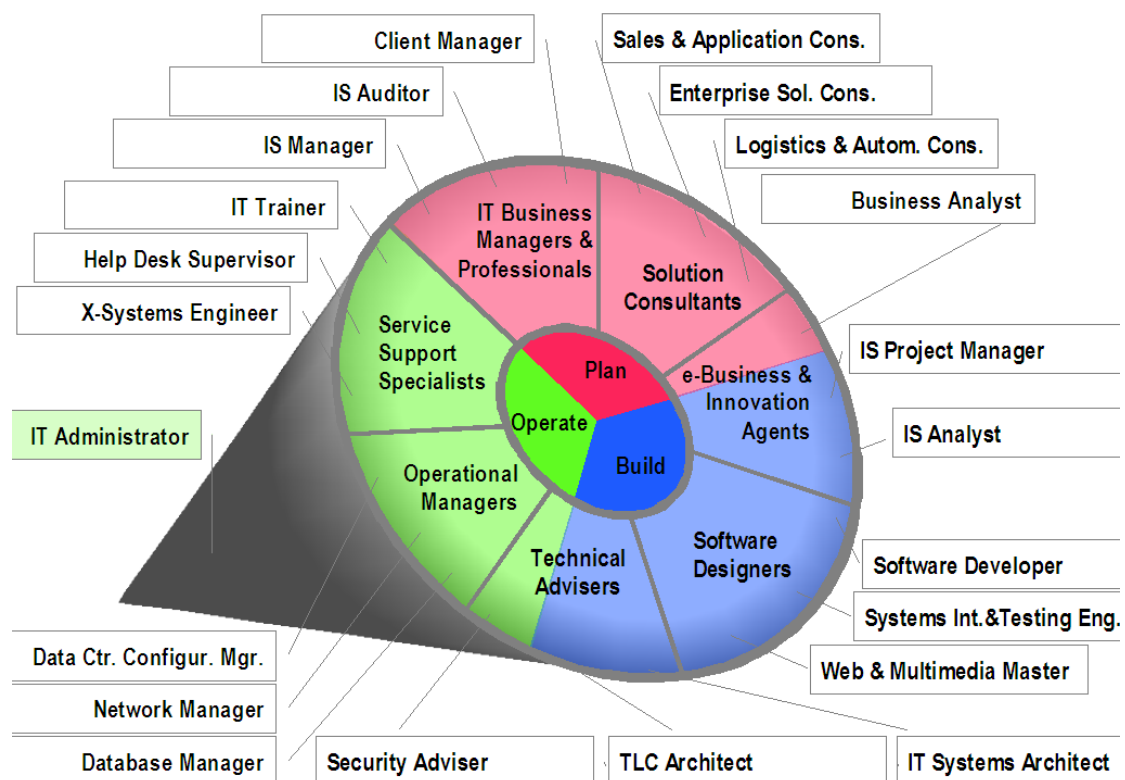
Constraint: sum can not exceed 32p total on this dimension.

Appendix C : EUCIP Profiles & Continuous Improvement

At present, 21 EUCIP Elective Profiles are available, plus a stand alone profile referring to the IT Administrator (operating in small organisational units, where a broad mix of operational competences is required from a single person).

The 21 elective level profiles can be grouped in 7 professional “branches” within the IT space, as shown in the following figure:

- IT Business Managers and Professionals
- Solution Consultants
- e-Business and Innovation Agents
- Software Designers
- Technical Advisers
- Operational Managers
- Service Support Specialists



The table below shows the current list of EUCIP elective profiles, briefly described. The year written in the first column indicates when the first version of a full specification document for the related profile was released.

The EUCIP Working Group, an international committee of experts and representatives of the CEPIS societies involved with this certification programme, will head a continuous quality review, improvement and update programme. A periodic review is in fact needed both for specification documents and for centrally accredited elective modules.

Rel. date	EUCIP Elective Profile	Short description	
2006	Information Systems Manager	An EUCIP Information Systems Manager is expected to have a broad competence both in ICT and in organisational issues related to an effective and efficient use of information in a business environment. Skills of planning and innovating must be combined with a steady service-oriented approach and the ability to react and solve practical problems using available resources.	(PLAN)
2007	Information Systems Auditor	A EUCIP Information Systems Auditor provides an independent assurance of security, quality, compliance and value contribution of information systems to a specific organisation (reporting to the highest corporate or board responsibility). An IS Auditor is expected to demonstrate sound technical competence, independence of opinion, compliance to the Code of Professional Ethic.	
2006	Enterprise Solutions Consultant	A EUCIP Enterprise Solutions Consultant is expected to combine business analysis skills with a specific effectiveness in customising and configuring the features of business software packages like CRM suites and the administrative modules of ERP systems. Professional consultancy skills and a general competence in the integration of enterprise applications are also vital.	
2004	Business Analyst	A EUCIP Business Analyst is expected to be very effective in understanding business cases, eliciting requirements, modelling business processes and identifying the appropriate type of ICT solutions. For this role, a high level professional attitude and the ability to communicate are as vital as a wide and thorough ICT competence.	
2006	Logistics & Automation Consultant	A EUCIP Logistics and Automation Consultant is expected to combine process analysis skills with a specific effectiveness in identifying and implementing IT solutions for industrial operations. This requires a thorough competence on CIM architectures, MES, packages for SCM and the logistic modules of ERP systems. Professional consultancy skills and a general competence in systems development are also vital.	
2007	Sales and Application Consultant	A EUCIP Sales and Application Consultant is expected to combine competence in a specific technology (context-dependent, e.g. CAD) with advanced marketing concepts and a general knowledge of typical client needs. Effectiveness in persuading when presenting solutions, practical demonstrations and commercial proposals is a must.	
2007	Client Manager	A EUCIP Client Manager is expected to combine a broad knowledge of ICT and information systems with advanced marketing, planning and account management concepts. Essential skills include the ability to negotiate and convince, as well as to monitor the quality of products and services provided to the client, either in single projects or in ongoing service contracts, up to ASP.	
2006	Information Systems Project Manager	A EUCIP Information Systems Project Manager is expected to be very effective in organising people and technical resources to achieve essential project goals in compliance with agreed constraints on quality, time and costs. This requires a specific competence in project management techniques (both in case of packaged solutions and custom development) and a broad knowledge of ICT and Information Systems.	
2006	IT Systems Architect	A EUCIP IT Systems Architect is expected to play a key role in designing performing and secure IT systems - with a special focus on software architectures - integrating and upgrading them; besides a thorough competence in ICT (all domains: software, hardware and networks), this requires specific design techniques and the ability to describe a system in terms of components and logical flows.	

2004	Information Systems Analyst	A EUCIP Information Systems Analyst is expected to be very effective in identifying requirements for ICT systems and defining models of information flows and business objects. A wide and thorough ICT competence has to be combined with the ability to interact with users and colleagues.	(BUILD)
2006	Web & Multimedia Master	A EUCIP Web & Multimedia Master is expected to combine design, development and administration skills for multimedia applications and websites; all aspects benefit from a thorough understanding of web systems and technologies, but creativity required for finding nice graphics and animation must be balanced by assessments on usability and accessibility, and a structured approach to publishing and administration.	
2006	Systems Integration & Testing Engineer	A EUCIP Systems Integration and Testing Engineer is expected to be very effective in several different areas of systems development: preparing end-user documentation, setting up IT systems, testing their functionality as a whole and as single component modules, identifying anomalies and diagnosing possible causes. Requirements include a specific knowledge on how interfaces between software modules are built.	
2004	Software Developer	A EUCIP Software Developer is expected to play a considerable technical role in information systems design and to be very effective in carrying out the creation and maintenance of complex software modules that typically need to be integrated into a wider information system. Different specialisations are possible, either in the field of applications and web services or in system-level software.	
2006	Database Manager	A EUCIP Database Manager is expected to play a key role both in designing data structures and in daily DB administration; therefore, skills requirements include a deep competence in all aspects of database technologies, a teamworking approach to project environments, proficiency in data modelling techniques, but also effectiveness in defining and applying procedures and organising routine operations.	
2006	X-Systems Engineer	A EUCIP X-Systems Engineer is expected to have a specific competence on various operating systems and related troubleshooting methods, performance tuning, system-level programming and cross-platform integration; diagnosing and problem solving attitudes are required in order to provide support both on proprietary and open systems, including hybrid configurations.	(OPERATE)
2006	Telecommunications Architect	A EUCIP Telecommunication Architect is expected to combine telecommunication skills with a specific effectiveness in identifying and implementing IT solutions for digital convergence. This requires a thorough competence on wireless digital communications over analogue media as on transfer of analogue signals over digital networks. Professional consultancy skills and a general competence in systems development are also important.	
2006	Security Adviser	A EUCIP Security Adviser is expected to be very effective in identifying security requirements for ICT systems and defining reliable and manageable solutions. A wide and thorough ICT competence has to be combined with the ability to interact with other ICT functions to foster the integration of security technologies within the ICT infrastructure.	
2004	Network Manager	A EUCIP Network Manager is expected to be very effective in managing a networked information system of medium complexity, and improving its performances. Should also be proficient in interactions with network architects and possible external suppliers across all phases of a network's lifecycle.	
2006	Data Centre & Configuration Manager	A EUCIP Data Centre and Configuration Manager is expected to have a structured approach to design, set-up and maintenance of an IT-enabled working environment, both in case of a development environment and in case of a "live" system for end-users; this requires specific competences on quality procedures and on workflow management systems and tools.	
2006	Help Desk Supervisor	A EUCIP Help Desk Supervisor is expected to be effective in providing technical support; this requires competence in a specific technology (context-dependent e.g. web services), but also familiarity with SLA contracts, awareness on client business operational priorities and on typical user issues, as well as a positive attitude to problem response and customer relations.	
2007	IT Trainer	A EUCIP IT Trainer is expected to be very effective in communicating IT concepts, training users and motivating them to make the most of IT systems; requirements include a broad ICT culture, a focus on a specific technology (context-dependent, e.g. groupware products), excellent presentation skills and proficiency in training techniques, including design and preparation of effective courseware.	