



**CEPIS**  
Council of European Professional  
Informatics Societies

# **CEPIS Survey of Professional e-Competence in Europe**

European Report



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## **Preface**

The *CEPIS Survey of Professional e-Competence in Europe* is a pan-European project undertaken by CEPIS together with national informatics associations that are CEPIS members. The purpose of this research is to produce and assess an up-to-date picture of the actual digital competences of IT professionals across Europe today, using profiles recognised by the labour market and analysing them based on the European e-Competence Framework. The survey has identified the e-competences of approximately 2000 IT professionals from 28 countries across Europe. Individual country reports have been created for those countries that reached 50 or more respondents and at least one cluster of a minimum of ten respondents with the same calculated profile.

The following should be noted with regard to the demographic of respondents from participating countries:

- The survey sample was dependent on the available contact database used to promote the survey in each country; there may be some variance between the membership of these contact databases and the full population of IT professionals in the respective countries.
- The sample composition may reflect the participation of the membership of participating CEPIS Member Societies.

These criteria apply to the data samples of all countries that took part in the survey. Any comparisons between national level results and the European average in this report should be considered as important insights as well as preliminary and qualitative indications which may require more extensive validation. Since the sample of respondents per profile and per country may not be considered statistically representative, the survey results are to be considered as qualitative. Each country level report<sup>1</sup> has been assessed and validated by national experts before publication and these expert contributions were also used as inputs into this European report.

The data gathered in this round of the CEPIS Survey of Professional e-Competence in Europe prove a high level of interest from professionals in reflecting about their own e-competences and their profile. From the qualitative point of view, the results facilitate interesting observations on the subject of e-competences and professional profiles. CEPIS and CEPIS Member Societies see the value of further research, to generate a higher statistical representation of national communities of IT professionals.

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<sup>1</sup> See <http://www.cepis.org/professionalecompetence>



## **Executive Summary**

Identifying and analysing the e-competences of IT professionals across Europe can enable European employers, industry (including SMEs and entrepreneurs), policymakers, and educators to develop and implement a vision to manage the mismatches and shortfalls that threaten Europe's competitiveness and productivity and better match the skills of our labour market to what future jobs will require. Knowing the e-competences of contemporary European IT professionals will enable us to tackle these shortfalls, anticipate the effects in the short and long-term and mitigate the fallout.

The Council of European Professional Informatics Societies (CEPIS) is the European network of informatics professionals with 36 national informatics associations as its members in 33 countries across greater Europe. CEPIS, with the essential support of national professional IT societies (CEPIS Member Societies) has undertaken this pioneering research to produce and assess an up-to-date picture of the actual e-competences of IT professionals across Europe today. The CEPIS Professional e-Competence Survey has identified the e-competences of almost 2000 IT professionals in 28 countries across greater Europe. Ten individual country reports have been produced and one European report aggregating all respondents.

The research was carried out using an online assessment tool. The tool is based on the European e-Competence Framework<sup>2</sup> (e-CF). A set of 18 IT career profiles recognised by the labour market, and 44 enhanced e-competences derived from the e-CF, formed the pillars of the assessment tool. Where necessary, some of the 36 core e-competences of the e-CF have been split, creating 44 in total.

The e-CF was created by the CEN (European Committee for Standardization) Workshop on ICT Skills<sup>3</sup>, and is supported by the European Commission. It is a reference framework of ICT competences that can be used and understood by ICT user and supply companies, IT practitioners, managers and HR departments, the public sector, educational and social partners across Europe.

Survey participants, who were IT professionals from greater Europe, provided information on various topics including gender, age, their e-competences, educational background, their proficiency level in each of the five e-CF areas (Plan, Build, Run, Enable, Manage), as well as their current career profile. This information was used as the basis for country level reports and this European report. Country reports were produced for those countries that reached 50 respondents or more, and where at least ten respondents belonged to the same career profile. A Personal Report was automatically generated at the end of the survey for each respondent. This report provides an analysis of the individual's own e-competences and how they rate against the e-competences (based on the e-CF) required for a specific career profile. It provides an indication of e-competence gaps, and indicates where an individual has a surplus of e-competence for their chosen profile. The e-competence

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<sup>2</sup> <http://www.ecompetences.eu>

<sup>3</sup> <http://www.cen.eu/cen/Sectors/Sectors/ISSS/Activity/Pages/WSICT-SKILLS.aspx>



gap analysis furnished by the Personal Report enables respondents to better identify their levels of e-competence compared to a recognised European framework, and to better assess the e-competences that may need improvement through training for example. It also enables respondents to identify the skills they might need to progress into a future IT role.

The feedback from approximately 2000 IT professionals in greater Europe shows that most respondents selected IT Manager as their career profile. The least popular choice from the 18 career profiles recognised by the labour market was IT Applications Consultant. Overall very few young IT professionals answered the survey, with less than one-fifth of all respondents being under 30 years of age. It seems that the predicted skills shortage of 70,000 practitioners every year by 2015<sup>4</sup> may be exacerbated by the fact that only 16% of all IT professionals who responded were female. The skills gap can only widen if more women and young people continue to move away from ICT careers.

The following recommendations have arisen from the research:

- The **young talent that Europe needs is lacking**. As Europe's IT professionals age, and the demand for skills increases, the flow of talent into the profession will not meet the need for qualified professionals. Less than 17% of professionals assessed were in the under 30 age bracket. To increase the supply of new IT professionals, coordinated action is needed between education providers, informatics associations and industry; and support is essential from governments and the European Commission. European e-Skills Week is a good first step to promote the profession but needs to be replicated and repeated with frequency to have impact.
- Low knowledge indexes in some areas, in particular for 'Enable' e-competences highlight the **importance of continuing professional development** for the profession and the need for it to be **targeted to existing and anticipated e-competence gaps**. Clusters identified as Innovation of Systems at Work, Productivity of Systems at Work and Management of Systems at Work provide a basis to analyse and develop these areas.
- **Career paths with defined training and education requirements are needed**. 47% of practising professionals surveyed stated that IT was not the main focus of their education. Almost a third of IT professionals have come from a non-IT background and a large number of respondents failed to match the e-competences needed for the jobs they declared.
- All countries urgently need to **redress the gender imbalance** and increase the participation of women in IT careers. Member States should provide fiscal incentives for companies to adopt gender equity as part of their organisational culture, hiring practices and career advancement programmes. Mentoring

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<sup>4</sup> <http://www.cepis.org/index.jsp?p=827&n=945>



programmes and awards that facilitate female participation are successful but not prevalent.

- The **European e-Competence Framework<sup>5</sup> (e-CF)** is a practical tool for **categorising & defining e-competences and should be continually developed and disseminated across Europe**. The results of this work may help the CEN Workshop on ICT Skills to further refine the profile.

Some additional findings included:

- The average age of the IT professional in Europe is 41 years; the range is from the youngest at 32 years who can be found in Latvia to the oldest of 45 in Finland.
- A large percentage of respondents work in large organisations and majority of IT professionals hold full-time employment.
- IT Manager was the most declared job profile, however only 8% of these match the e-competences needed for the role.
- Software Developer is the most popular proximity profile – i.e. the profile for which the most professionals matched the required e-competences.
- Only 21% had the e-competences to match their declared profile. In other words 79% may not have the breadth of e-competences required by their role.

The findings have provided useful indicators of the current e-competences and gaps in Europe. Overall a high level of education was displayed by IT professionals who responded to the survey, but in many cases the education was not sufficiently focused in IT. In addition the proficiency level of respondents was quite low overall in comparison to what was needed for each career profile. Analysing these results, CEPIS suggests that IT professionals could benefit from specified training paths relating to their lack of IT skills, in particular IT Managers.

CEPIS thanks all informatics societies who participated and supported this research project, and all the IT professionals who contributed to the success of the project. This research would not have been possible without the contributions of informatics societies and their members.

The survey results, as portrayed in the country reports<sup>6</sup>, and aggregated in the European report, provide an up-to-date picture of actual digital competences of IT professionals. For job seekers, policy makers, professionals, industry, educators and any other interested parties we hope this research provides some thought provoking insights about the status of IT professionals in Europe today.

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<sup>5</sup> <http://www.ecompetences.eu>

<sup>6</sup> See <http://www.cepis.org/professionalecompetence>



## 1 Introduction

This report outlines the results of a pan-European survey to identify the digital competencies held by European IT professionals. The research offered a unique opportunity to explore the status of professional e-competence in Europe through an online tool that provided the individual respondents with a snapshot of their e-competences against an agreed European framework (the [European e-Competence Framework](#)).

Individuals who participated in this survey were able to compare their e-competences against those required for typical IT job profiles throughout Europe, to help identify individual strengths and weaknesses, and to assist in determining training and professional development opportunities. Each respondent received an assessment report targeted to their e-competences and profile. In addition, the results provide an insight into the national level status of professional competences in various countries in Europe. The ability to pinpoint which competencies are underdeveloped in a country can assist in developing focused training to further educate the workforce. Comparing and contrasting different countries' results also provides a useful e-competence benchmarking tool for each individual country.

The research was conducted via a web questionnaire based on the European e-Competence Framework ([e-CF](#)), developed by the CEN (European Committee for Standardization) Workshop on ICT Skills and supported by the European Commission. This framework identifies 36 ICT competences all of which are used in this tool. The survey expert team, based on CEPIS' experiences in defining IT competences and profiles, identified 18 typical professional profiles recognised by the labour market and an expanded set of e-competences to describe such profiles. The increased set of 44 e-competences includes all 36 e-competences from the e-CF, five of which have been further split to allow for a more precise description of different technical contents. [Section 8.1](#) describes the additional segmentation in detail.

The project has been carried out by the Council of European Professional Informatics Societies (CEPIS) in association with its national computer societies (CEPIS Members) who led the research in their own countries.

The results and analysis presented herein are based on the sample of respondents.



## 2 Methodology and Survey Approach

The research was conducted across 28 countries in greater Europe using a web-based assessment tool.

Sixteen of the 28 participating countries had a total number of responses higher than 30 and from these, 10 had more than 50 respondents and a cluster of a minimum of 10 respondents with the same profile, the minimum amount required to create some elements of an individual country report.

Almost 2000 individuals, who consider themselves to be IT practitioners, completed the assessment, which is divided into three sections. The assessment is based on the enhanced European e-Competence Framework segmentation, which is described in section 8.1

The three sections of the tool are described below.

### 2.1 Personal Information

Each respondent enters personal information including education, employment status, organisation size, industry and selecting the IT profile which matches their current role.

The respondent chooses from the following common IT roles:

IT Manager	IT Project Manager	Database Manager
IT Quality Manager	IT System Analyst	Network Manager
IT Client Manager	Software Developer	IT Administrator
IT Sales and Marketing Consultant	Integration and Testing Engineer	IT Systems Engineer
IT Applications Consultant	IT Systems Architect	Service Support Manager
Business Analyst	IT Security Manager	IT Trainer

### 2.2 e-Competence Questionnaire

In the next phase the respondent completes the e-competence questionnaire. The questionnaire consists of 44 e-competences. For each e-competence the respondent selects their proficiency level choosing from “None”, “Basic”, “Intermediate” and “Advanced” options. Additional information is also available for each e-competence to assist the respondent in choosing an appropriate level:



A-Plan		None	Basic	Intermediate	Advanced
<b>A.1-IS and Business Strategy Alignment</b> 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.		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>A.2-Service Level Management</b> Defines, validates and makes applicable service level agreements (SLA) and underpinning contracts for services offered. Negotiates		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>A.1 - IS and Business Strategy Alignment</b> 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.		<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<b>Knowledge</b> <ul style="list-style-type: none"> <li>business strategy concepts</li> <li>trends and implications of ICT internal or external developments for own organisation</li> <li>the potential and opportunities of relevant business models</li> <li>the business aims and organisational objectives</li> <li>the issues and implications of sourcing models</li> </ul>	<b>Skill</b> <ul style="list-style-type: none"> <li>analyse future developments in business process and technology application</li> <li>determine requirements for processes related to ICT services</li> <li>identify and analyses long term user/customer needs</li> <li>contribute to the development of ICT strategy and policy</li> <li>contribute to the development of the business strategy</li> </ul>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<b>A.6-Application Design</b> Defines the most suitable ICT solutions in accordance with ICT policy and user/customer needs. Accurately estimates development, installation and maintenance of application costs. Selects appropriate technical options for solution design, optimising the balance between cost and quality. Identifies a common reference framework to validate the models with representative users.		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>A.7-Technology Watching</b> Explores latest IT technological developments to establish understanding of evolving technologies. Devises innovative solutions for integration of new technology into existing products, applications or services or for the creation of new solutions.		<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<b>A.8-Sustainable development</b> Estimates the impact of ICT solutions in terms of eco responsibilities including energy consumption. Advises business and ICT stakeholders on sustainable alternatives that are consistent with the business strategy. Applies an ICT purchasing and sales policy which fulfils ecoresponsibilities.		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 2.3 Criteria for Inclusion

In order to ensure that the volume and quality of responses were suitable for country level analysis, baseline criteria were set and applied to the 28 participating countries.

The following criteria were adopted as the baseline for analysis:

1. An e-competence profile per country is analysed when there are 10 or more valid questionnaires completed.
2. A country profile would be generated if there are more than 50 valid questionnaires completed and at least one e-competence profile with 10 or more valid cases<sup>7</sup>.

On completion of this round of the survey, the following countries met these criteria:

Belgium	Finland	Latvia	Romania
Bosnia-Herzegovina	Ireland	Malta	Spain
Italy*	Norway*		

*\*Italy and Norway participated in the survey, but data from these countries was collected using a separate tool which was already in use locally. The function of the tools were exactly the same, but some differences exist in terms of demographic data collected and – especially – in terms of granularity of e-competences described in the questionnaire. The Italian-Norwegian tool used a self-assessment against 156 categories instead of 44 e-CF based e-competences. The research team carried out a separate analysis task to map the Italian and Norwegian results to the results gained from the e-CF based survey.*

In order to convert the data collected through the Italian-Norwegian tool for use for this survey, the following steps were taken:

1. Cross references identified between slightly different ways of collecting personal information in the preliminary stages of the questionnaire.

<sup>7</sup> See <http://www.cepis.org/professionalecompetence> for individual country reports



2. Cross references between profiles – 13 profiles map one to one, the remaining five survey profiles were expressed as a combination of two different profiles.
3. Expert checks on the compatibility of metrics used in both tools; each profile is described through an array of weighting factors that indicate the relevance of each e-competence to the single profile, but the consistency between the different descriptions was maintained to a high standard.
4. Identification of an optimized and controlled algorithm that minimizes the maximum distance between calculated proximity scores in both questionnaires<sup>8</sup>.

## 2.4 Personal Results

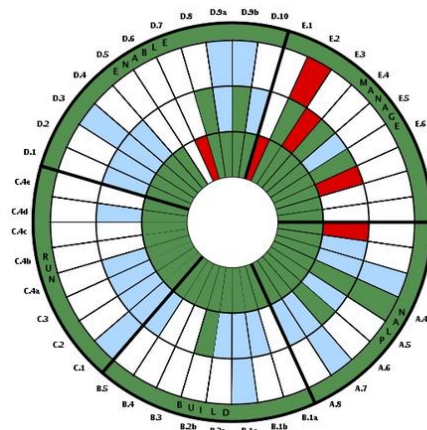
On completion of the survey, the respondent is presented with their personal results.

The personal result is displayed on a “radar” or “dart board”, split into segments (one for each e-competence) as illustrated in the image to the right.

The profile that is closest to the e-competences chosen by the respondent (their “proximity profile”) is shown along with a proximity index “88.56%” in this case.

Below the “dart board” is a list of the e-competences that the individual should look to develop, and e-competences which are held at levels over and above what is required for the profile.

The respondent can also review their proximity to the other profiles and export any of the reports in PDF format.



The chosen profile is “IT Project Manager” with a proximity index of **88.56%**

The graphics shows, in the spaces between the internal and the external circles, the average level of competence possession for the represented professional profile.

The green areas represent the competences required by the profile that you have.

The red areas represent the competences required by the profile to which you have a deficiency

The blue areas represent the competences that you have but that are not required by the profile.

Main competences to develop in order to better match with the “IT Project Manager” Professional Profile	
A.1. IS and Business Strategy Alignment	
E.7. Business Change Management	
E.2. Project and Portfolio Management	
E.3. Risk Management	
D.7. Sales Management	
E.1. Forecast Development	

Main competences which are possessed more in depth than how required by the “IT Project Manager” Professional Profile	
C.1. User Support	
B.1c. Design and Development (user interfaces)	
C.4d. Problem Management (database administration)	
B.2a. Systems Integration (configuration and performance control)	
C.2. Change Support	
A.7. Technology Watching	
B.1b. Design and Development (data model and application logics)	
A.3. Business Plan Development	
A.5. Architecture Design	
D.10. Information and Knowledge Management	
C.4a. Problem Management (process)	
D.3. Education and Training Provision	
B.5. Documentation Production	

<sup>8</sup> The algorithm is based on the simplex method for discrete linear optimization, constrained to four integer numbers. This scientific part of the work was carried out through a project associated with a university exam of “Optimization” at the SUPSI (*Scuola universitaria professionale della Svizzera italiana*, [www.supsi.ch](http://www.supsi.ch)); further details available in a dedicated document edited by Giovanni Franza to be published in “*biblioteca AICA*” (online library service for members of AICA, [www.aicanet.it](http://www.aicanet.it)).



### 3 Respondent Demographics

The following section provides an overview of the demographics of the respondents.

#### 3.1 Respondents by Country

The CEPIS Survey of Professional e-Competence in Europe was conducted from September 2010 until March 2011 across 28 countries in Europe and beyond. Overall 1918 IT practitioners participated in the survey. The percentage of participants by country is represented in figure 1 below.

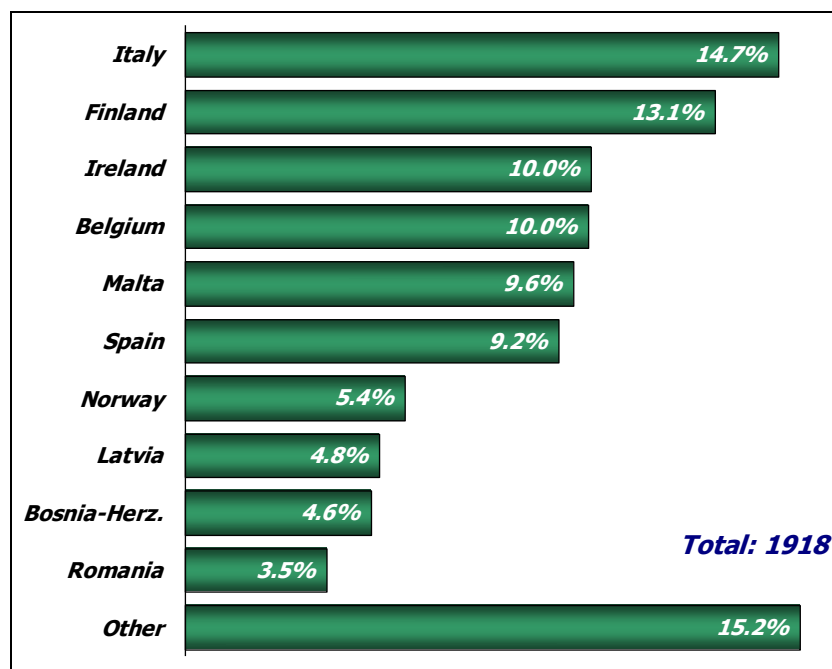


Figure 1 – Respondents by Country

Figure 2 below gives a more detailed view of the number of respondents by country and proximity profile. The three most popular proximity profiles were Software Developer (231), IT Administrator (165), and Service Support Manager (163). The three least popular proximity profiles were IT Client Manager (51), Business Analyst (45), and IT Applications Consultant (41).



	IT	FI	IE	BE	MT	ES	NO	LV	BA	RO	--	Total
	Italy	Finland	Ireland	Belgium	Malta	Spain	Norway	Latvia	Bosnia- Herzegovina	Romania	Others	
<b>P01</b> IT Manager		33	13	29	12	12	10					154
<b>P02</b> IT Quality Manager & Auditor		11		19	10							80
<b>P03</b> IT Client Manager												51
<b>P04</b> IT Sales & Mkt Consultant	10	10										52
<b>P05</b> IT Applications Consultant			12									41
<b>P06</b> Business Analyst												45
<b>P07</b> IT Project Manager	29	16	18	31								153
<b>P08</b> IT Systems Analyst	13	14	12		19	14		13				127
<b>P09</b> Software Developer	57	32	19	17	27	28	14					231
<b>P10</b> Integration & Testing Engineer				11	23	16				13		126
<b>P11</b> IT Systems Architect		18										85
<b>P12</b> IT Security Manager		10		13								60
<b>P13</b> Database Administrator	13	14										68
<b>P14</b> Network Manager	16											64
<b>P15</b> IT Administrator	55		16			15	13			11		165
<b>P16</b> IT Systems Engineer	37	11				10						96
<b>P17</b> Service Support Manager		23	34	16	25	19						163
<b>P18</b> IT Trainer		21	23	10	16	10		11	12			157
<b>Total</b>	<b>281</b>	<b>251</b>	<b>192</b>	<b>191</b>	<b>184</b>	<b>177</b>	<b>104</b>	<b>92</b>	<b>88</b>	<b>67</b>	<b>291</b>	<b>1918</b>

Figure 2 – Respondents by Country and Profile

Figure 3 below shows the details of the number of respondents for the “Other” participant countries, including those that did not reach the baseline number of cases for an analysis on a country level. These responses were also used for the general European analysis.

Responses to the survey were received from 28 countries; however we must note that 18 of those countries produced the majority of the responses and 10 countries reached the response threshold to allow for analysis of at least one profile with 10 respondents or more. Based on this information, these European results represent a factual analysis based on the respondents’ sample per country. The total responses obtained have been used to build an average European benchmark to compare data gathered per country, details of which can be found in the country level reports available on the CEPIS website<sup>9</sup>. CEPIS and CEPIS Member Societies acknowledge the value of further research in this field with the aim of increasing the number of respondents per country and facilitating a more detailed view of the status of professional e-competences in Europe.

<sup>9</sup> See <http://www.cepis.org/professionalecompetence>

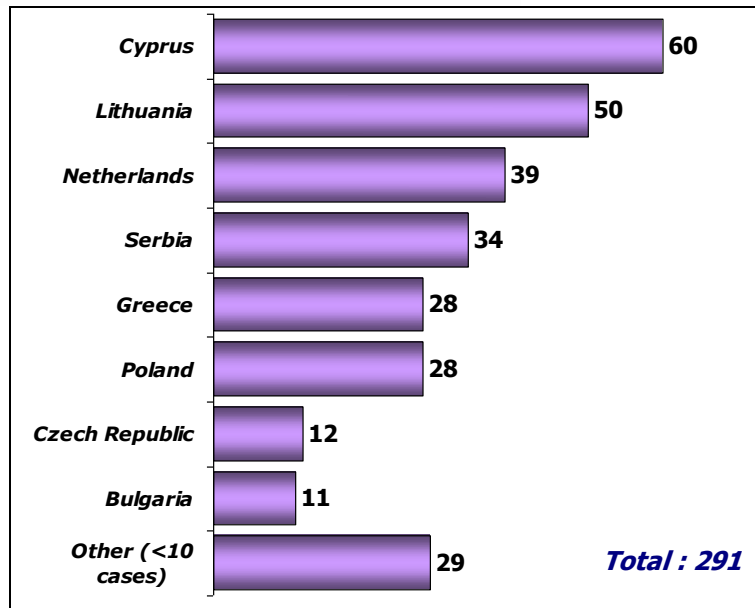


Figure 3 – Respondents from Other Countries

### 3.2 Respondents by Age

The respondents to the survey represented various age groups as highlighted in the figure below<sup>10</sup>.

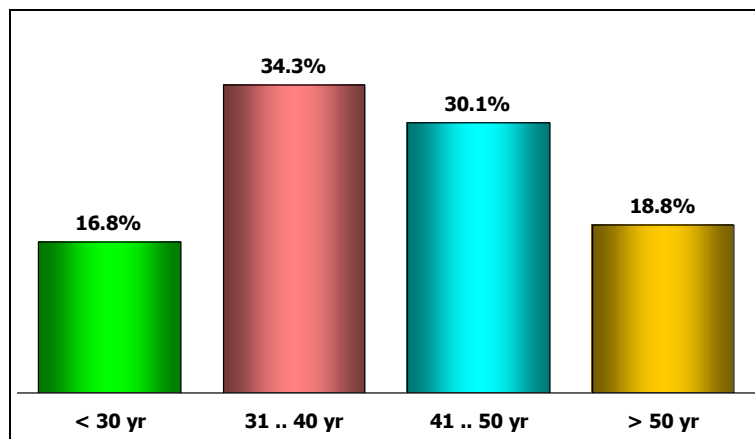


Figure 4 – Respondents by Age

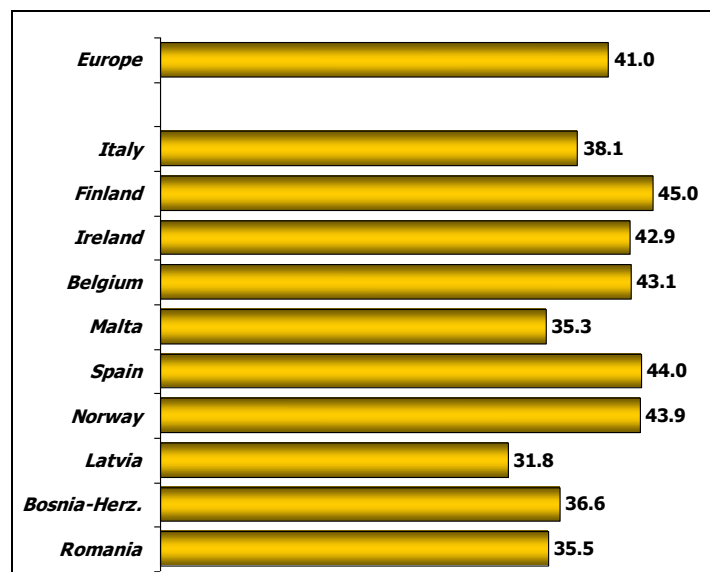
The average age of respondents in Europe is around 41 years old. The range for this variable (see table in [section 8.5.1](#)) is 13 years; from about 32 years old for respondents in Latvia to 45 years old for Finnish respondents.

The relatively small percentage of professionals in the under 30 age bracket suggests that there are still some issues with promoting the IT profession as a career

<sup>10</sup> Note: as “<24 yr” and “>60 yr” classes count for a low % of total assessments (about 3% each), they have been grouped into the adjacent class, as a result only four age classes are shown: “<30 yr”, “31-40 yr”, “41-40 yr”, “>50 yr”



in schools and universities and that the perception of IT as an attractive field to work in needs to be improved. This potential shortfall in young, suitably skilled employees could hamper the European knowledge economy and lead to losses in competitiveness and innovation. The low numbers of young IT professional respondents could be a symptom of the current economic climate in Europe, where youth unemployment levels are soaring, and many young people may have decided to prolong their education and to not enter the workforce until the economic situation improves<sup>11</sup>.



**Figure 5 – Respondents by Age and Country**

Regarding the average age by IT profile (see table in [section 8.5.2](#)) the range of variation is narrower: 8.4 years, from 38.3 years old for the Integration & Testing Engineer to 46.7 for IT Managers.

In addition to the Integration & Testing Engineer, the younger profiles are IT Administrator (38.3 years) and IT Systems Engineer (38.6 years), while the older profiles, apart from IT Manager, are Business Analyst (44.5 years) and Project Manager (43.5 years).

### **3.3 Respondents by Gender**

In Europe female IT professionals represent only one out of six respondents (see table in [section 8.5.1](#)); but the analysis at country level shows strong differences: the lowest rate noted is 8% (Italy) and the highest is 28% (Romania). This suggests that there is still a high degree of gender inequity regarding the representation of women in IT.

Over recent years CEPIS has worked in conjunction with the European Centre for Women and Technology (ECWT)<sup>12</sup> and other partners to ensure that women are encouraged to become a positive force and influence in the IT sector. CEPIS has

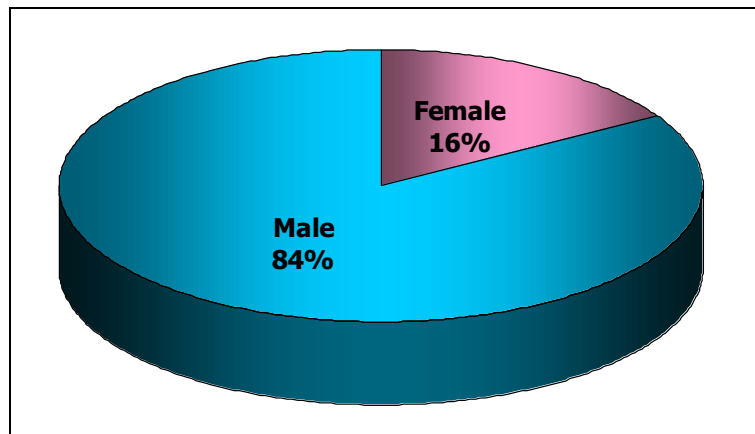
<sup>11</sup> [http://www.cedefop.europa.eu/EN/Files/8016\\_en.pdf](http://www.cedefop.europa.eu/EN/Files/8016_en.pdf)

<sup>12</sup> <http://www.womenandtechnology.eu>

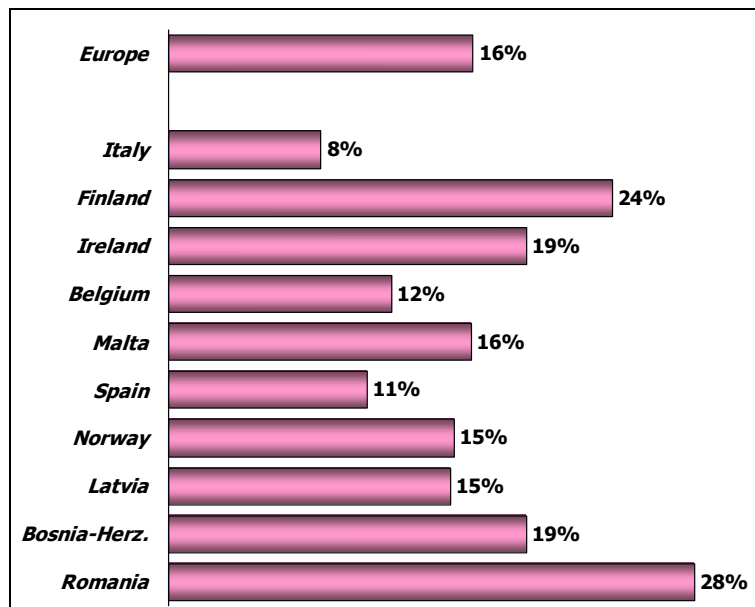


also awarded IT education grants to two of Europe's promising young women to help emphasise the need for more women in the IT sector<sup>13</sup>. In addition, the European Commission has previously organised "shadowing days" to give young women an insight into the potential benefits of a career in ICT<sup>14</sup>.

Further initiatives such as those highlighted above should continue to take place at a European level, within the education system and within IT companies to promote the IT profession among the European female population.



**Figure 6 – Respondents by Gender**



**Figure 7 – Respondents by Country and Female Presence**

The gender differences are even more pronounced (see table in [section 8.5.2](#)) for certain IT profiles such as IT Systems Engineer (only 5% are female), Database Administrator and Network Manager (6% each) for IT Trainer (41%), IT Quality

<sup>13</sup> <http://www.cepis.org/index.jsp?p=636&n=639&a=1982>

<sup>14</sup> [http://ec.europa.eu/information\\_society/activities/itgirls/index\\_en.htm](http://ec.europa.eu/information_society/activities/itgirls/index_en.htm)



Manager & Auditor (30%) and Integration & Testing Engineer (20%) have a higher female presence.

### 3.4 Respondents by Education Level

The respondents were asked to select the highest education level they had achieved. A large majority (79%) of the respondents have achieved at least a degree level qualification, showing the importance of third level qualifications in gaining employment in the IT sector (see table in section 8.5.1). Moreover, the investment in 4<sup>th</sup> level education is clearly visible with more than half of respondents (51.1%) having either a Masters or a PhD qualification. Due to the small sample of survey respondents, this average is higher than figures in a report by CEDEFOP but it is predicted here that the steady rise of highly educated adults over 25 years of age in the workforce will continue and reach 34% of the entire labour force by 2020<sup>15</sup>.

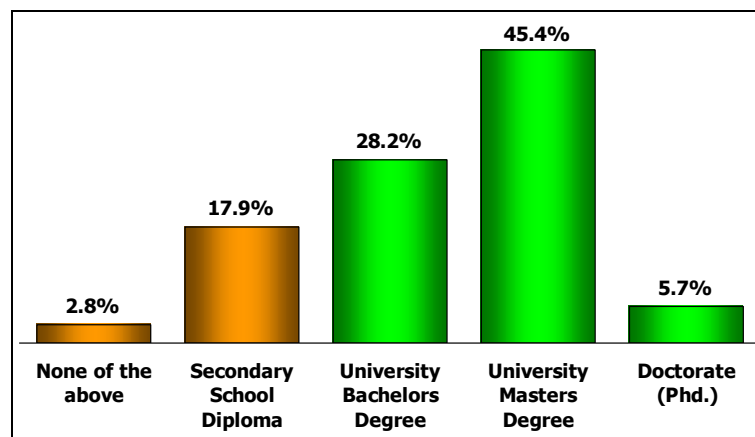
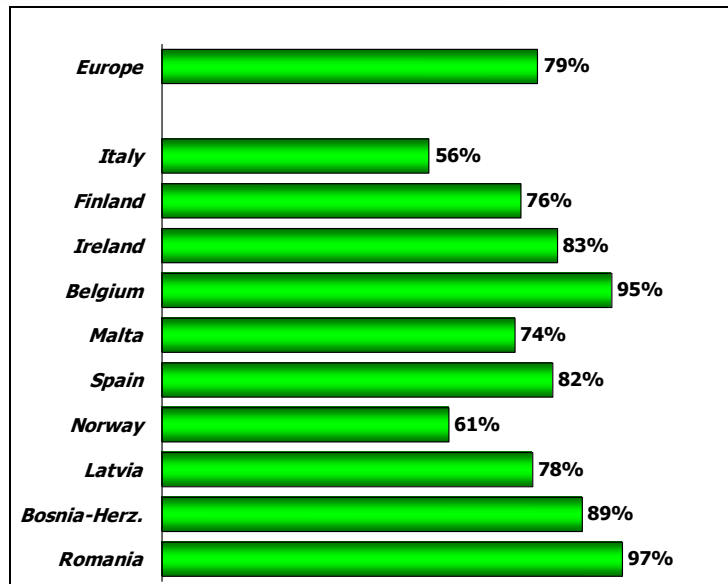


Figure 8 – Respondents by Education Level

The analysis of the highest education level attained shows that even in countries with the lowest rate (Italy: 56%; Norway: 61%) more than half of the respondents have a university degree. The highest numbers of respondents with at least a university degree were found in Belgium (95%) and Romania (97%).

<sup>15</sup> [http://www.cedefop.europa.eu/EN/Files/8016\\_en.pdf](http://www.cedefop.europa.eu/EN/Files/8016_en.pdf)



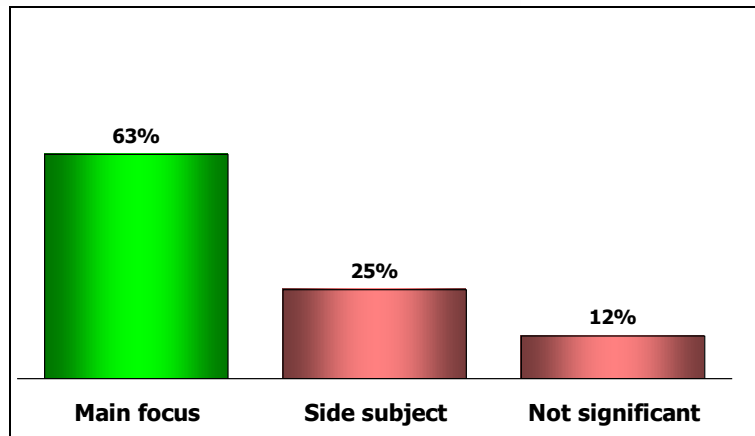
**Figure 9 – Respondents by Country and % with University Degree**

Even the education level of respondents across IT profiles (see table in section 8.5.2) shows a broad range of proportions: at the low end there are Client Managers (57% with a degree), IT Systems Engineers (63%) and IT Administrators (64%). At the high end we found IT Managers (93% with a degree), Business Analysts (91%) and IT Security Managers (90%).

### **3.5 Respondents by Educational Field**

The broad spread of educational backgrounds of IT practitioners points to the fact that the IT profession is accessible to graduates from different faculties. The ever-present demand for IT practitioners has led to IT roles being filled through the hiring and retraining of workers from non-informatics backgrounds. In Europe we can see that 37% of respondents come from an educational background where IT was a side subject or not significant in their studies. Within the IT sector in Europe one out of three IT professionals do not come from an educational background where IT is the main focus. This suggests that there may be some difficulties for companies to source candidates with IT qualifications for their advertised roles. The ***e-Skills Foresights - eSkills In Europe*** report<sup>16</sup> suggested that "...the ICT industry could be facing shortages of up to 70,000 IT practitioners per year in Europe, as supply falls short of demand". It is clear that the IT industry still does not only rely on IT practitioners from IT educational backgrounds to meet their needs.

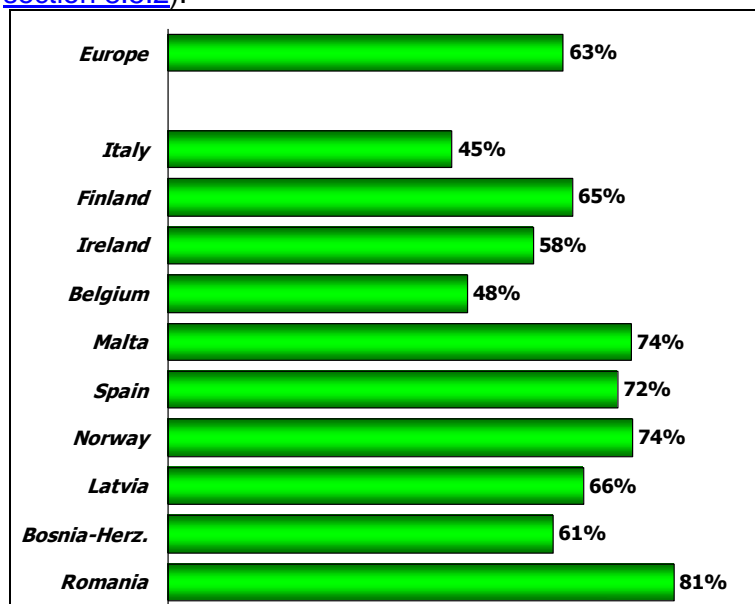
<sup>16</sup> <http://cepis.org/index.jsp?p=827&n=945>



**Figure 10 – Respondents by Educational Field**

The European average shows that only 63% of respondents hold a degree with IT as its main focus. In two of the surveyed countries (see table in [section 8.5.1](#)) we found a prevalence of non IT-focused education: in Italy (IT was the main focus in education for only 45% of respondents) and in Belgium (48%). On the opposite end there is Romania, where the rate of IT-focused education is 81%.

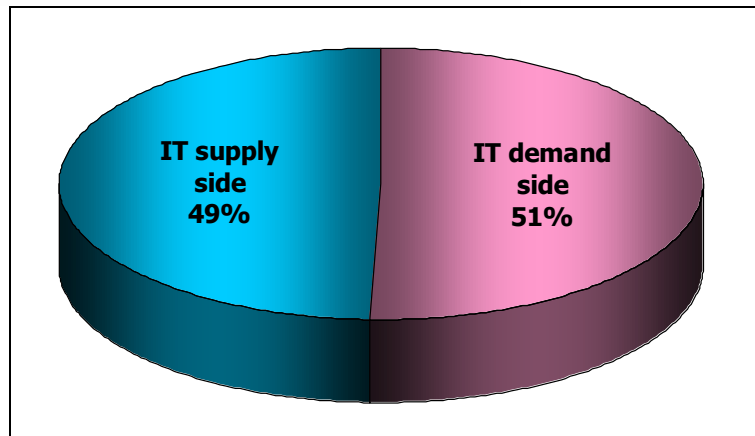
The rate of IT-focused education varies among certain IT profiles, with a low value of 48% for IT Managers, and 77% for Integration & Testing Engineers at the higher end (see table in [section 8.5.2](#)).



**Figure 11 – Respondents by Country and % of IT-focused Education**

### 3.6 Respondents by Industry Sector

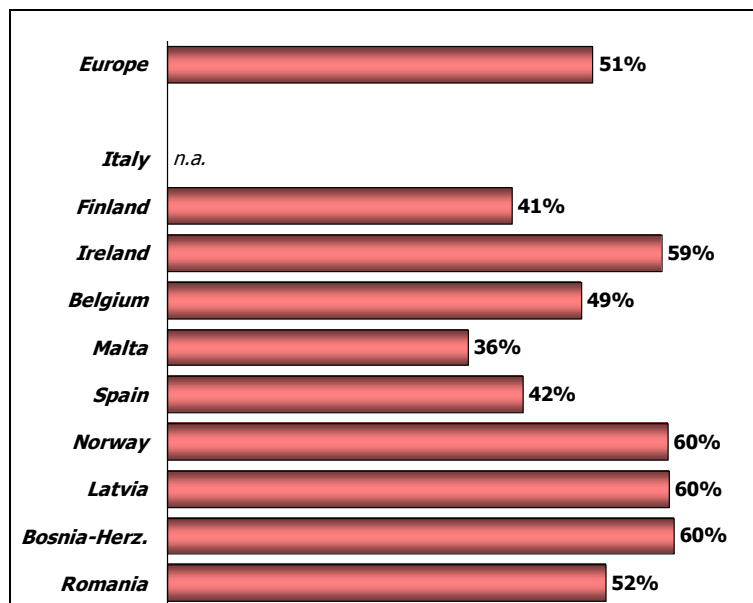
In Europe, IT professionals are equally split into the supply and demand side of the IT sector. 49% of respondents declared their focus was mainly on the IT supply side, while 51% came from the demand side.



**Figure 12 – Respondents by Industry Sector**

However this is not the same for each country: in fact in four countries the proportion of respondents belonging to the demand side is about 60% (Ireland, Norway, Latvia and Bosnia and Herzegovina), while for three countries (see table in [section 8.5.1](#)) there is a predominance of IT supply side responses with rates ranging from 58% to 64% (Malta, Finland and Spain).

Looking at the profile composition (see table in [section 8.5.2](#)) we found three profiles with a clear predominance of the IT demand side: IT Administrator, IT Security Manager and Integration & Testing Engineer (65%, 59% and 57% respectively), whereas there is a predominance of the IT supply side for IT Systems Analyst (56%), Database Administrator (58%) and Software Developer (60%).



**Figure 13 – Respondents by Country and % from IT Demand Side**

As already stated (see section 2.3), data from Italy has been collected using a different tool which was already in use locally: so this variable for Italy is not available.



### 3.7 Respondents by Enterprise Size

At European level, the distribution of respondents by enterprise size shows that large enterprises have the highest proportion (34%). However, given the sample size of the survey this proportion may not be fully reflective of the ratio of large enterprises across Europe. In Europe, previous research has stated that 99% of European companies are SMEs<sup>17</sup>.

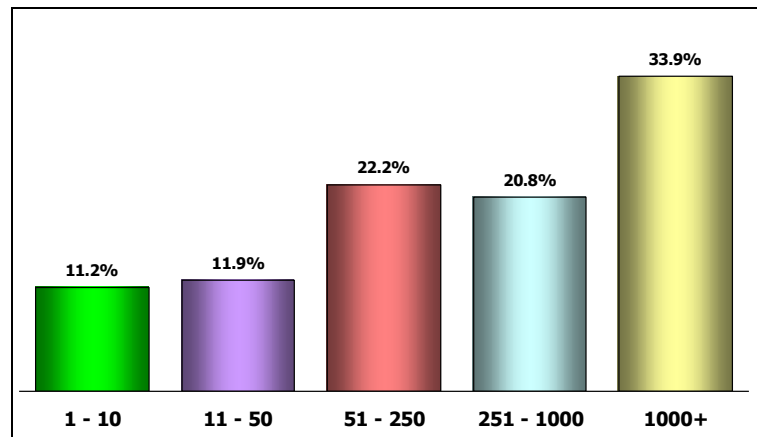


Figure 14 – Respondents by Enterprise Size

Figure 15 below highlights that Belgium is strongly oriented towards larger organisations with 72% of respondents in this size class. In contrast, the presence of large enterprises is very rare for Romania (2%) and Malta (10%).

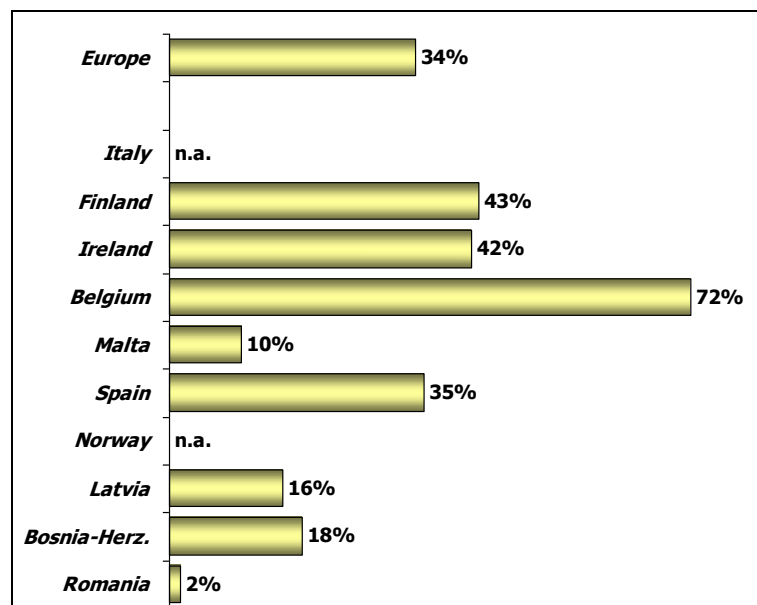
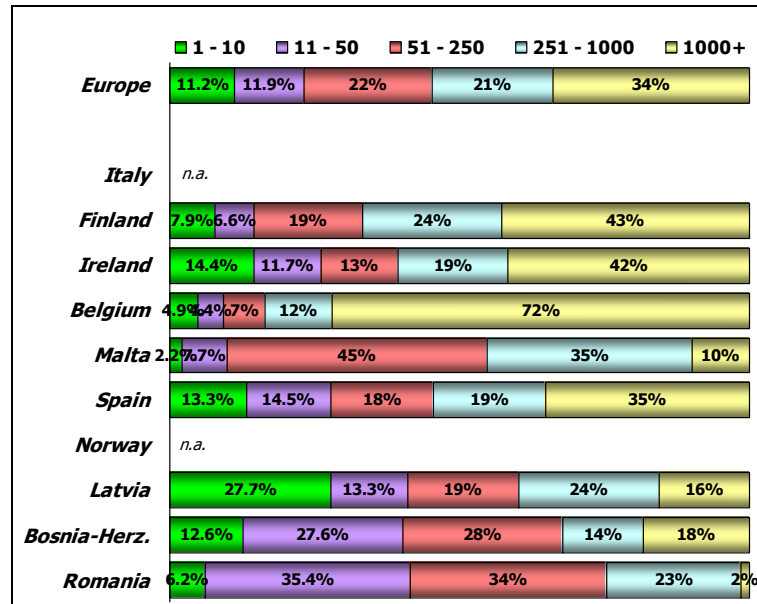


Figure 15 – Respondents by Country and % in Large (1000+) Enterprises

<sup>17</sup> [http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/index\\_en.htm](http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/index_en.htm)



As already stated (see [section 2.3](#)), data from Italy and Norway has been collected using a different tool which was already in use locally: so this variable is not available for Norway and Italy.



**Figure 4 – Respondents by Country and Enterprise Size**

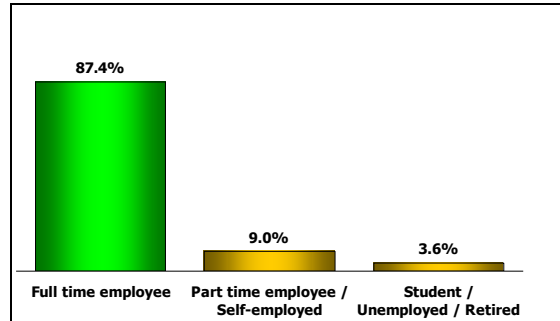
The analysis of distribution of respondents by size class (see table in [section 8.5.1](#)) suggests that Belgium and Finland seem to be, in general, countries that host larger organisations, while Romania and Latvia seem to host a greater number of smaller companies.

The analysis of IT profiles distribution by size class (see table in [section 8.5.2](#)) shows a smaller degree of variability. Some profiles are more frequently present in larger organisations, such as Business Analyst, IT Quality Manager and IT Manager. Others are more frequent in smaller enterprises, such as Client Manager and Sales and Marketing Consultant.

### 3.8 Respondents by Professional Status

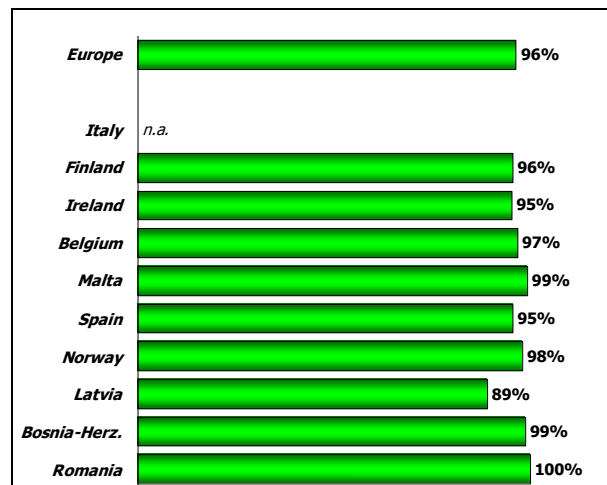
A large majority of European respondents hold full time positions<sup>18</sup> (87%) and this variable does not change very much among individual countries either. The lowest level was 89% in Latvia, and the highest level of 100% was found in Romania (see table in [section 8.5.1](#)).

<sup>18</sup> Note: as “Full time employee” choice counts for more than 85% of total assessments [this appears to conflict with the statement above], the other items were grouped as follows: “Part time employee / Self-employed” and “Student / Unemployed / Retired” [is this last part necessary?]



**Figure 17 – Respondents by Professional Status**

As already stated (see [section 2.3](#)), data from Italy has been collected using a different tool which was already in use locally: so this variable is not available for Italy.



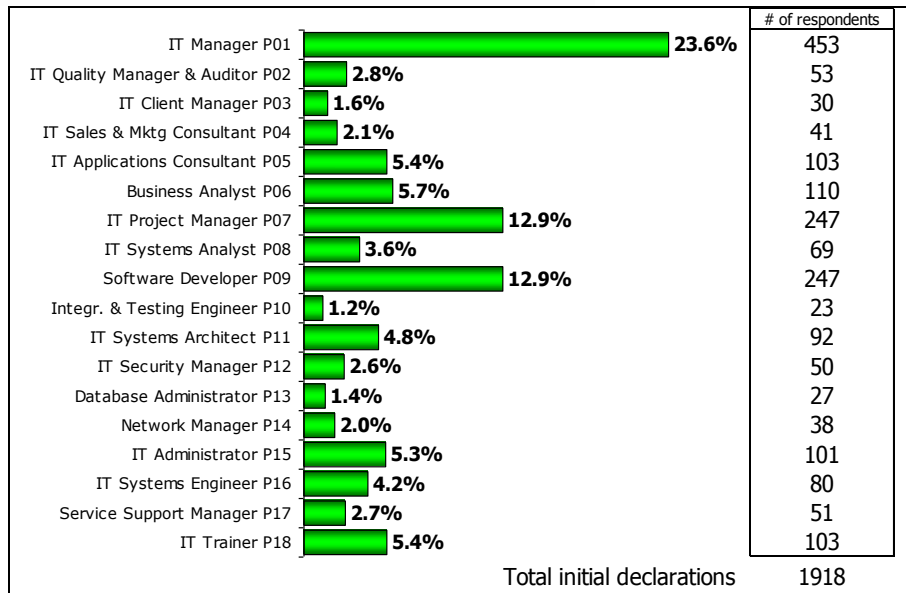
**Figure 18 – Respondents by Country and % with Full Time Position**

The IT Systems Engineer and Business Analyst (see table in [section 8.5.2](#)) profiles have the highest proportion of full time employees (93%), while the IT profiles with the lowest proportion of full timers are IT Project Manager (83%; 12% rate themselves as self-employed) and Client Manager (77%; 11% rate themselves self-employed and 9% rate themselves as part-time employees).

### **3.9 Respondents by ICT Profile (based on declared profile)**

Figure 19 below shows the distribution of IT profiles chosen by the respondents during registration (before starting the assessment). This subjective point of view is based on their gained experience and the actual work role they are doing. It differs from “Proximity Profile” as explained in [section 4.1](#).

All 18 IT profiles from which the respondents were asked to choose their role (during the registration phase) had some level of response.



**Figure 19 – Respondents by ICT Profile**

The IT Manager profile was the most chosen profile across seven countries, with a huge proportion in Norway (61% of respondents chosen this role); the other countries are Belgium 35%, Spain 26%, Ireland 25%, Italy 24%, Finland 17% and Bosnia and Herzegovina 15%. With regard to the remaining three countries, the most frequently declared profile was Software Developer: 32% in Malta, 21% in Latvia and Romania. Other profiles with a relevant rate of declaration (that is 15% or more) are:

- Software Developer (in Italy declared by 20% of respondents)
- IT Project Manager (in Italy declared by 18% of respondents, in Ireland by 16% and in Spain by 15%)
- IT Systems Engineer (in Romania declared by 18% of respondents)
- IT Manager (in Malta declared by 15% of respondents)



## 4 Proximity Profiles and Skills Evaluation

Each respondent evaluates their competence against the 44 e-competences provided, using the following scale:

**None:** none or almost no knowledge of the topic, confused ideas

**Basic:** knowledge of major concepts, but not exhaustive

**Medium:** knowledge of concepts and applicative capability, some direct experiences

**High:** in-depth and thorough knowledge of concepts and applicative capability with comprehensive experience in a complex context

A Knowledge Index (KI) has been computed for each e-competence, using a scale of 0 to 3:

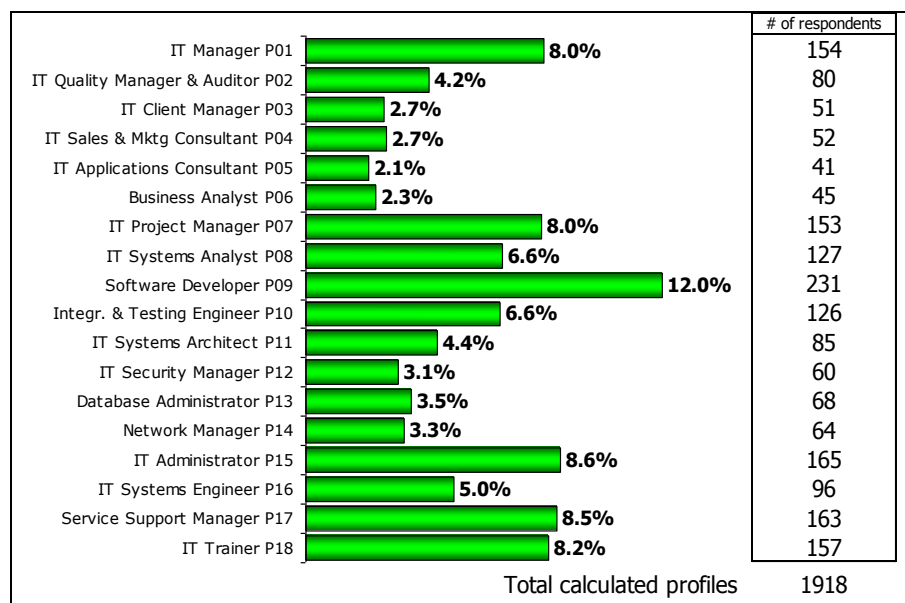
$$KI = \frac{(\# \text{ of answers "none"} * 0 + \# \text{ of answers "basic"} * 1 + \# \text{ of answers "medium"} * 2 + \# \text{ of answers "high"} * 3)}{(\# \text{ of answers})}$$

The proximity profile for each respondent is the profile that best fits with the e-competences that the respondent has declared. The proximity is represented as a percentage.

The Knowledge Index will allow us to carry out further analysis of levels of proficiency against the five e-competence areas defined in the e-CF as well as analysing the performance of respondents by country against a European benchmark and also for each of the profiles.

### 4.1 Respondents by Proximity Profile

Based on the outcome of the calculated proximity profiles we can see what IT profiles emerge from the e-competences declared by the respondents.



**Figure 20 – Respondents by Proximity Profile**



The analysis shows that in Europe, Software Developer is the role where most of the respondents have the required competencies; Italy (20%), Spain (16%) and Malta (15%). In other countries where at least 15% of respondents had the required competencies for other roles are listed below:

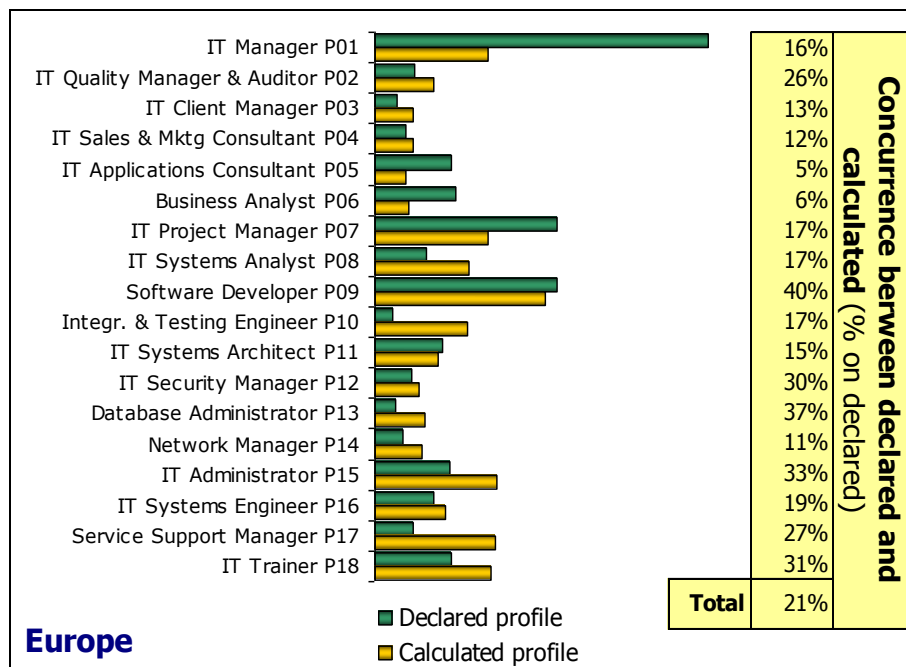
- IT Administrator (20% in Italy and 16% in Romania)
- Integration & Testing Engineer (19% in Romania)
- Service Support Manager (18% in Ireland)
- IT Project Manager (16% in Belgium)
- IT Systems Engineer (18% in Romania)
- IT Manager (15% in Belgium)

In a further four countries the distribution of the most common calculated profile is the following:

- IT Systems Analyst (14% in Latvia)
- IT Trainer (14% in Bosnia-Herzegovina)
- IT Manager (13% in Finland)
- Software Developer (13% in Norway)

#### 4.2 Comparison between Professional Profile and Proximity Profile

The analysis of the original profile selection made by the IT practitioners and the proximity profile i.e. the profile that best fits with the e-competences that he/she has declared shows a large variance for many of the profiles.



**Figure 21 – Comparison between Chosen (declared) Professional Profile and Proximity Profile (calculated)**

In general, the difference between the declared and the calculated professional profile highlights the importance of the level of e-competence granularity to build up each profile. The difference between the calculated and the declared profile may be



partly due to a respondent's motivation in selecting a career profile from the 18 profiles provided; this might be influenced by the following factors for example:

- The respondent's perception of their current career (at the time of taking the survey)
- How satisfied/dissatisfied they are with their current job.
- The manner in which their career profile is defined in the company/organisation.
- How the defined profiles are recognised in the national labour market (by salary etc.) or by the territory in which work experience has been carried out.
- The respondent's own preference for a particular IT career irrespective of whether they even have the right e-competences/experience for that profile at the time of taking the survey e.g. a respondent who is seeking a new career direction.

In contrast, the calculated profile is generated independently of subjective values. The algorithm used relates to the responses on the levels of e-competence held (item by item) and then produces the calculated profile. The level of granularity of questions/responses allow for the profiles to be differentiated independently from the respondents' own perceptions of the declared career profiles.

Interestingly, only 21% of the initially declared profiles matched their calculated profile.

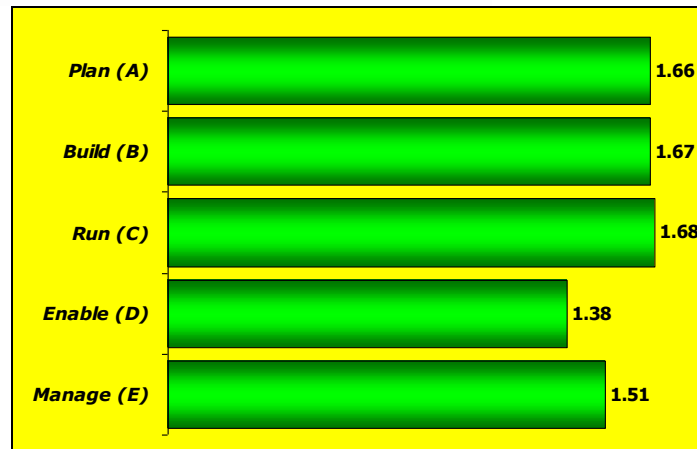
Among the countries surveyed, the percentage of matches varies from 16% to 25% between declared and calculated profiles. In detail:

- 16% of declared profiles in Norway matched the calculated profile
- 19% in Belgium, Malta and Ireland
- 20% in Spain and Bosnia and Herzegovina
- 21% in Italy and Romania
- 24% in Finland
- 25% in Latvia

For the reasons outlined above, we use the calculated profiles data for the analysis.

### **4.3 Analysis of Skills Diffusion**

Figure 22 below provides a comparison of the e-competence Knowledge Index for the five e-competence areas: Plan, Build, Run, Enable, Manage. The full value of each Knowledge Index is 3.0.



**Figure 22 – Knowledge Index by e-Competence Areas**

Results show a similar level of proficiency for the Plan, Build and Run areas, while for Manage and especially for Enable the average e-competence is more limited in Europe.

The relatively low result for the Enable Knowledge Index can be specifically attributed to insufficient coverage of four e-competences (see section 8.2, figure A4 and A5), namely Sales Proposal Development, Channel Management, Sales Management and Contract Management, all related to the Marketing and Sales area of the Enable competences. In general, this type of e-competence gap means that the attention paid to an internal or external client of a product or service has to be enhanced. The same considerations pertain to the Forecast Development e-competence, which is also shown to be at an insufficient level.

A deeper analysis of the Knowledge Indexes of each e-competence area is fundamental in order to design detailed training paths to cover the e-competence gaps for each proximity profile of each respondent.



## 5 Profile Analysis

The 1918 generated proximity profiles referred to 18 IT professional profiles (See figure 20 above). The eligibility criteria for the analysis of these profiles are as follows:

- 10 or more cases per country for each profile.
- A proximity profile score higher than 40%.
- The presence of the profile in at least three countries.

Following these criteria the following 10 profiles were analysed:

1. IT Manager
2. IT Quality Manager & Auditor
3. IT Project Manager
4. IT Systems Analyst
5. Software Developer
6. Integration & Testing Engineer
7. IT Administrator
8. IT Systems Engineer
9. Service Support Manager
10. IT Trainer

In this section a more in-depth analysis of the data for each of these 10 profiles is presented. The basic results of the other profiles are available in [section 8.5.2](#).

### 5.1 IT Manager

The following analysis is related to [section 8.3.1](#) and [section 8.5.2](#) of the report.

A large majority (93%) of European IT Managers have attained a university degree or higher; this is the highest rate among IT profiles. Moreover, 71% of IT Managers have attained a 4<sup>th</sup> level qualification (Masters or PhD), which is the second highest rate (only Business Analysts show a higher rate: 80%). Less than half (48%) of IT Managers have an education where IT is the main focus: IT Manager is the most non IT-focused profile in Europe.

The average IT Manager is 46.7 years old, the oldest among their European colleagues; of the IT Managers who responded 19% were female, which is slightly higher than the overall 16% female representation among European IT professionals.

IT Manager respondents are equally distributed between the IT supply side and the IT demand side (50%-50%).

The majority of European IT Managers work in large organisations (43%), a high rate compared to the general average for European respondents (19%).



European IT Managers show a high Knowledge Index in the Manage, Plan and Enable areas, whilst in Run and Build areas; IT Managers' KI is the lowest compared to other IT professionals.

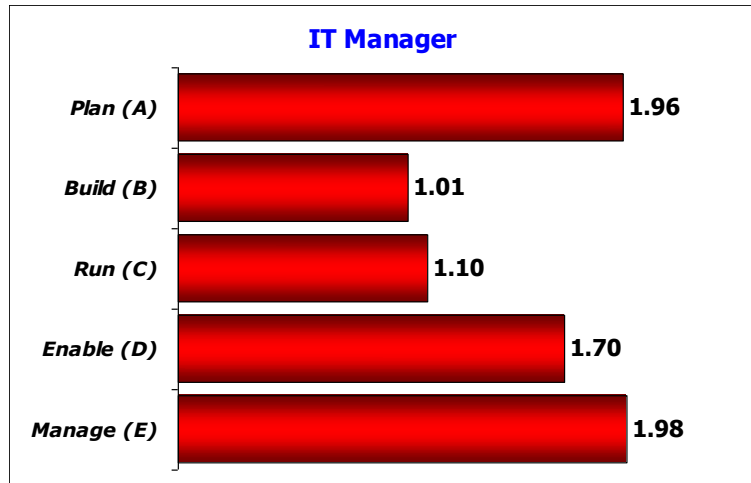


Figure 23 – Knowledge Index by e-Competence Areas for the Profile

The following graph compares the Knowledge Indexes (KI) of IT Managers in two countries: Ireland, which returned the highest IT Manager KI and Belgium which had the lowest. Results of other countries are similar, except for a higher KI in the Build area for Norwegian IT Managers and in the Run area for the Irish IT Manager. A high KI has been registered for Spain among the Manage, Plan and Enable areas.

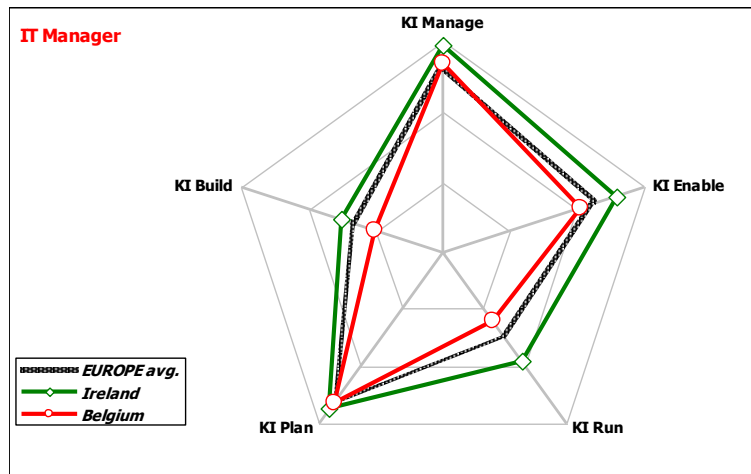


Figure 24 – Knowledge Index for the Profile between Ireland and Belgium

As regards demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** A 13 year age gap exists on average between the youngest and oldest respondent for this profile. The youngest IT Manager works in Malta (38 years old) while the oldest (51) works in Finland.
- **Female Representation:** The highest rate of female respondents (40%) work in Norway and the lowest in Belgium (7%) and Ireland (8%).



- **IT as a Main Focus in Education:** The highest rate of responses came from Norway (70%) while the lowest has been collected in Belgium (21%).
- **Industry Sector Predominance:** In Norway only 20% of respondents work in the IT supply side, while in Spain the proportion of IT Managers working in the IT supply side is 92%. The European level ratio of supply to demand sides is 50:50 for IT Managers.

## 5.2 IT Quality Manager & Auditor

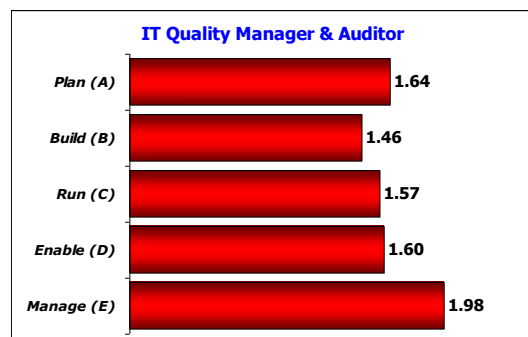
The following analysis is related to the figure in [section 8.3.2](#) and [section 8.5.2](#) of the report.

A high proportion (84%) of European IT Quality Managers & Auditors have attained a university degree or higher. Moreover, 54% of IT Quality Manager & Auditors have attained a 4<sup>th</sup> level qualification (Masters or PhD). The majority (59%) of IT Quality Managers & Auditors have an IT-focused education.

The IT Quality Manager & Auditor's average age is 43.1 years old, two years older than the typical IT professional. A relatively high number of the IT Quality Managers & Auditors who responded were female (30%), which is the second highest rate among IT profiles, and almost twice the general European female proportion for all respondents (16%).

A large number of European IT Quality Managers & Auditors respondents work in large organisations: the second highest rate (46%) among IT profiles and clearly higher than the average rate across Europe (34%). IT Quality Managers & Auditors respondents are equally distributed in the IT supply and demand side (50% each), not too different from the 51:49 European ratio.

IT Quality Managers & Auditors show a significantly higher Knowledge Index in the Manage area (the third highest), while some weakness is found in Build area (1.46 representing the third worst KI). The e-competences of Build area may not be a core requirement for the role of IT Quality Manager & Auditor which could explain the low KI for Build for this role.

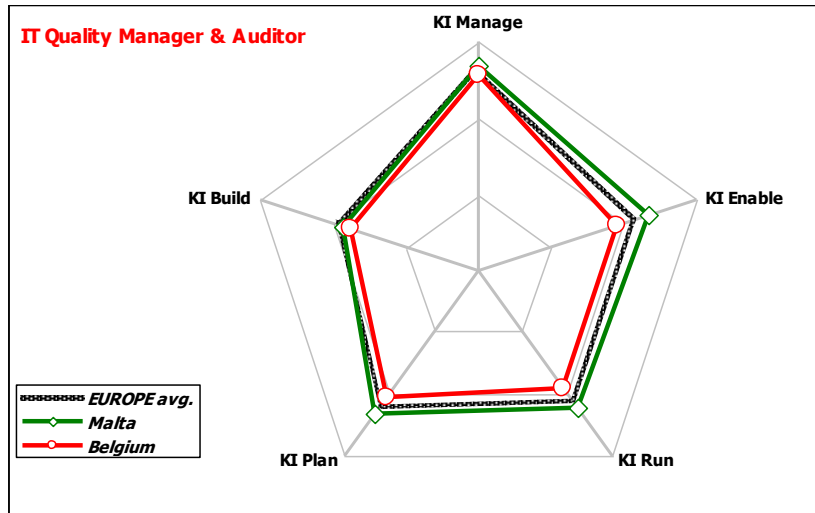


**Figure 25 – Knowledge Index by e-Competence Areas for the Profile**

The following graph compares the Knowledge Indexes of IT Quality Managers & Auditors in two countries: Malta, which returned the highest overall KI and Belgium



which had the lowest. Results from other countries are very similar to the European average. Finland registered the highest KI for the Build area.



**Figure 26 – Knowledge Index for the Profile between Malta and Belgium**

As regard demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** A 10 year age gap exists on average between the oldest and youngest respondent for this profile. The youngest IT Quality Manager & Auditor works in Malta (37 years old) while the oldest (47.3) works in Finland.
- **Female Representation:** The highest rate of female IT Quality Managers & Auditors (55%) was registered in Finland, the lowest in Belgium (16%) and Malta (20%).
- **IT as a Main Focus in Education:** The highest rate is registered in Norway (70%) while the lowest is in Belgium (21%).
- **Industry Sector Predominance:** In Norway only 20% of respondents work in the IT supply side, while in Spain the proportion of IT Quality Managers & Auditors working in the IT supply side is 92%. The European level ratio of supply to demand side is 50:50 for the IT Quality Manager & Auditor profile.

### 5.3 IT Project Manager

The following analysis is related to [section 8.3.3](#) and [section 8.5.2](#) of the report.

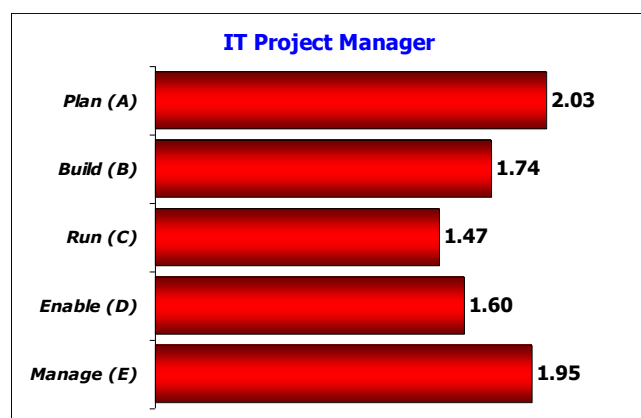
A large majority (87%) of European IT Project Managers have attained a university degree or higher; also quite significantly the proportion of IT Project Managers who have attained a 4<sup>th</sup> level qualification (Masters or PhD) is at 68% which is the third highest rate for an IT profile. Across Europe, 63% of IT Project Manager respondents have an IT-focused education.

European IT Project Managers are relatively equally distributed between the IT supply and demand side (49:51), exactly the same ratio is found for all respondents. The distribution of IT Project Managers by enterprise size showed an interesting division: 15% work in micro enterprises and 60% in larger organisations (250+ employees).



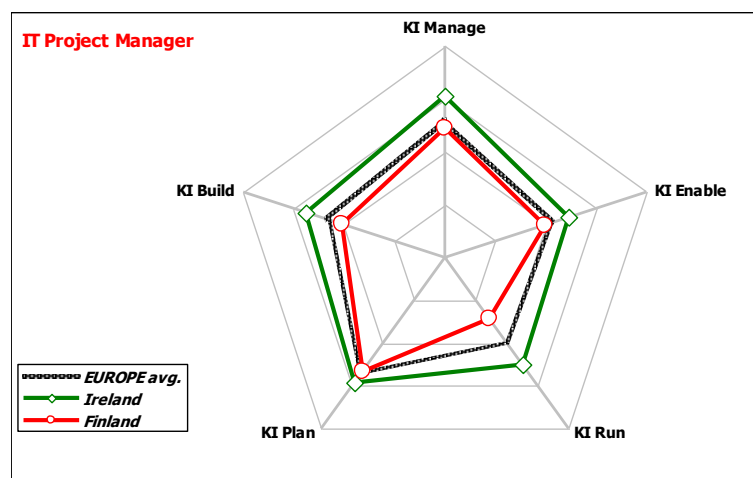
A large number of the IT Project Managers who responded are female (83%). With regard to age, IT Project Managers are the third oldest IT professionals in Europe (the two profiles even older than IT Project Manager are IT Manager and Business Analyst). The IT Project Manager is 2.5 years older than the average age of all respondents across Europe (41).

IT Project Managers show a significantly high Knowledge Index for the Plan area (2.03 is the second highest KI for the Plan area), while their competencies in the Run area are rather limited.



**Figure 27 – Knowledge Index by e-Competence Areas for the Profile**

The graph below compares the Knowledge Indexes of IT Project Managers in two countries: Ireland, which has the highest overall KI and Finland which has the lowest. Results from other countries are similar to these: Italy, even if less than Ireland, shows a broader range of e-competences than the average in all areas, while Belgium, as with Finland, reports some limitations in the Run and Build areas.



**Figure 28 – Knowledge Index for the Profile between Ireland and Finland**

As regard demographics the most relevant differences registered for this profile among analysed countries are:



- **Age:** A 5.5 year age gap exists on average between the oldest and youngest respondent for this profile: The youngest IT Project Manager works in Italy (39.4 years old) while the oldest (44.9) works in Finland.
- **Education Level:** All Belgian IT Project Managers have a university degree, while in Italy only 68% have a degree. As regard Masters and PhDs the highest rate (84%) has been registered in Belgium, the lowest in Ireland (44%).
- **Professional Status:** A remarkable proportion (28%) of IT Project Managers is self-employed in Ireland, but none in Finland.
- **Industry Sector Predominance:** Only in Ireland the majority of IT Project Managers (56%) work in the supply side; in Finland and Belgium the majority work in the demand side (56% and 58% respectively). The European ratio for IT demand and supply was 51% to 49%.

#### 5.4 IT Systems Analyst

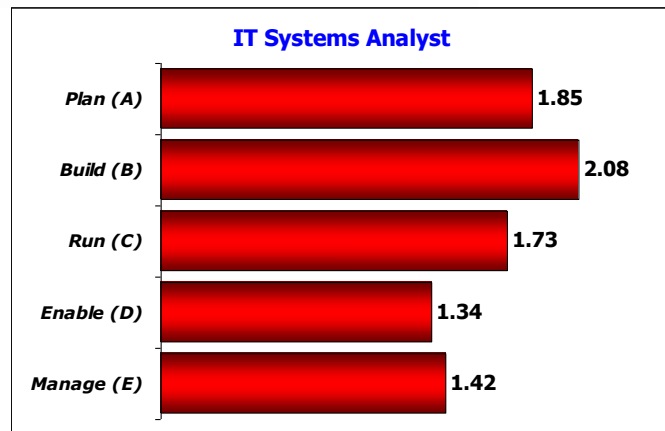
The following analysis is related to [section 8.3.4](#) and [section 8.5.2](#) of the report.

80% of European IT Systems Analysts have attained a university degree or higher, a proportion in line with the overall European average for IT professionals (79%). Moreover, 56% of IT Systems Analysts have attained a 4<sup>th</sup> level qualification (Masters or PhD), which is slightly greater than the total European average of 51%. A large number of IT Systems Analysts have an education where IT has been the main focus, the third highest rate (73%) among IT profiles and 10% higher than the overall rate for IT professionals across Europe and beyond.

The European IT Systems Analyst respondent is 41.7 years old, nearly the same as the overall average European age (41). A large majority of the IT Systems Analysts who responded are male (85%), which is nearly the same as the 84% European average.

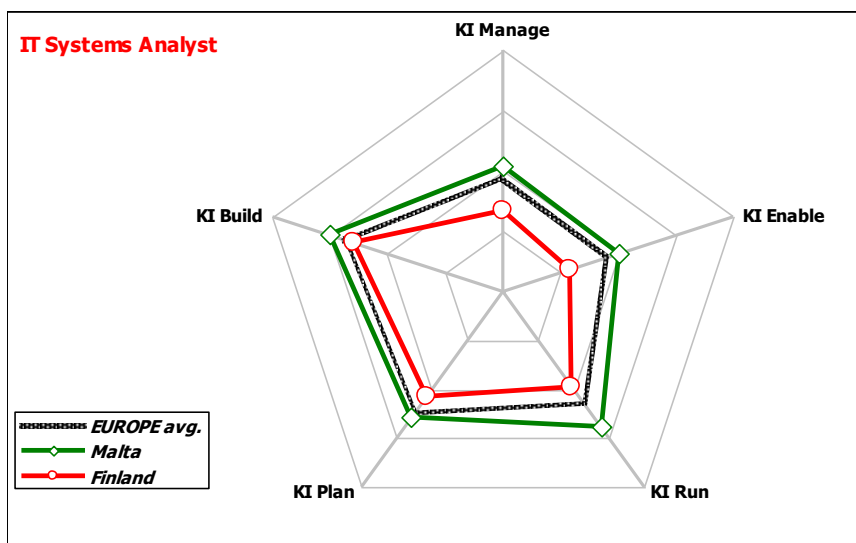
In Europe, IT Systems Analysts work mainly in the IT supply side (56%), and a breakdown by organisation size shows that 45% work mostly in small and medium enterprises, with 55% working in organisations with 250+ employees.

IT Systems Analysts show low Knowledge Indexes in Manage and Enable areas, and higher than the overall average in Run and Plan area; concerning the Build area, IT Systems Analysts got the third highest score.



**Figure 29 – Knowledge Index by e-Competence Areas for the Profile**

In figure 30 the Knowledge Indexes of IT Systems Analysts in two countries are compared: Malta, which has the highest overall KI and Finland which has the lowest. Results from other countries are quite similar: the Maltese IT Systems Analyst has a deeper level of proficiency in the Run and Build areas, while Italian IT Systems Analysts seem to have more competence for the Manage and Enable areas. Apart from the Build area, the overall results point to low levels of e-competence among Latvian and especially Finnish IT Systems Analysts.



**Figure 30 – Knowledge index for the Profile between Malta and Finland**

As regard demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** An 11.4 year age gap exists on average between the youngest and oldest respondent for this profile: The youngest IT Systems Analyst works in Latvia (35.1 years old) while the oldest (46.5) works in Finland.
- **Female Representation:** The highest rate of female IT Systems Analysts (31% - twice the average rate across Europe) has been registered in Latvia, the lowest in Malta (5%).



- **Education Level:** 93% of Spanish IT Systems Analysts declare they had a university degree, while in Malta only 63%. A contrasting situation has been found for Masters and PhDs: the highest rate (83%) is registered in Ireland, the lowest in Malta (21%).
- **IT as a Main Focus in Education:** The highest rate is shown by Spanish respondents (86%) while the lowest is shown by Italian respondents (46%).
- **Industry Sector Predominance:** Only 21% of IT Systems Analyst respondents in Finland work in the IT demand industry, while in Latvia the respondents with this calculated profile exceed half (54%).

### 5.5 Software Developer

The following analysis is related to [section 8.3.5](#) and [section 8.5.2](#) of the report.

A large number (78%) of European Software Developers have attained a university degree or higher, which is in line with the general average for European IT professionals (79%). Also the achievement of 4<sup>th</sup> level qualification (Masters or PhD) shows an equal rate between Software Developers (49%) and the general European average (51%). In Europe 68% of Software Developer respondents have an IT-focused education.

The European Software Developer is younger than the average IT professional at 39.2 years old while the average age of all respondents is 41. The larger proportion of Software Developers who responded is male (84%), the same rate as the general average.

Software Developers work mainly on the IT supply side, with a proportion of 60%, the highest rate found for an IT profile at European level. The distribution by enterprise size reflects the European average, with about one-third working in large organisations (1000+ employees), one quarter in medium-large (251-1000) and a similar amount in small and medium organisations (51-250); the rate of workers with this profile in micro enterprises is only 7%, the third lowest rate.

Software Developers show a high Knowledge Index for the Build area, while in Plan, Enable and Manage areas Software Developers score a low KI, second and third lowest among IT profiles. The focused nature of the Software Developers' role in IT could be a contributing factor to this narrow competence and poorer performance in non-role related e-competence areas.

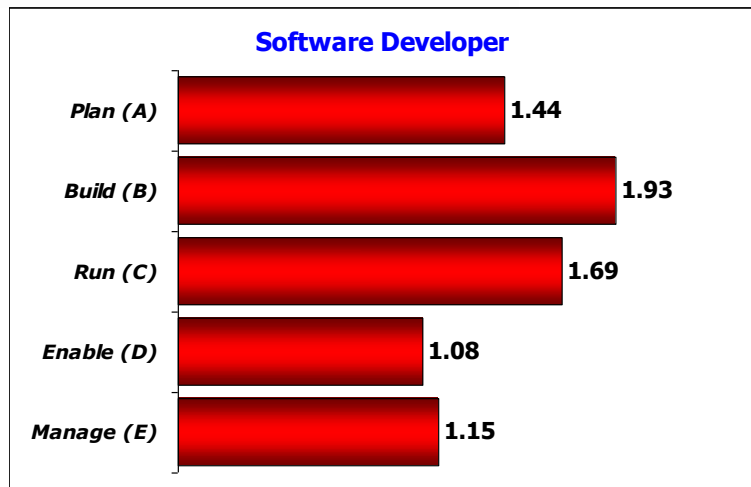


Figure 31 – Knowledge Index by e-Competence Areas for the Profile

The graph below compares the Knowledge Indexes of Software Developers in two countries: Italy, which has the highest overall KI and Belgium which has the lowest. Results from other countries are similar to these: we note a deeper proficiency level for Norway, in addition to Italy in Enable, Plan and Manage areas and in the Manage area Ireland also has a higher KI. However Spanish and Belgian Software Developers show a widespread weakness, with Spain scoring lower than the European average in all areas except one (Build) and Belgium scoring lower in all five e-competence areas.

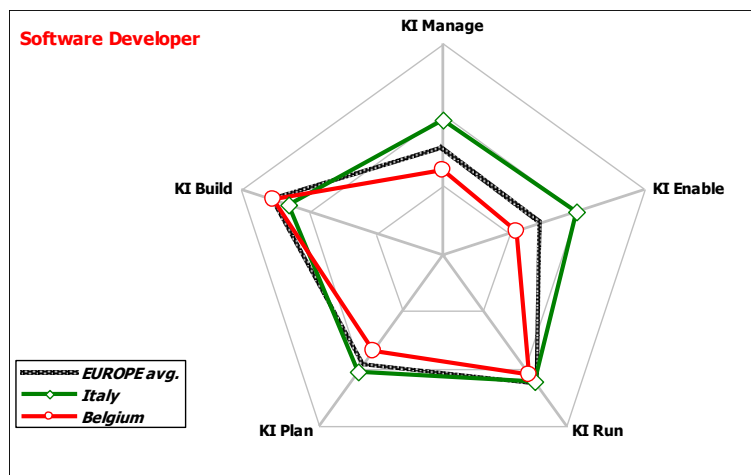


Figure 32 – Knowledge Index for the Profile between Italy and Belgium

As regard demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** A 10 year age gap exists on average between the youngest and oldest respondent for this profile. The youngest Software Developer works in Malta (34 years old) while the oldest (44) works in Ireland.
- **Female Representation:** The highest rate of female Software Developers (28%) has been registered in Finland, with lower rates in Belgium (6%) and Norway (7%).



- **Education Level:** All Belgian Software Developers have a university degree, while in Italy only 57% have. Looking at achievement of Masters and PhDs, the highest rate (86%) has been registered in Norway, the lowest in Malta (26%).
- **IT as a Main Focus in Education:** The highest rate is registered for Norway (93%) while the lowest is registered in Italy (57%).
- **Industry Sector Predominance:** Only 32% of respondents with this calculated profile work in the supply side in Ireland, while in Malta the proportion of Software Developers working in the IT supply side is 89%.

## 5.6 Integration & Testing Engineer

The following analysis is related to [section 8.3.6](#) and [section 8.5.2](#) of the report.

80% of European Integration & Testing Engineers have attained a university degree or higher, which is in line with the general average of European IT professionals (79%). However, 41% of European Integration & Testing Engineers attained a 4<sup>th</sup> level qualification (Masters or PhD), which is lower than the European average (51%). In Europe 77% of Integration & Testing Engineers have an IT-focused education, a proportion higher than the general average for the profile (63%).

The Integration & Testing Engineer is 38.2 years old on average, the youngest among the IT profiles. The greater proportion of the Integration & Testing Engineers who responded were male (80%), which is slightly less than the 84% male proportion for all European respondents.

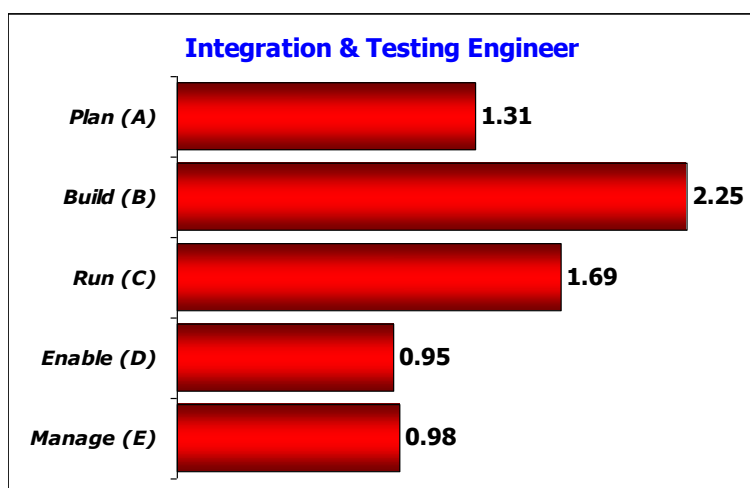


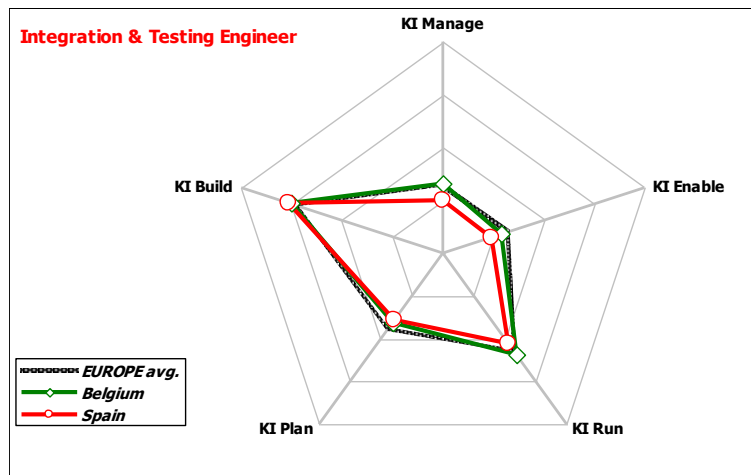
Figure 33 – Knowledge Index by e-Competence Areas for the Profile

Integration & Testing Engineers work mainly in the IT demand side (57%, the third highest rate), slightly higher compared to the 51% for the IT demand side across all profiles. The distribution by enterprise size reflects the overall European results.

Integration & Testing Engineers show the best Knowledge Index among IT profiles, for the Build area. In the Run area the KI is similar to the overall average, but as regard the remaining areas (Plan, Enable and Manage), the Integration & Testing Engineer results show the worst Knowledge Indexes for each area.



The following graph compares the Knowledge Indexes of Integration & Testing Engineer in two countries. Belgium has the highest overall KI and Spain has the lowest. In any case we can note, for Malta, the KI is slightly higher than other countries only in the areas of Build and Run typical for the Integration & Testing Engineer profile.



**Figure 34 – Knowledge Index for the Profile between Belgium and Spain**

As regard demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** A 15 year age gap exists on average between the youngest and oldest respondent for this profile: The youngest Integration & Testing Engineer works in Malta (31.4 years old) while the oldest (46.2) works in Spain.
- **Female Representation:** The highest rate (31%) has been registered in Romania, the lowest in Spain (13%).
- **Education Level:** All Romanian Integration & Testing Engineers have a university degree, while in Malta only 65% have. Regarding Masters and PhDs, the highest rate (46%) has been registered in Romania, the lowest in Malta (9%).
- **IT as a Main Focus in Education:** The highest rate is shown by respondents from Romania (92%) while the lowest is shown by Spanish respondents (63%).
- **Industry Sector Predominance:** Only 27% of respondents work in the IT supply side in Belgium, while in Malta the proportion of Integration & Testing Engineers working in the IT supply side is 52%.

## 5.7 IT Administrator

The following analysis is related to [section 8.3.7](#) and [section 8.5.2](#) of the report.

The majority of European IT Administrators (64%, the third lowest result) have attained a university degree or higher, a rate clearly lower than the average for IT professionals (79%). In respect of the achievement of a 4<sup>th</sup> level qualification (Masters or PhD), IT Administrators also have a low rate: 30%, compared to the average rate of all respondents which is 71%. A larger proportion (69%) of IT

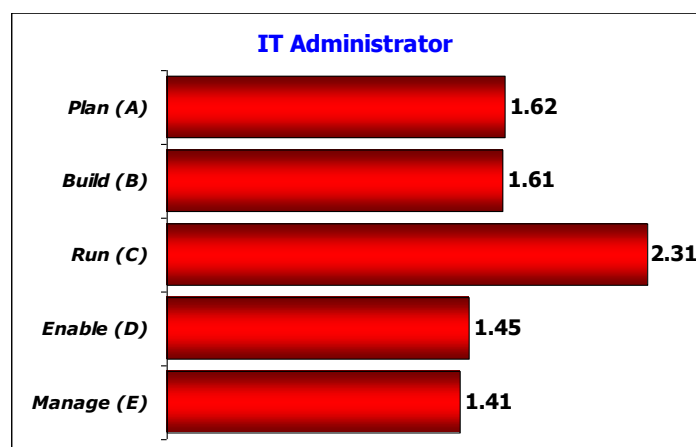


Administrators has an education where IT is the main focus, compared to 63% for all European IT professionals.

IT Administrators work principally in the IT demand side (65%, the highest rate of all IT profiles). Their distribution by enterprise size is quite similar to the distribution of all respondents in Europe, and shows only a slightly smaller proportion of respondents in larger (1000+) organisations – 26% instead of 34% in Europe - and a corresponding slightly larger proportion in medium-large organisations (251-1000 employees) 28% instead of 21% in Europe.

European IT Administrators are 38.3 years old on average, about three years younger than the average of their colleagues across all IT fields. They are the second youngest IT professional. A very small proportion of IT Administrators who responded were female, only 7%. This is less than half the average European female rate (15%).

IT Administrators show an average set of Knowledge Indexes, except for the Run area: in this area IT Administrators demonstrate a deep level of competence (KI score is the highest among IT professionals).



**Figure 35 – Knowledge Index by e-Competence Areas for the Profile**

The graph below compares the Knowledge Indexes of IT Administrators in two countries: Spain, which has the highest overall KI and Romania which has the lowest. Romanian IT Administrators displayed a more limited competence in Manage, Enable and Plan areas, perhaps due to a lack of experience, since they are the youngest in Europe. For other countries the e-competence graphs are similar, even if we note some major differences in the Run area, the strong point for IT Administrators. In the Run area KI ranges from 1.85 for Norway, to 2.54 for Spain (intermediate values are shown for Italy 2.13, Romania 2.38 and Ireland 2.48). In Italy and Norway a better KI than average is shown in the Manage and Enable areas.

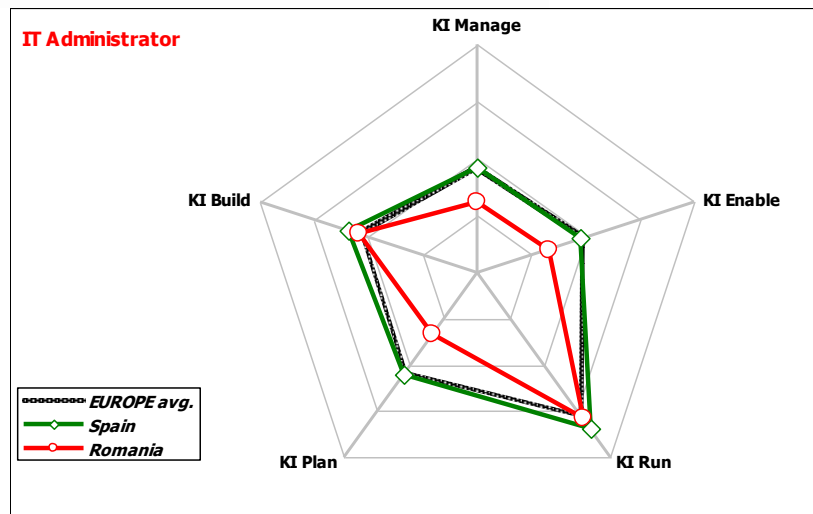


Figure 36 – Knowledge Index for the Profile between Malta and Finland

As regard demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** A 10 year age gap exists on average between the youngest and oldest respondent for this profile: The youngest IT Administrator works in Romania (32 years old) while the oldest (42) works in Norway.
- **Female Representation:** The highest rate (20%) was registered in Spain; no female IT Administrator respondents were found in Norway and Romania.
- **Education Level:** 91% of Romanian IT Administrators have a university degree, while in Italy only 45% have. Regarding Masters and PhDs, the highest rate (46%) is registered in Norway, the lowest in Romania (18%).
- **IT as a Main Focus in Education:** The highest rate was registered by respondents in Norway (92%) and Romania (91%), while the lowest was registered by Italian respondents (45%).
- **Professional Status:** In Romania all IT Administrators are full-time employees, while in Spain only 60% work full-time (the lowest rate).
- **Presence in Micro-enterprises:** In Spain a high proportion of IT Administrators work in micro-organisations (31%) - the European average for this role is 12% - while in Romania none of the IT Administrator respondents worked in micro-enterprises.
- **Industry Sector Predominance:** Only 15% of respondents work in the IT supply side in Norway, while in Romania the proportion of IT Administrators working in the IT supply side is 36%.

## 5.8 IT Systems Engineer

The following analysis is related to [section 8.3.8](#) and [section 8.5.2](#) of the report.

63% of IT Systems Engineers have attained a university degree or higher, lower than the 79% average of all respondents in Europe. However, 38% of IT Systems Engineers have attained a 4<sup>th</sup> level qualification (Masters or PhD), which is in line with the general average of 51%. In Europe, 58% of IT Systems Engineers respondents declare that they have an IT-focused education, quite low compared to 63% of all respondents.



The IT Systems Engineer is 38.6 years old, younger than other IT professionals, and ranked as the third youngest across Europe. The majority of IT Systems Engineers who responded were male (95%); this role is ranked the lowest in terms of having female representation.

IT Systems Engineers work mainly in the IT demand side (54%), a proportion not too different from 51%, the overall average.

IT Systems Engineers show an average level of Knowledge Index results, except for the Run area, where their Knowledge Index is the second highest among IT professionals.

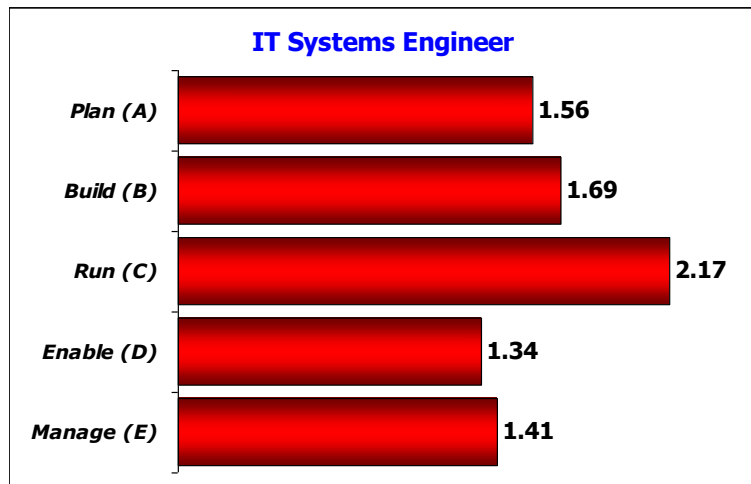
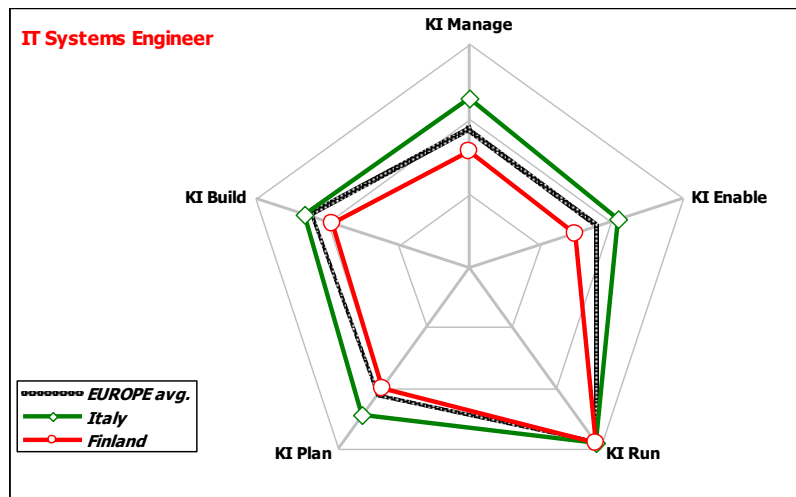


Figure 37 – Knowledge Index by e-Competence Areas for the Profile

The following graph compares the Knowledge Indexes of IT Systems Engineers in two countries: Italy, which has the highest global KI and Finland which has the lowest. Results from other countries are similar. A noticeable strength for IT Systems Engineers is the Run Area; a high level of expertise is registered for Spain in the Build area.





### Figure 38 – Knowledge Index for the Profile between Italy and Finland

As regard demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** Nearly a 10 year age gap exists on average between the youngest and oldest respondent for this profile. The youngest IT Systems Engineer works in Italy (38.6 years old) while the oldest (48.2) works in Finland. However all of them are older than the European average for this role (38.6).
- **Female Representation:** At European level the female proportion is very low for this role (5%), and no female representation was noted from respondents in Italy, Finland and Spain.
- **IT as a Main Focus in Education:** The highest rate of respondents is registered in Spain (60%) while the lowest is declared in Italy (44%).
- **Education level:** 80% of Spanish IT Systems Engineers have a university degree, while in Finland only 27% have. The highest rate for Masters and PhDs (40%) was noted in Spain and the lowest in Finland (18%).
- **Industry Sector Predominance:** Only 36% of respondents in Finland work in the IT supply side, while in Spain the proportion of IT Systems Engineer working in the IT supply side is about twice that (70%).

#### 5.9 Service Support Manager

The following analysis is related to [section 8.3.9](#) and [section 8.5.2](#) of the report.

A large proportion (81%) of Service Support Managers have attained a university degree or higher. Moreover, 41% of Service Support Managers have attained a 4<sup>th</sup> level qualification (Masters or PhD). 60% of the Service Support Manager respondents have an education in which IT was the main focus, a proportion close to the average of 63% for all European respondents.

The Service Support Manager average age is 40.3 years old, almost one year younger than the European average (41). A large number of the Service Support Managers who responded were male (83%), which is somewhat lower than the 84% male proportion of all respondents.

Service Support Managers work mainly in the IT demand side (54%), a similar proportion to the overall average of 51%. The majority of Service Support Managers work in medium and large organisations (86%), only 14% work in micro and small organisations (1-50 employees): a significantly low rate compared to the 23% average of all respondents.

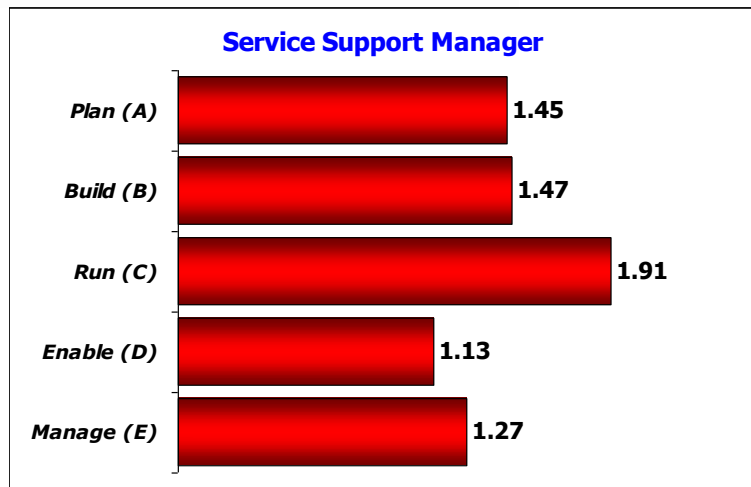


Figure 39 – Knowledge Index by e-Competence Areas for the Profile

Service Support Managers generally scored low Knowledge Indexes. Only in the Run area is their KI higher than average (ranked sixth), while in all the remaining areas their KI is significantly lower than average (for each area the fourth worst).

The graph below compares the Knowledge Indexes of Service Support Managers in two countries: Ireland, which has the highest overall KI and Finland which has the lowest. Other country results, such as Belgium had a low KI whereas the Maltese IT professionals scored a high KI in Build and Plan areas.

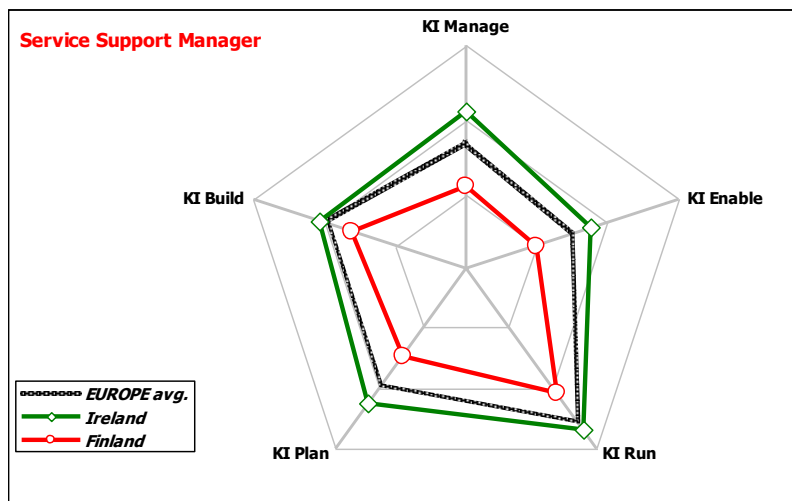


Figure 40 – Knowledge Index for the Profile between Ireland and Finland

As regard demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** A six year age gap exists on average between the youngest and oldest respondent for this profile: The youngest Service Support Manager working in Malta (37.4 years old) and the oldest (43.7) working in Belgium.
- **Female Representation:** The highest rate (31%) was registered in Belgium, the lowest in Spain (5%).



- **IT as a Main Focus in Education:** The highest rate was registered in Spain (74%) while the lowest was in Ireland (41%).
- **Presence in Large Enterprises (1000+ employees):** In Belgium a large majority of Service Support Managers work in large organisations (94%, while the European average for this role is 37%), in Malta the rate was only 8%.
- **Industry Sector Predominance:** 40% of respondents in Malta work in the IT supply side, while in Spain the proportion of Service Support Managers working in the IT supply side is 63%.

### 5.10 IT Trainer

The following analysis is related to [section 8.3.10](#) and [section 8.5.2](#) of the report.

A large proportion, 85%, of IT Trainers attained a university degree or higher, which is slightly higher than the general average (79%) in Europe. Among European IT Trainers, 57% attained a 4<sup>th</sup> level qualification (Masters or PhD), which is slightly higher than the average of 51%. A majority (43%) of IT Trainers have an education where IT was either a side subject or not significant in the curriculum, compared to 37% of all respondents.

The IT Trainer is 41.1 years old, equal to the average European IT professional. A large number of the IT Trainers who responded are female (41%), which is markedly higher than the 16% female proportion for all respondents. The IT Trainer is the professional profile in which women are most represented.

An almost equal proportion of IT Trainers work in the IT supply side (51%) as well as the IT demand side (49%), similar to the overall European average. Also with distribution by enterprise size no differences are registered (compared to the European average).

IT Trainers show Knowledge Indexes lower than the overall European average, especially in the Plan, Build and Run areas, where the IT Trainers' KI results were the second lowest overall.

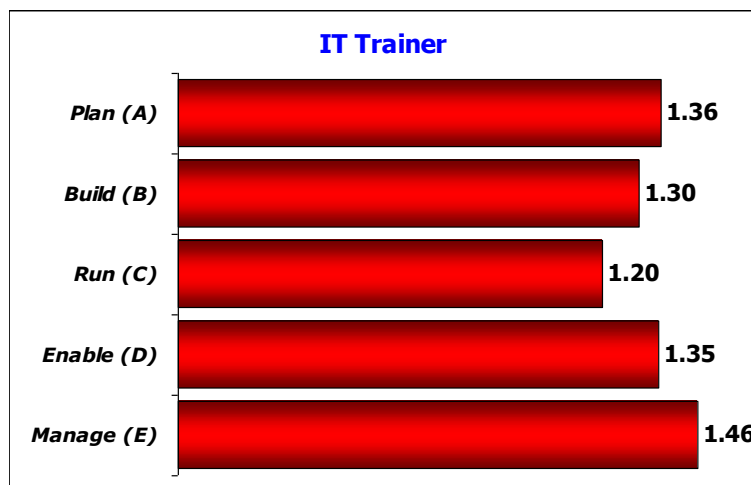
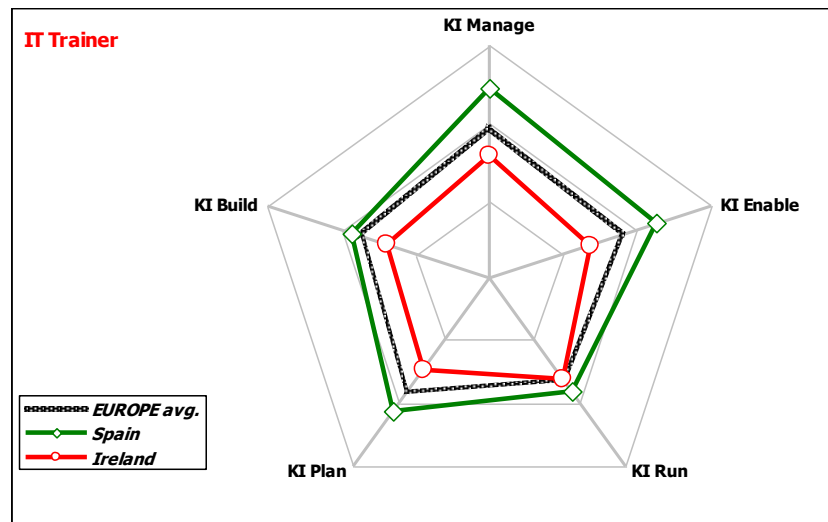


Figure 41 – Knowledge Index by e-Competence Areas for the Profile



The following graph compares the Knowledge Indexes of IT Trainers in two countries: Spain, which had the highest overall KI and Ireland which had the lowest. Results from other countries highlight that the Belgian IT Trainer has a deeper level of competencies in the Manage and Enable areas, while the Maltese IT Trainer has a high KI in the Build and Plan areas. The results also show a weakness in the Build area among Latvian respondents.



**Figure 42 – Knowledge Index for the Profile between Spain and Ireland**

As regard demographics the most relevant differences registered for this profile among analysed countries are:

- **Age:** A 12 year age gap on average exists between the youngest and oldest respondent for this profile: The youngest IT Trainer works in Malta (34 years old) while the oldest (46) works in Finland.
- **Female Representation:** The highest rate of female representation in this calculated profile is registered in Finland (62%), with the lowest in Belgium (20%).
- **Education Level:** All Belgian IT Trainers have a university degree while in Ireland 83% have a degree, the lowest rate.
- **IT as a Main Focus in Education:** The highest rate was declared by respondents from Malta (75%) while the lowest was registered by respondents in Belgium (20%).
- **Industry Sector Predominance:** Only 27% of Latvian respondents work in the IT supply side, while the proportion of IT Trainers working in the IT supply side is 70% in Spain and 71% in Finland.



## 6 Analysis of Calculated IT Profile Clusters

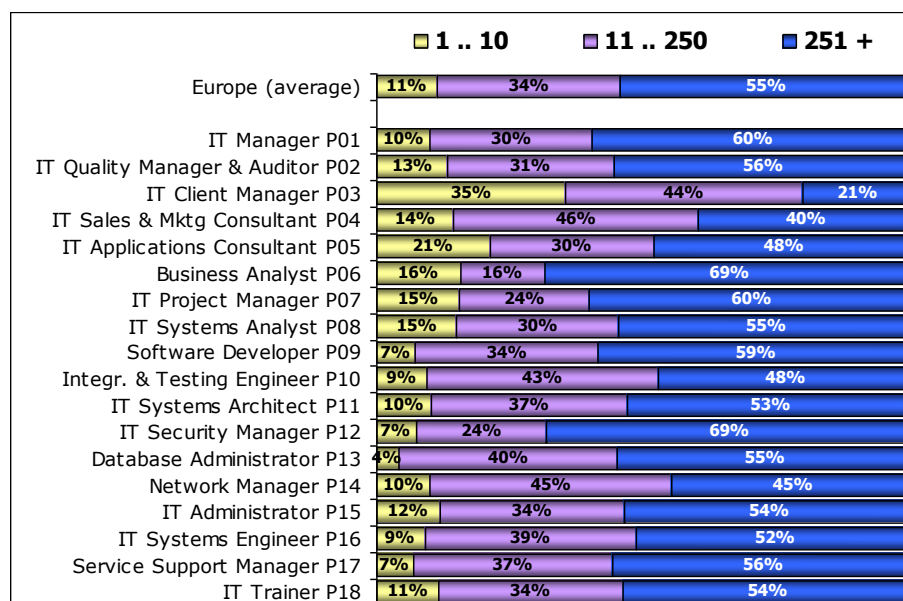
In this section further analysis is conducted into the 16 clusters of the same IT career profiles that were calculated to best match the e-competences of each of the 1918 respondents to the survey. Overall, none of the 18 IT profiles were left unmatched to the e-competences of the respondents, but only 16 IT profiles actually were calculated for at least 10 respondents per country. These 16 IT profiles therefore provide the basis for the European comparisons in this section, while the full 18 calculated IT profiles are still drawn upon throughout.

This analysis that follows should be evaluated based on the fact that the results are qualitative both in terms of the country level and the European benchmark. The results and analysis can be considered as a precursor to a wider discussion among individual professionals, between professionals and their Informatics Societies and, last but not least, among CEPIS Members and the CEPIS Task Force on Professionalism.

The following depicts the variables characterising the labour markets in which the IT professional works.

### 6.1 Profile and Demographic Analysis

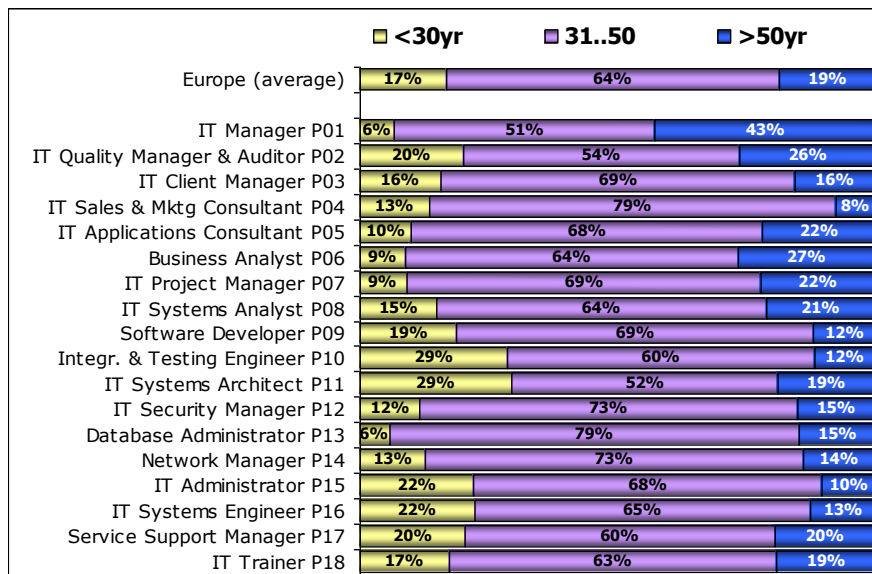
In figure 43 we see the distribution of profiles by the size of the organisation in which respondents have declared they work. There is evidence that the majority work in larger organisations; in particular for profiles like Business Analyst, IT Security Manager, IT Project Manager, IT Manager and Software Developer (all with a rate higher than 58%). In contrast only four profiles, IT Client Manager, IT Applications Consultant, Business Analyst and IT Project Manager (all with rates higher than 15%) work in very small companies (1-10 employees) (see [section 8.4.2](#)).



**Figure 43 – Profile Distribution by Enterprise Size**

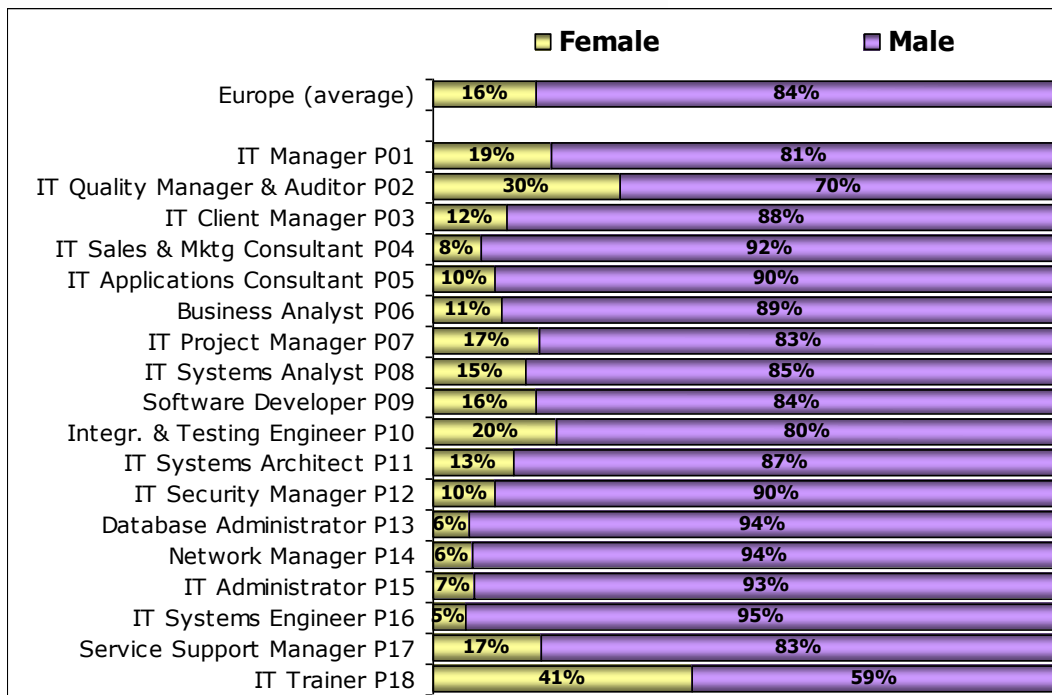


The segmentation of the profiles by age shows that the average age is 41 years and that in all profiles more than 50% are in the 31-50 age bracket. However, the findings show (figure 44) that the balance between young and old can also depend on the IT profile to a degree. In particular we can consider IT Manager, Business Analyst, IT Quality Manager & Auditor, IT Project Manager and IT Applications Consultant as “senior” profiles (all with a rate of over 22% in the “over 50” category). In contrast we can consider IT Systems Architect, Integration & Testing Engineer, IT Systems Engineer and IT Administrator as “junior” profiles (all with “under 30” rates higher than 22%), see [section 8.4.1](#).



**Figure 44 – Profile Distribution by Age**

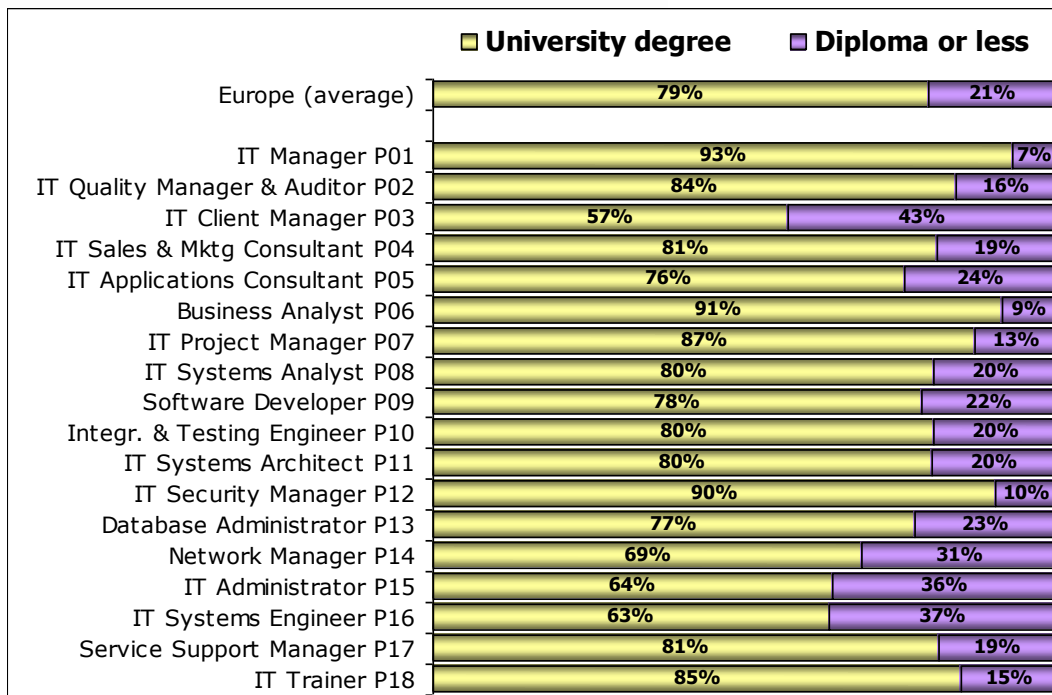
The distribution of profiles by age confirm that some profiles have a population with higher seniority than others, such as IT Manager, IT Quality Manager and Auditor and Business Analyst; seniority in those profiles is linked to a higher level of organisational experience and as a consequence, higher competence for complex projects or management responsibilities.



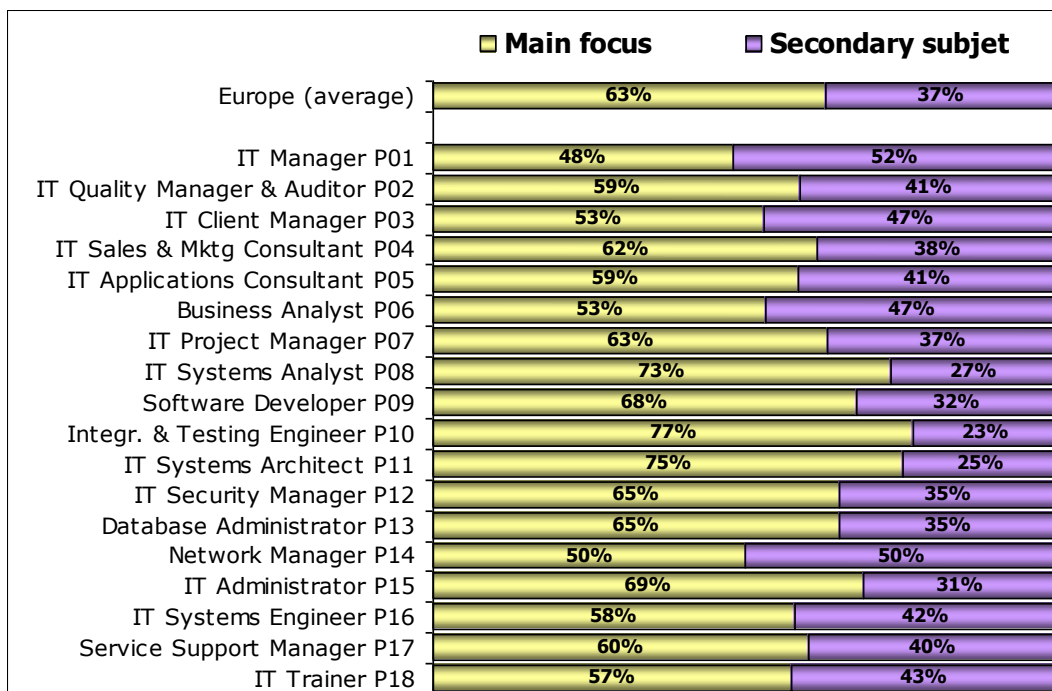
**Figure 45 – Profile Distribution by Gender**

The segmentation of the profiles by gender ([section 8.4.3](#)) provides evidence that female representation is extremely limited overall. There are only two profiles in which females are represented at more than 20% (IT Quality Manager & Auditor: 30% and IT Trainer: 41%). In addition, the proportion of female IT professionals is lower than 10% in one third of the profiles; IT Applications Consultant, IT Sales & Marketing Consultant, IT Administrator, Network Manager, Database Administrator and IT Systems Engineer.

The segmentation of profiles by educational level ([section 8.4.4](#) and [8.4.5](#)) show results with a high level of attainment of university degrees. However, it should also be noted that not all profiles require an in-depth educational focus. For example, the IT Client Manager, IT Administrator and IT System Engineer appear to place relevant profile experience as an important factor for the professional career.



**Figure 46 – Profile Distribution by Education Level**



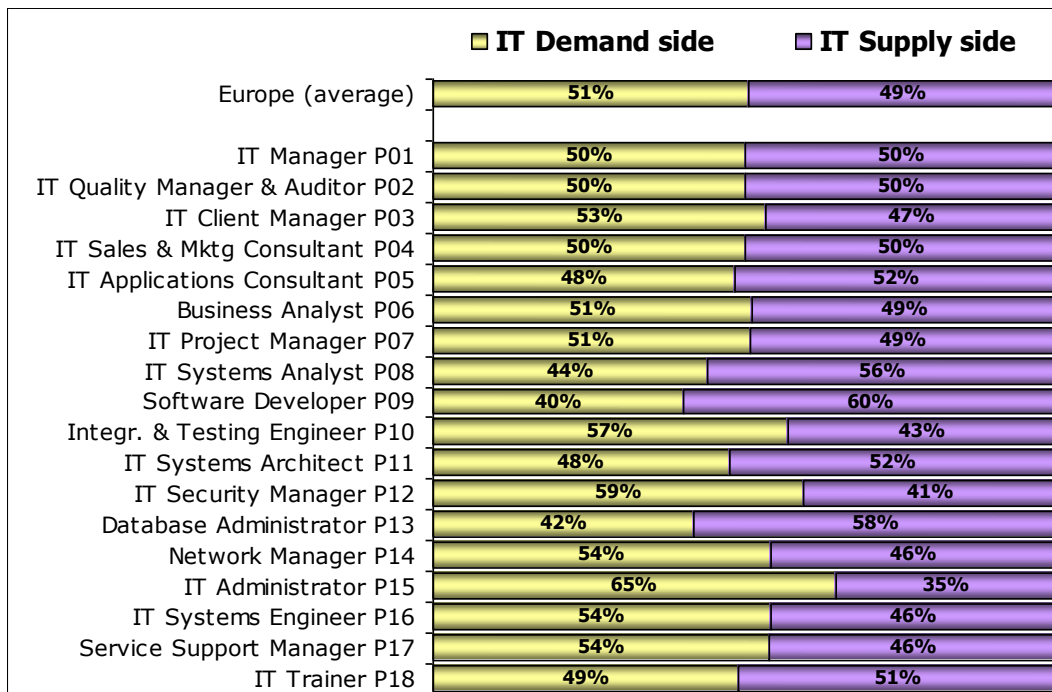
**Figure 47 – Profile Distribution by IT-focused Education**

For all of the 18 profiles, the rate of achievement of a university degree is higher than 50%, ranging from 57% for IT Client Manager through to 93% for IT Manager. With respect to the profile distribution by IT education, there is some evidence to suggest an insufficient IT education for some profiles. For profiles like Business Analyst, IT Client Manager, Network Manager and IT Manager (all with a proportion of non IT-



focused education higher than 45%), evidence of the importance of a non IT-focused education can be seen.

The majority of the IT profiles work in the IT demand side ([section 8.4.6](#)). According to figure 48, nine profiles registered a predominance of respondents for the IT demand side, but only three had a proportion higher than 55% (Integration & Testing Engineer, IT Security Manager and IT Administrator); a further three show a perfect 50:50 ratio (IT Manager, IT Quality Manager & Auditor and IT Sales & Marketing Consultant) and the remaining six have a majority of respondents from the IT supply side, but, again, only three have a proportion higher than 55% (Software Developer, Database Administrator and IT Systems Analyst).



**Figure 48 – Profile Distribution by IT Industry**

For the level of Knowledge Index ([section 4.3](#)) for all European respondents, the results are quite negative, with respect to almost all the five areas. For example, the Enable area scored a very low KI overall (1.4 on a 0.0 – 3.0 scale). An in-depth analysis of the Knowledge Indexes compared to each profile requirement is fundamental in order to design detailed training paths to cover the e-competence gaps for each proximity profile of each respondent.

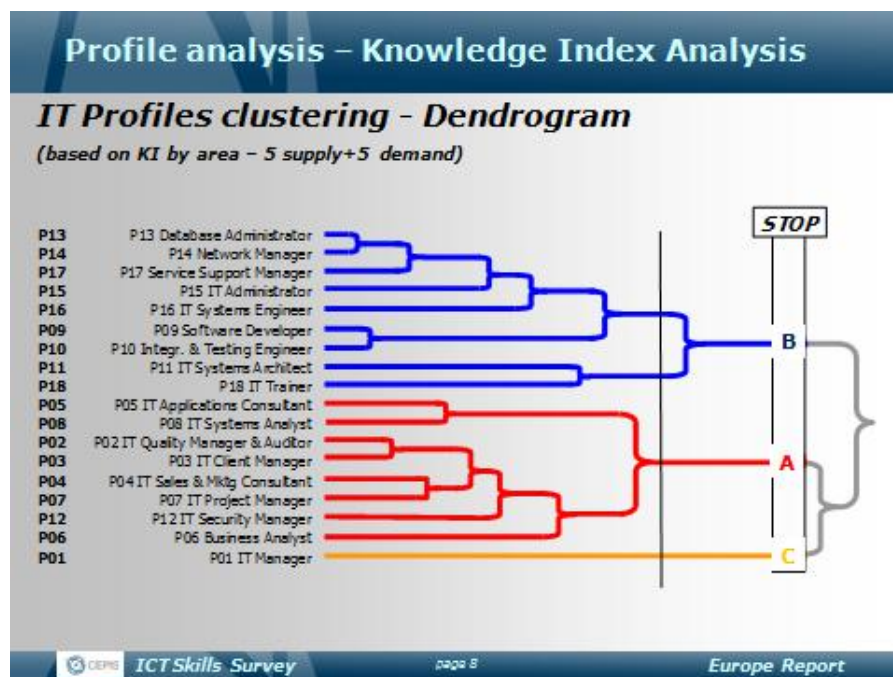
## 6.2 IT Profile Clustering

A clustering procedure (Hierarchical Cluster Analysis) has been adopted to analyse the 18 IT profiles and identify relatively homogeneous groups of profiles based on selected characteristics. This is carried out using an algorithm that starts with a separate cluster in each case and then combines clusters until only one is left.



In the analysis we have carried out on the 18 profiles of the CEPIS Survey, 10 variables have been used: Knowledge Indexes in five e-competence areas either for the IT demand side and the IT supply side.

The dendrogram<sup>19</sup> in figure 49 below shows how the three clusters were generated; the tool analyses and selects the profiles with the nearest KI values; the first two profiles (Database Administrator and Network Manager).



**Figure 49 - Profile Analysis – Knowledge Index Analysis**

The following table shows the basic data used for the analysis and selection of the Database Administrator and Network Manager profiles; the third closest profile was Service Support Manager and the fourth was IT Administrator and so on. Three clusters have been produced, with nine profiles grouped in cluster A, eight in cluster B and one in cluster C.

The basic data used for the analysis and resulting clusters is represented in figure 50. It shows the number of cases and Knowledge Index for each area at an overall level (Total), as well as showing a breakdown of the IT professionals who declared they work in the supply side (S) or in the demand side (D) of the IT industry. A red or green background highlights the highest or the second highest KI for each profile.

<sup>19</sup> A *dendrogram* is a tree diagram used to illustrate the arrangement of the clusters produced by hierarchical clustering.



	Cases					Plan area			Build area			Manage area			Enable area			Run area			
	Total	S	D	n.a.	% S	% D	Total	S	D	Total	S	D	Total	S	D	Total	S	D	Total	S	D
P02 IT Quality Manager & Auditor	80	38	38	4	50%	50%	1.65	1.58	1.69	1.47	1.44	1.48	1.98	1.88	2.05	1.60	1.48	1.70	1.58	1.58	1.61
P03 IT Client Manager	51	22	25	4	47%	53%	1.84	1.74	1.92	1.61	1.52	1.68	1.96	1.80	2.10	1.84	1.71	1.95	1.65	1.54	1.74
P04 IT Sales & Mktg Consultant	52	21	21	10	50%	50%	1.87	1.91	1.86	1.70	1.71	1.68	1.66	1.66	1.64	1.72	1.67	1.71	1.53	1.50	1.49
P05 IT Applications Consultant	41	17	16	8	52%	48%	1.92	1.89	1.99	2.24	2.35	2.28	1.80	1.63	1.90	1.43	1.35	1.39	1.81	1.81	1.90
P06 Business Analyst	45	20	21	4	49%	51%	2.24	2.31	2.23	1.76	1.85	1.70	2.16	2.20	2.20	1.83	1.84	1.90	1.64	1.59	1.72
P07 IT Project Manager	153	61	63	29	49%	51%	2.04	2.03	2.02	1.76	1.64	1.77	1.95	1.97	1.94	1.60	1.61	1.53	1.49	1.38	1.44
P08 IT Systems Analyst	127	64	50	13	56%	44%	1.86	1.82	1.88	2.09	2.13	2.08	1.42	1.26	1.54	1.35	1.26	1.38	1.74	1.69	1.81
P12 IT Security Manager	60	24	35	1	41%	59%	1.82	1.95	1.72	1.62	1.73	1.55	1.89	1.88	1.89	1.66	1.68	1.64	1.99	2.01	1.99
P09 Software Developer	231	104	70	57	60%	40%	1.45	1.39	1.46	1.94	2.00	2.00	1.15	1.04	1.08	1.08	0.95	0.94	1.70	1.71	1.72
P10 Integr. & Testing Engineer	126	51	67	8	43%	57%	1.33	1.25	1.33	2.26	2.28	2.27	0.98	0.93	0.95	0.96	0.87	0.94	1.70	1.73	1.70
P11 IT Systems Architect	85	43	39	3	52%	48%	1.84	1.83	1.83	1.61	1.57	1.64	1.18	1.13	1.16	1.06	1.05	1.02	1.27	1.35	1.16
P13 Database Administrator	68	32	23	13	58%	42%	1.64	1.66	1.53	1.63	1.56	1.56	1.48	1.45	1.36	1.40	1.38	1.24	1.97	1.98	1.97
P14 Network Manager	64	22	26	16	46%	54%	1.66	1.65	1.62	1.71	1.85	1.70	1.43	1.38	1.33	1.42	1.30	1.32	1.92	2.02	1.95
P15 IT Administrator	165	39	71	55	35%	65%	1.63	1.59	1.56	1.62	1.78	1.62	1.40	1.25	1.31	1.45	1.36	1.36	2.32	2.44	2.40
P16 IT Systems Engineer	96	27	32	37	46%	54%	1.57	1.22	1.56	1.70	1.55	1.77	1.41	0.99	1.42	1.34	0.97	1.38	2.18	2.04	2.30
P17 Service Support Manager	163	73	85	5	46%	54%	1.46	1.52	1.38	1.48	1.50	1.46	1.27	1.35	1.18	1.13	1.20	1.03	1.92	1.91	1.94
P18 IT Trainer	157	76	73	8	51%	49%	1.38	1.37	1.35	1.31	1.26	1.33	1.46	1.43	1.44	1.35	1.35	1.30	1.21	1.21	1.18
P01 IT Manager	154	74	74	6	50%	50%	1.98	1.98	1.96	1.02	0.99	1.00	1.98	2.02	1.94	1.70	1.74	1.67	1.11	1.10	1.10
<b>Total</b>					49%	51%	1.68	1.65	1.66	1.68	1.67	1.66	1.51	1.46	1.50	1.38	1.32	1.34	1.69	1.64	1.69
<b>Cases</b>	<b>1918</b>	<b>808</b>	<b>829</b>	<b>281</b>	<b>80%</b>	<b>82%</b>	<b>1918</b>	<b>808</b>	<b>829</b>	<b>1918</b>	<b>808</b>	<b>829</b>	<b>1918</b>	<b>808</b>	<b>829</b>	<b>1918</b>	<b>808</b>	<b>829</b>	<b>1918</b>	<b>808</b>	<b>829</b>
<b>A Cluster A</b>	<b>609</b>	<b>267</b>	<b>269</b>	<b>73</b>	<b>50%</b>	<b>50%</b>	<b>1.90</b>	<b>1.89</b>	<b>1.90</b>	<b>1.79</b>	<b>1.79</b>	<b>1.77</b>	<b>1.82</b>	<b>1.74</b>	<b>1.89</b>	<b>1.59</b>	<b>1.53</b>	<b>1.61</b>	<b>1.65</b>	<b>1.60</b>	<b>1.68</b>
<b>B Cluster B</b>	<b>1155</b>	<b>467</b>	<b>486</b>	<b>202</b>	<b>49%</b>	<b>51%</b>	<b>1.52</b>	<b>1.47</b>	<b>1.48</b>	<b>1.70</b>	<b>1.71</b>	<b>1.71</b>	<b>1.28</b>	<b>1.21</b>	<b>1.22</b>	<b>1.22</b>	<b>1.13</b>	<b>1.14</b>	<b>1.79</b>	<b>1.74</b>	<b>1.79</b>
<b>C Cluster C</b>	<b>154</b>	<b>74</b>	<b>74</b>	<b>6</b>	<b>50%</b>	<b>50%</b>	<b>1.98</b>	<b>1.98</b>	<b>1.96</b>	<b>1.02</b>	<b>0.99</b>	<b>1.00</b>	<b>1.98</b>	<b>2.02</b>	<b>1.94</b>	<b>1.70</b>	<b>1.74</b>	<b>1.67</b>	<b>1.11</b>	<b>1.10</b>	<b>1.10</b>

■ First more relevant KI score per profile  
■ Second more relevant KI score per profile

S = supply  
 D = demand

**Figure 50 - Data Table for Cluster Selection**

The three clusters produced from the analysis suggested some interesting considerations, taking into account that a third was made up of only IT Managers which is, in fact, quite different compared with the other clustered profiles.

To facilitate comparison among the three clusters, we also calculated an aggregated KI per cluster.

The resulting clusters have been named according to their main objective, and we apply the clusters of e-competences to a “socio-technical system” called Systems at Work. The Systems at Work correspond to a number of factors: hardware and software infrastructure and platforms, application portfolio, database contents and operational rules for the IT professional’s organisation, combined to obtain acceptable results.

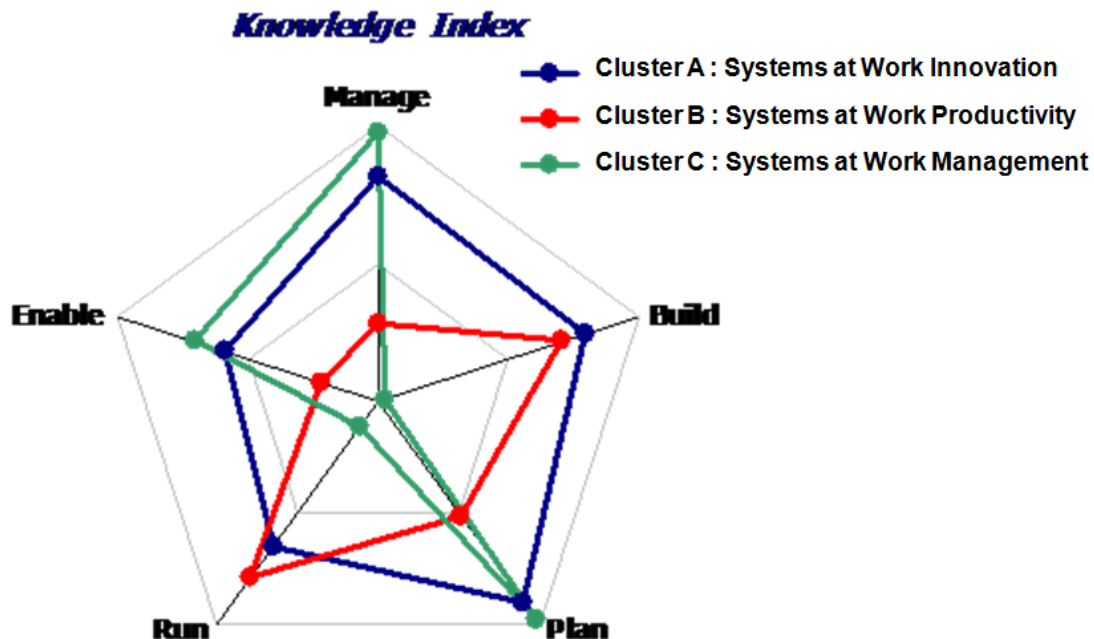
The three clusters are categorised as follows:

- **Cluster A:** Profiles that contribute to *Innovation of Systems at Work*; all of these eight profiles are mainly involved in the Plan and Build areas, focusing on investment in new applications and services. The aggregate KI of cluster A is focused on the Plan area, in the IT demand side, with a high value also in the Manage area.
- **Cluster B:** Profiles that contribute to *Productivity of Systems at Work*; these nine profiles are mainly involved in operations, i.e. in activities focused on the optimisation of the Systems at Work performance, of which productivity of the system could be considered as one of the most important. As for any production process their aggregated KI is concentrated in the Run area, for both IT demand and IT supply sides.
- **Cluster C:** the IT Manager Profile contributes specifically to *Management of Systems at Work* and its KI is correctly balanced between the Manage and Plan areas.



The shape of the KI for the three clusters is very different. Cluster A (profiles that contribute to *Innovation of Systems at Work*) has a mean level of e-competences in all five areas, with higher KI in the Plan and Manage areas, and lower KI in the Enable area.

On the contrary, Cluster B (profiles that contribute to *Productivity of Systems at Work*) has deeper competencies in the Build area and especially in Run area, while a clearly lower level of e-competence is evident in the Manage and Enable areas. The third cluster, Cluster C (IT Manager) has an acutely angular shape: with the highest KI in the Manage, Plan and Enable areas and the lowest KI in the Run and Build areas.



**Figure 51 – Knowledge Index of Clusters**

The following chart shows the difference in KI between IT professionals working in the supply or demand side of the IT industry. No differences have been found for the Plan and Build areas among the three clusters, and for cluster B (profiles that contribute to *Productivity of Systems at Work*) only a small difference in the Run area emerges, where professionals working in the demand side of the IT industry have a slightly deeper competence than their colleagues in the IT supply side in the Run area.

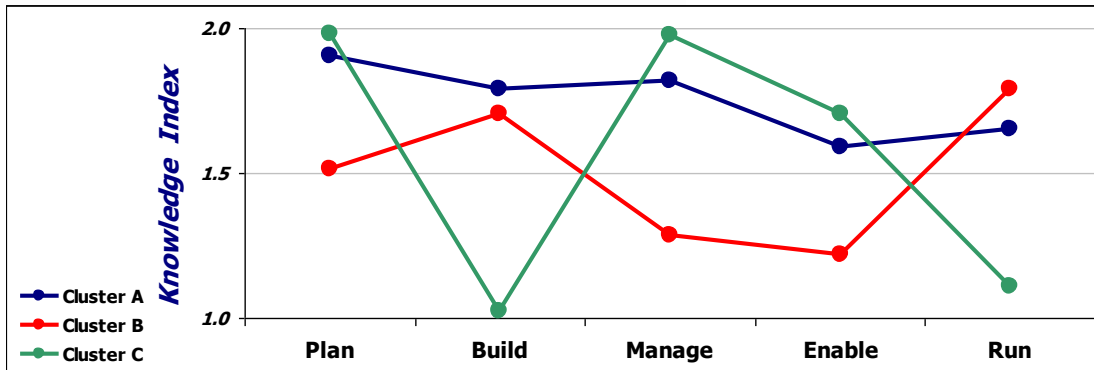


Figure 52 - Knowledge Index by Cluster

A different situation emerges for Cluster C: IT Managers working in the IT supply side seem to have higher level of competence in the Manage and Enable areas than IT Managers working in the IT demand side. The most remarkable differences have been found within Cluster A (profiles that contribute to *Innovation of Systems at Work*). IT professionals working in organisations on the demand side registered Knowledge Indexes in the Enable and Run areas of about 5%-6% higher than their colleagues from the supply side; this kind of difference increases to 8% for their Knowledge Index in the Manage area.

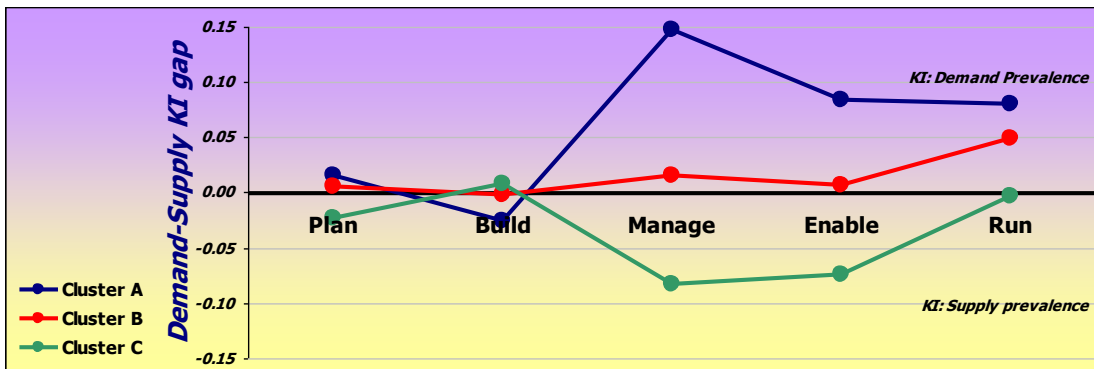


Figure 53 - Knowledge Index - Supply and Demand Differences

The segmentation per demographics and clustering analysis above cannot be compared to any existing European report data. This is the first analysis we are aware of that goes into this level of detail of analysis of e-competences and profiles and can therefore be considered to be a pioneering study. These results will also have strong potential in guiding future work on the e-CF and eJobs profiles projects of the CEN ICT Skills workshop.



## 7 Conclusions and Recommendations

### 7.1 Conclusions

The data gathered in this round of CEPIS Survey proves a high level of interest from professionals around Europe in reflecting on their own e-competences and their profile. From a statistical point of view, the results need to be tackled with care, as the sample of voluntary respondents who accepted the invitation from their national informatics association of the CEPIS Member Society network could prove to be biased and not representative of the total national community of IT professionals.

CEPIS and its Member Societies note the value of continuing this research to ensure an even wider and more representative sample for future statistical analysis. The current research offers some useful results including:

- **Profile popularity:** The three most popular proximity profiles were Software Developer (231 respondents), IT Administrator (165), and Service Support Manager (163) and the three least popular proximity profiles were IT Client Manager (51), Business Analyst (45), and IT Applications Consultant (41).
- **Low response from young IT professionals:** With only 16.8% of respondents within the under 30 age bracket, there is a clear need to further promote the IT profession among young people to ensure adequate supply of upcoming IT professionals.
- **Female representation in IT is still very low:** There is still a high degree of imbalance in the representation of women in IT. While the survey results noted a large number of female IT Trainer respondents (41%), this is the highest level of gender equity of all the profiles. The overall female proportion of 16% across Europe is disappointing and some profiles falls as low as only 5%.
- **Potential “profile clusters” emerge:** The survey analysis points to the creation of three IT profile clusters, namely profiles that contribute to (i) *Innovation of Systems at Work*, (ii) *Productivity of Systems at Work* or (iii) *Management of Systems at Work*. These clusters can for the basis for metrics to evaluate and categorise profiles in future and can offer a top-level view of the strengths of Europe’s IT workforce.
- **IT professionals have a high level of formal education but often not in IT:** 79% of respondents have achieved at least a degree level qualification, showing the importance of third level qualifications in gaining employment in the IT sector. 51.1% of respondents have either a Masters or a PhD qualification. 63% of those surveyed stated that IT was the main focus of their education highlighting that just under a third of IT professionals have come from a non IT-focused background. This may be due to a lack of supply of suitably qualified IT professionals to meet market needs, but these findings also show that there is a need for defined career paths.



- **IT offers stable full-time employment:** Even in the current challenging economic climate, the vast majority of respondents (87%) hold full time positions and only 3.6% were either students, retired or unemployed showing the great potential for stable employment in the IT sector.
- **Profiles can be seen to be “Junior” and “Senior”, allowing young IT professionals to pick a logical career starting point:** The oldest age profile for a role was the IT Manager (average age 46.7) and the Integration & Testing Engineer, at 38.2 years old on average, was the youngest among the IT profiles. Other roles that were considered as “senior” roles included Business Analyst, IT Quality Manager & Auditor, IT Project Manager and IT Applications Consultant while we can consider IT Systems Architect, Integration & Testing Engineer, IT Systems Engineer and IT Administrator as “junior” profiles.
- **High participation of large organisations:** 34% of respondents came from organisations with 1000+ employees. This figure contrasts with previous European studies that indicate that around 99% of European companies are SMEs<sup>20</sup>. SME’s however may not hire dedicated IT professionals in-house, although they rely heavily on IT for their success.
- **Less than half of IT Managers have an IT education:** The IT Manager is the most non IT-focused profile in Europe. Only 48% of IT Managers have an education where IT is the main focus.
- **Low Knowledge Index results point to a need for competence development:** The overall Knowledge Index results ranged from 1.68 out of 3.00 for Run to as low as 1.38 out of 3.00 for Enable e-competences. The relative lower level result for the Enable Knowledge Index can be specifically attributed to insufficient coverage of four e-competences, namely Sales Proposal Development, Channel Management, Sales Management and Contract Management, all related to the Marketing and Sales area of the Enable e-competences. An in-depth analysis of the Knowledge Indexes compared to each profile requirement is fundamental in order to design detailed training paths to cover the e-competence gaps for each proximity profile of each respondent.

The response rate and the findings provide useful indicators of IT professional competence (and e-competence gaps) in the market, they represent the first pan-European application of the European e-Competence Framework and demonstrate its utility. The findings also give rise to a number of recommendations which can guide the vision of a roadmap to ensure that IT does not hinder Europe’s productivity growth.

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<sup>20</sup> [http://epp.eurostat.ec.europa.eu/cache/ITY\\_OFFPUB/KS-SF-08-031/EN/KS-SF-08-031-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-08-031/EN/KS-SF-08-031-EN.PDF)



## 7.2 Recommendations

Based on the findings, the following key recommendations are proposed:

- **Promote the IT profession among young people:** Further initiatives are necessary to **promote the IT profession among young people** to ensure that enterprises will have the talent necessary to innovate and compete. To increase the supply of new IT professionals, coordinated action is needed between education providers, informatics associations and industry and support is required from governments and the European Commission. Awareness raising programmes such as e-Skills week are a good first step and should be repeated annually with a strong focus on attracting the younger generation. The European e-Skills and Careers portal, an initiative of the European e-Skills Association<sup>21</sup> is an example of stakeholders working together towards this aim, but should be further developed to extend its reach.
- **Redress the gender imbalance in all countries:** Urgent measures are needed to redress the gender imbalance in all countries and increase the participation of women in ICT careers. The continuation and expansion of existing initiatives that focus on role models and mentoring programmes should be replicated and scaled up. Member States should provide fiscal incentives for companies that adopt gender equity as part of their organisational culture, hiring practices and career advancement programmes.
- **Continuous Professional Development must play an important role:** The low Knowledge Index returns suggest that continuous professional development can add value for professionals. While most IT professionals are highly educated (79% of respondents have at least a degree qualification), 47% do not have IT-focused education. These professionals could benefit from supplementing their knowledge and e-competences through the completion of IT certifications. For example, over half of IT Managers lack education that is oriented to IT. A related project on developing an ICT Professionalism Framework for European and training programme for ICT managers is one example of a good initiative in this area.<sup>22</sup>
- **Apply e-CF as a pan-European tool to categorise competences and identify competence gaps:** In the application of the e-CF as the base for this assessment, it has become clear that this is a practical tool with value in categorising and defining IT competences. The work of the CEN Workshop on IT skills is commended in this respect and we recommend that the e-CF is continually developed and disseminated across Europe. The e-CF is a key tool to facilitate the identification and analysis of e-competences.

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<sup>21</sup> <http://eskillsassociation.eu>

<sup>22</sup> The project is ongoing and carried out by CEPIS and IVI on behalf of the European Commission, Enterprise and Industry Directorate-General.  
<http://cepis.org/index.jsp?p=827&n=940>



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- Evaluation of these results by the project team of the CEN Workshop on ICT Skills, and in particular the e-Jobs Profiles project, since the results on profile relevance and popularity may be of use in determining future upgrades to the e-Job Profiles.

Finally, CEPIS will endeavour to continue to promote the e-CF based assessment tool used in this Survey of Professional e-Competence in Europe to ensure wider participation across Europe for future analysis. Please see [www.cepis.org](http://www.cepis.org) for updates.



## 8 Annex

### 8.1 Description of Additional Segmentation

The research has been conducted via an e-CF-based web assessment tool. To enhance the differentiation of the 18 profiles gathered, an additional segmentation of eight more ICT competencies have been added to the basic core of 36 as outlined here below.

European e-Competence Framework 2.0	CEPIS Survey of Professional e-Competence in Europe
B.1. Design and Development	B.1a. Design and Development (Infrastructure and Software Environment)
	B.1b. Design and Development (Data Model and Application Logics)
	B.1c. Design and Development (User Interfaces)
B.2. Systems Integration	B.2a. Systems Integration (Configuration and Performance Control)
	B.2b. Systems Integration (Package Selection and Customization)
C.4. Problem Management	C.4a. Problem Management (Process)
	C.4b. Problem Management (Network Operation)
	C.4c. Problem Management (Computer System Operation)
	C.4d. Problem Management (Database Administration)
	C.4e. Problem Management (Application Maintenance)
D.9. Personnel Development	D.9a. Personnel Development (e-Competence Analysis)
	D.9b. Personnel Development (Resource Management)

This additional segmentation has proven valuable in improving the uniqueness of each job profile.

For instance, all responses prior to 11/2/2011 were analysed, and in this sample only 20 respondents had identified themselves as Network Managers in initial stages (before entering the detailed questionnaire): 17 of them got a proximity value to the same profile in the range of 51% to 100%, whilst the remaining three got values between 0 and 18% (0 may indicate that they did not complete the questionnaire); therefore, these three respondents were discarded from the average value calculation.



Self-declared	E-CF 2.0 (core)		enhanced e-CF	
	Network Mgr	DB Admin	Network Mgr	DB Admin
Managers	80.81%	78.08%	80.65%	50.47%
1	4%	3%	6%	4%
2	97%	94%	98%	60%
3	83%	87%	88%	79%
4	77%	55%	81%	33%
5	75%	70%	84%	74%
6	100%	98%	100%	89%
7	95%	84%	95%	76%
8	99%	98%	100%	89%
9	98%	78%	99%	45%
10	92%	89%	99%	77%
11	64%	65%	18%	19%
12	65%	74%	62%	12%
13	70%	64%	63%	18%
14	88%	84%	83%	45%
15	0%	0%	0%	0%
16	86%	74%	81%	12%
17	58%	81%	54%	35%
18	61%	70%	58%	25%
19	54%	67%	51%	21%
20	76%	60%	75%	69%

Results with the “enhanced e-CF Segmentation” are shown in columns 4 & 5 of the above table:

- 80.65% average proximity to the Network Manager profile
- 50.47% average proximity to the Database Administrator profile

This means that a Network Manager normally does not have all detailed e-competences to act as a good Database Administrator.

Columns 2 & 3 show simulated results of data processing with the original set of 36 e-CF e-competences:

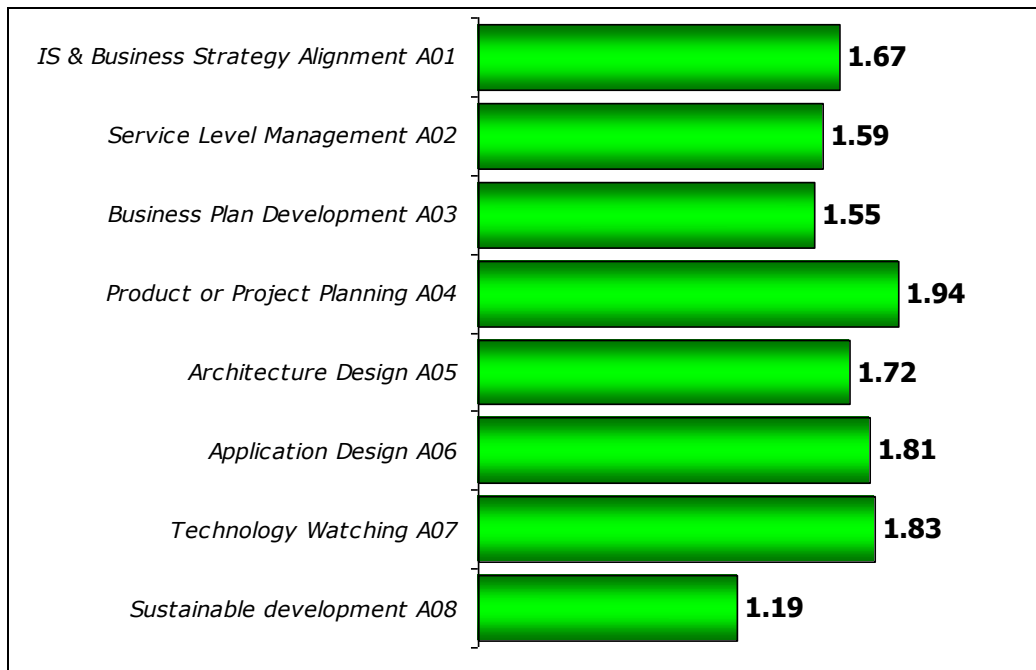
- 80.81% proximity to the Network Manager profile (Similar to the previous result)
- 78.08% proximity to the Database Administrator profile

In this case, the Database Administrator profile can hardly be distinguished from the Network Manager profile (as it appears that they require nearly the same set of "core" e-CF e-competences). This shows that if we do not split different technology contents of the various e-competences, we are not able to differentiate between some technical profiles.

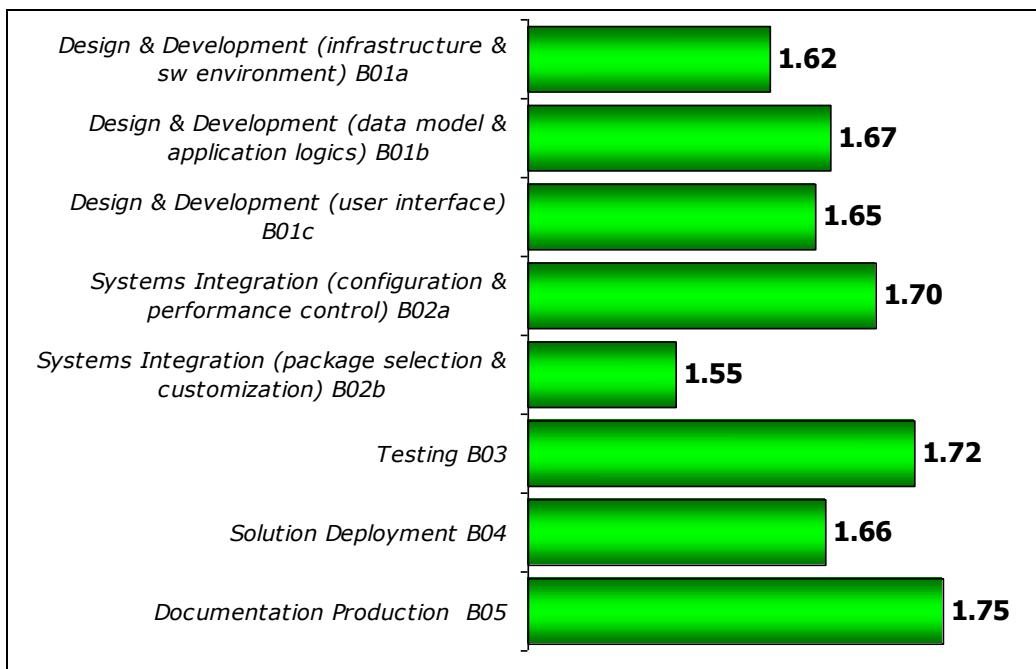


## 8.2 IT Competence – Knowledge Index

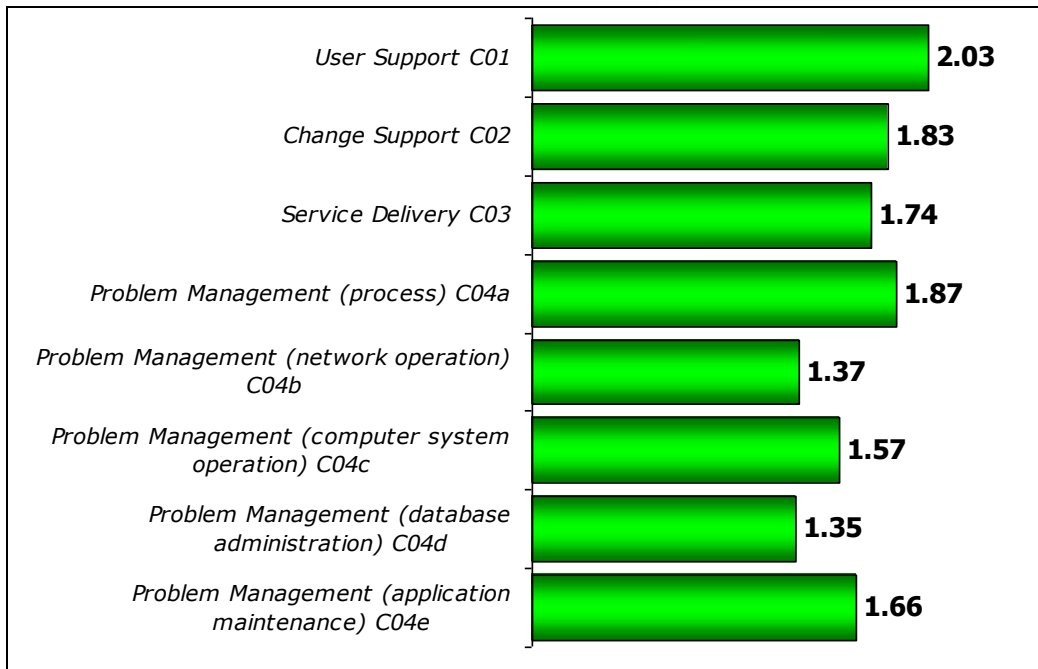
### 8.2.1 Knowledge Indexes for Elementary Skills



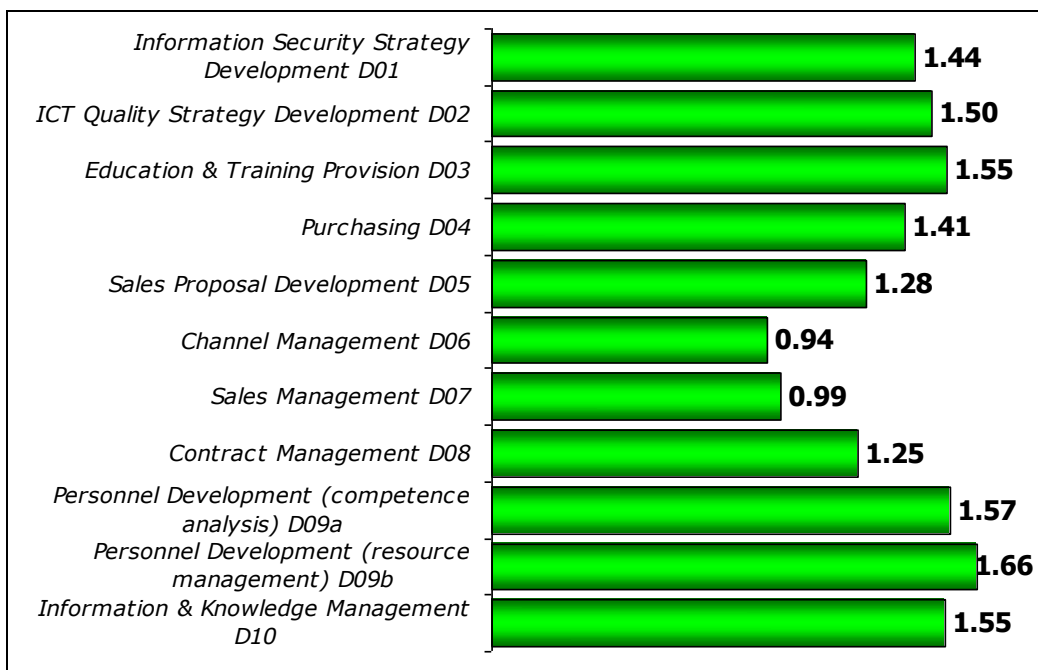
**Figure A1 – IT Competence – Knowledge Index – Plan**



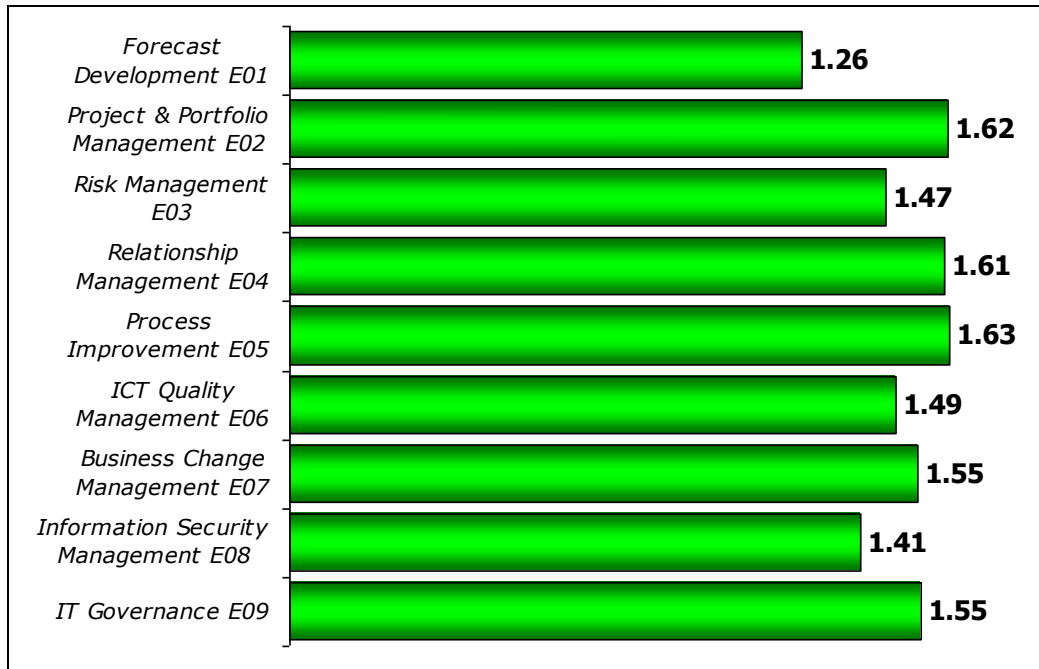
**Figure A2 – IT Competence – Knowledge Index – Build**



**Figure A3 – IT Competence – Knowledge Index – Run**

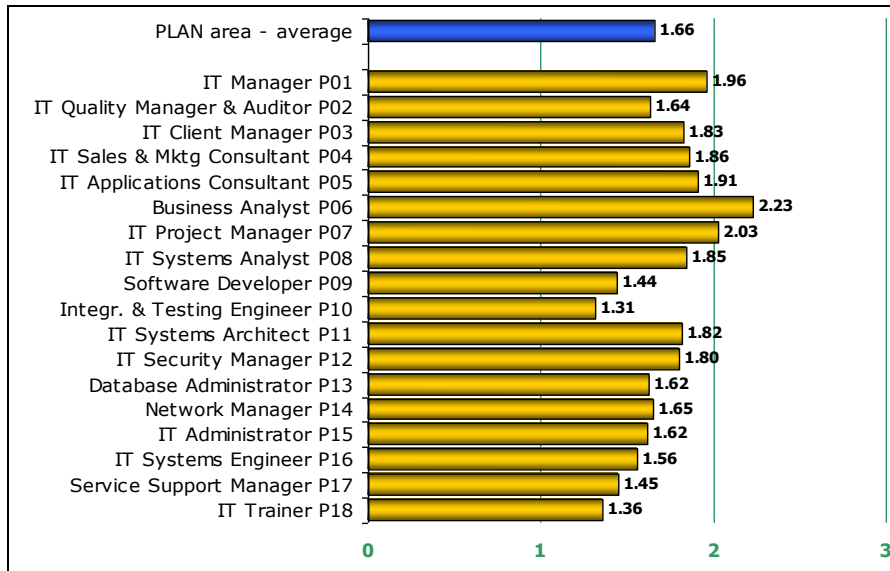


**Figure A4 – IT Competence – Knowledge Index – Enable**

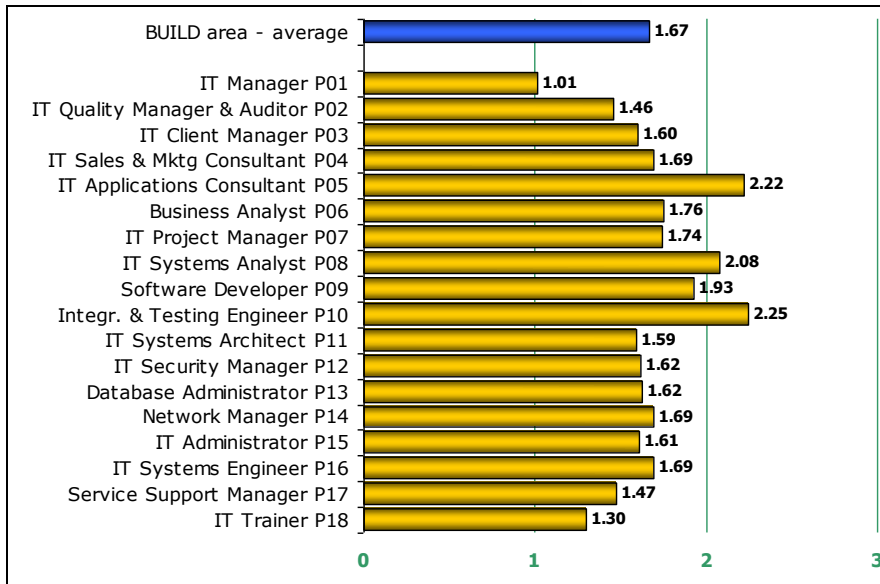


**Figure A5 – IT Competence – Knowledge Index – Manage**

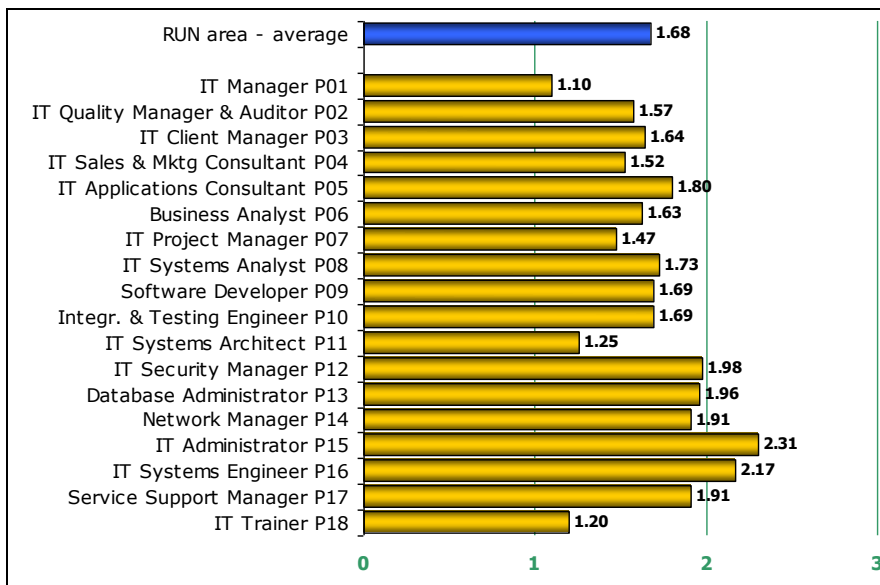
### 8.2.2 Knowledge Indexes by IT Profile



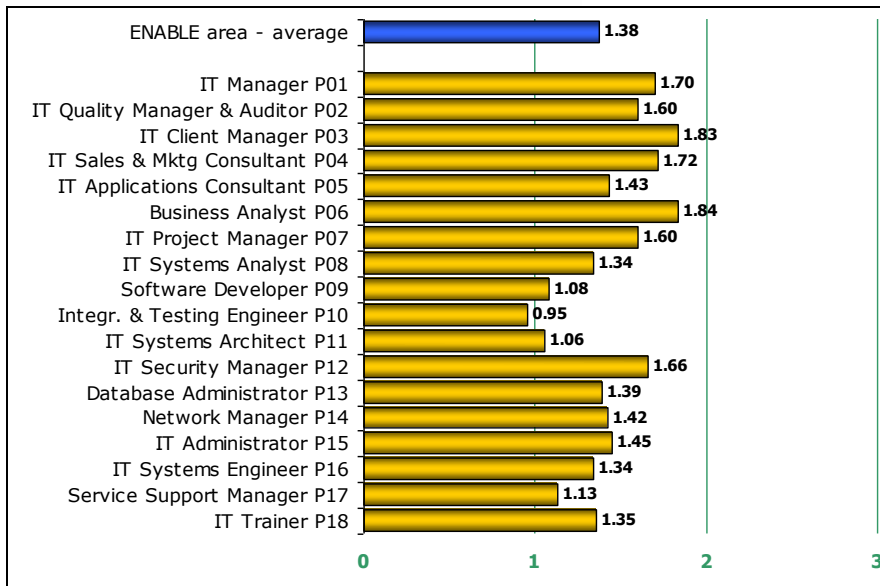
**Figure B1 – IT Competence – Knowledge Index – Plan**



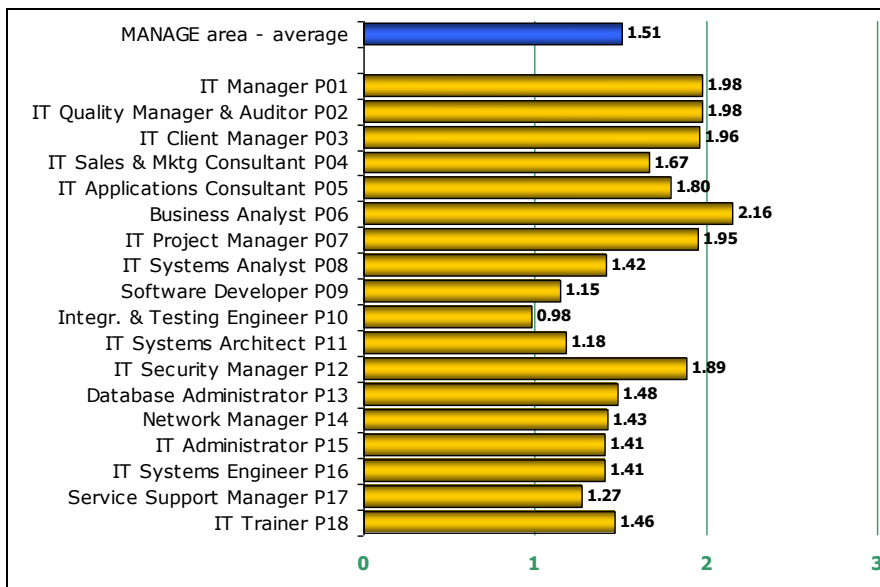
**Figure B2 – IT Competence – Knowledge Index – Build**



**Figure B3 – IT Competence – Knowledge Index – Run**



**Figure B4 – IT Competence – Knowledge Index – Enable**

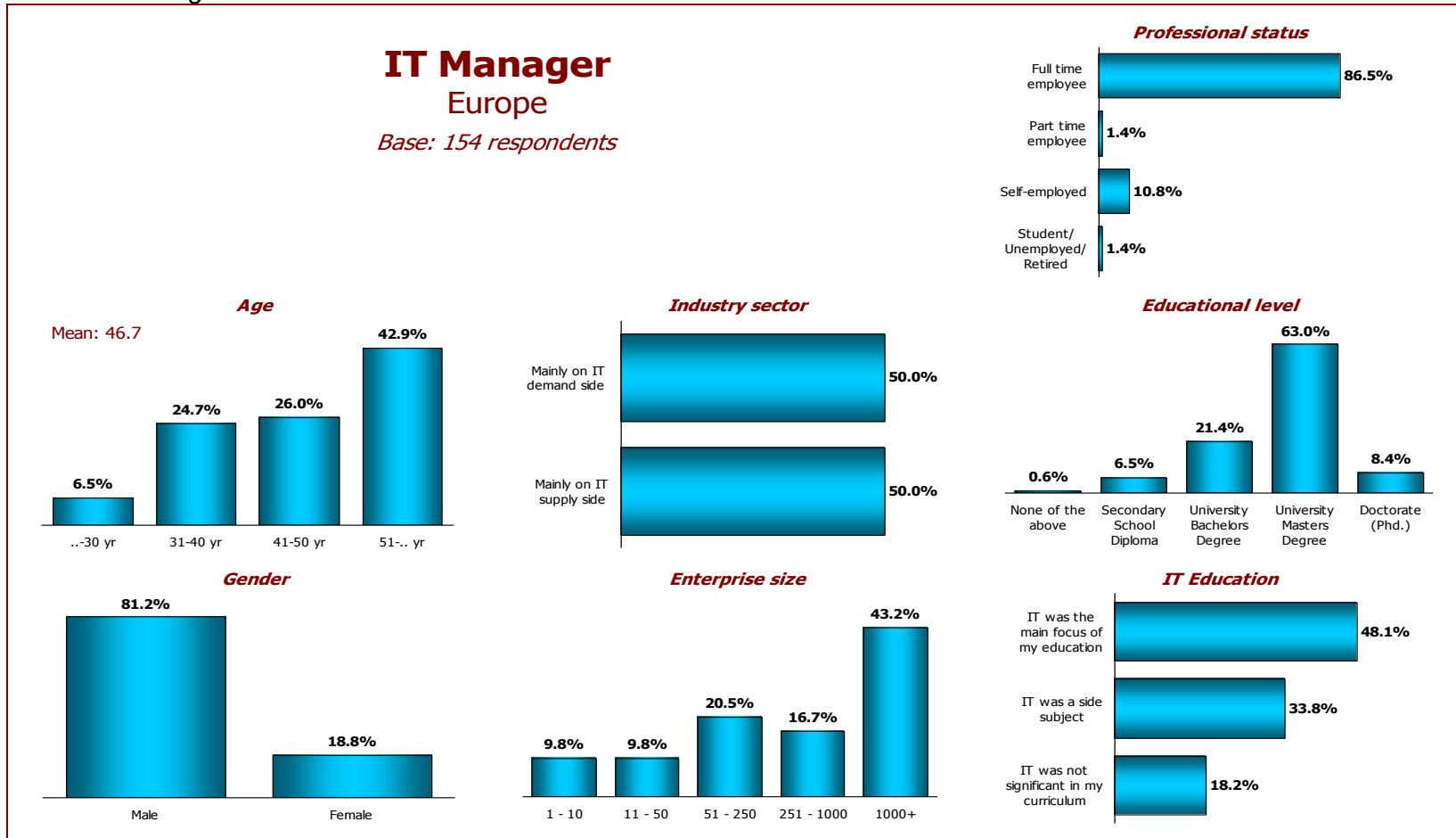


**Figure B5 – IT Competence – Knowledge Index – Manage**



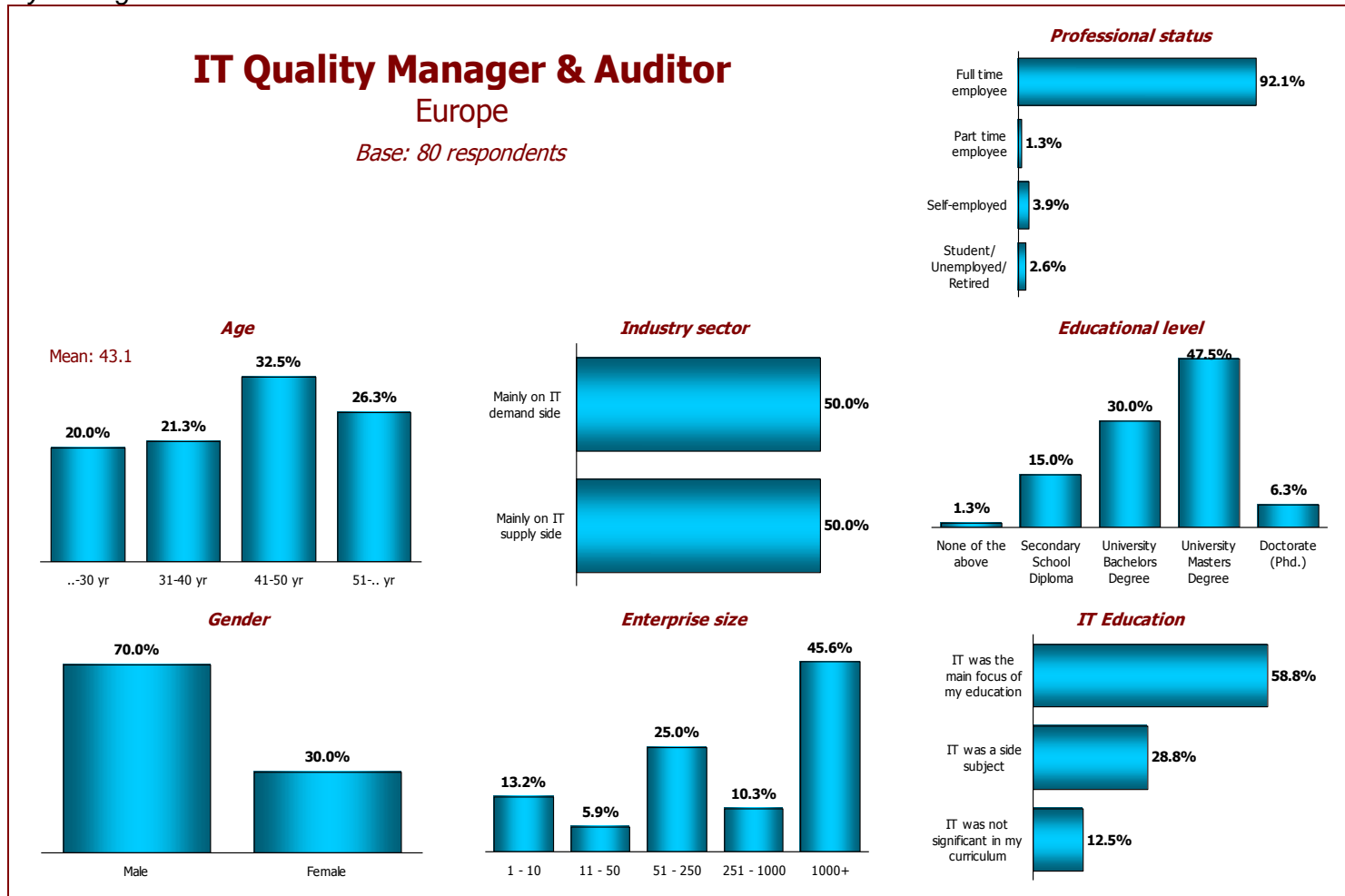
### 8.3 Proximity Profiles – Detail

#### 8.3.1 IT Manager



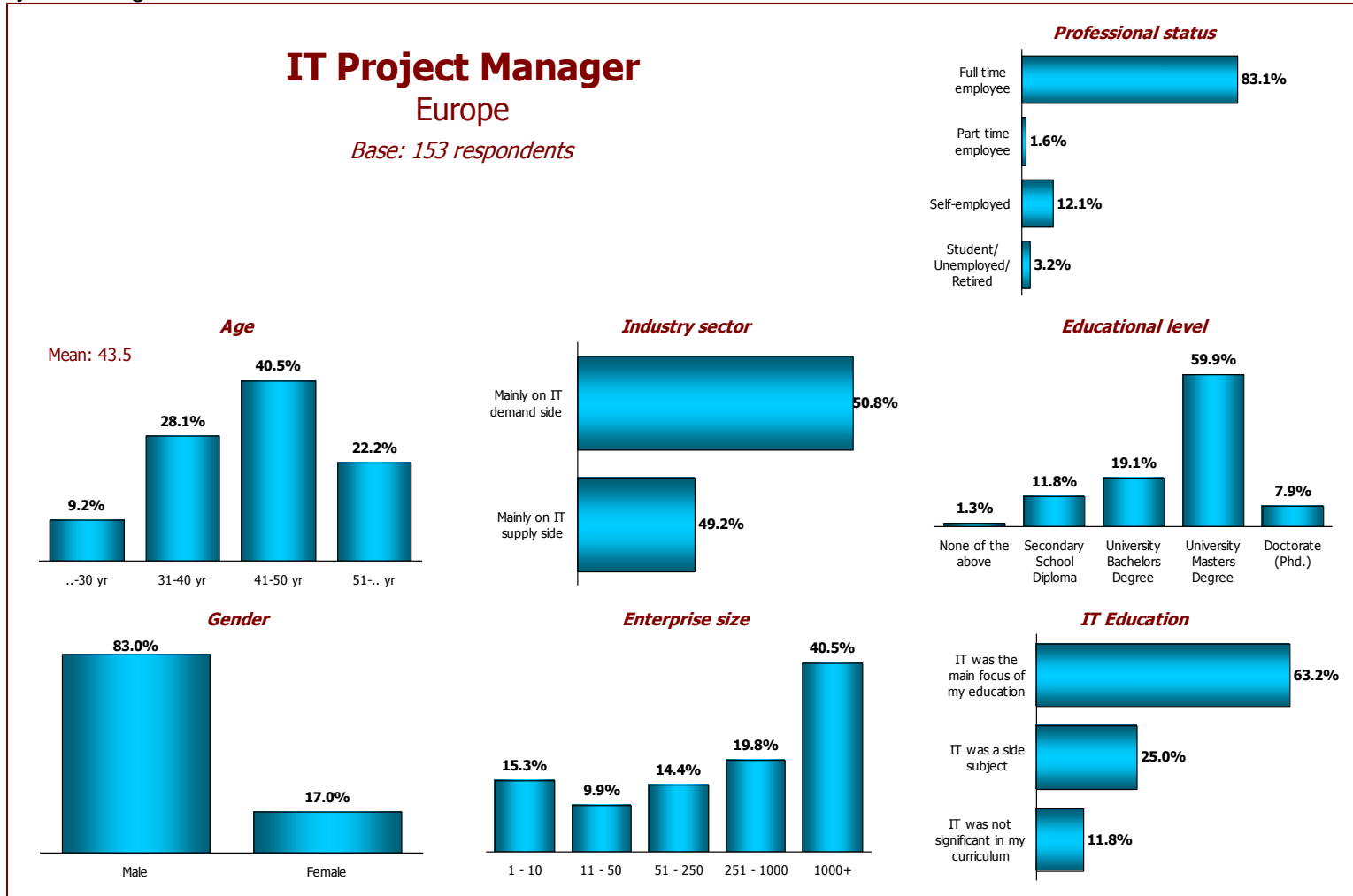


8.3.2 IT Quality Manager & Auditor



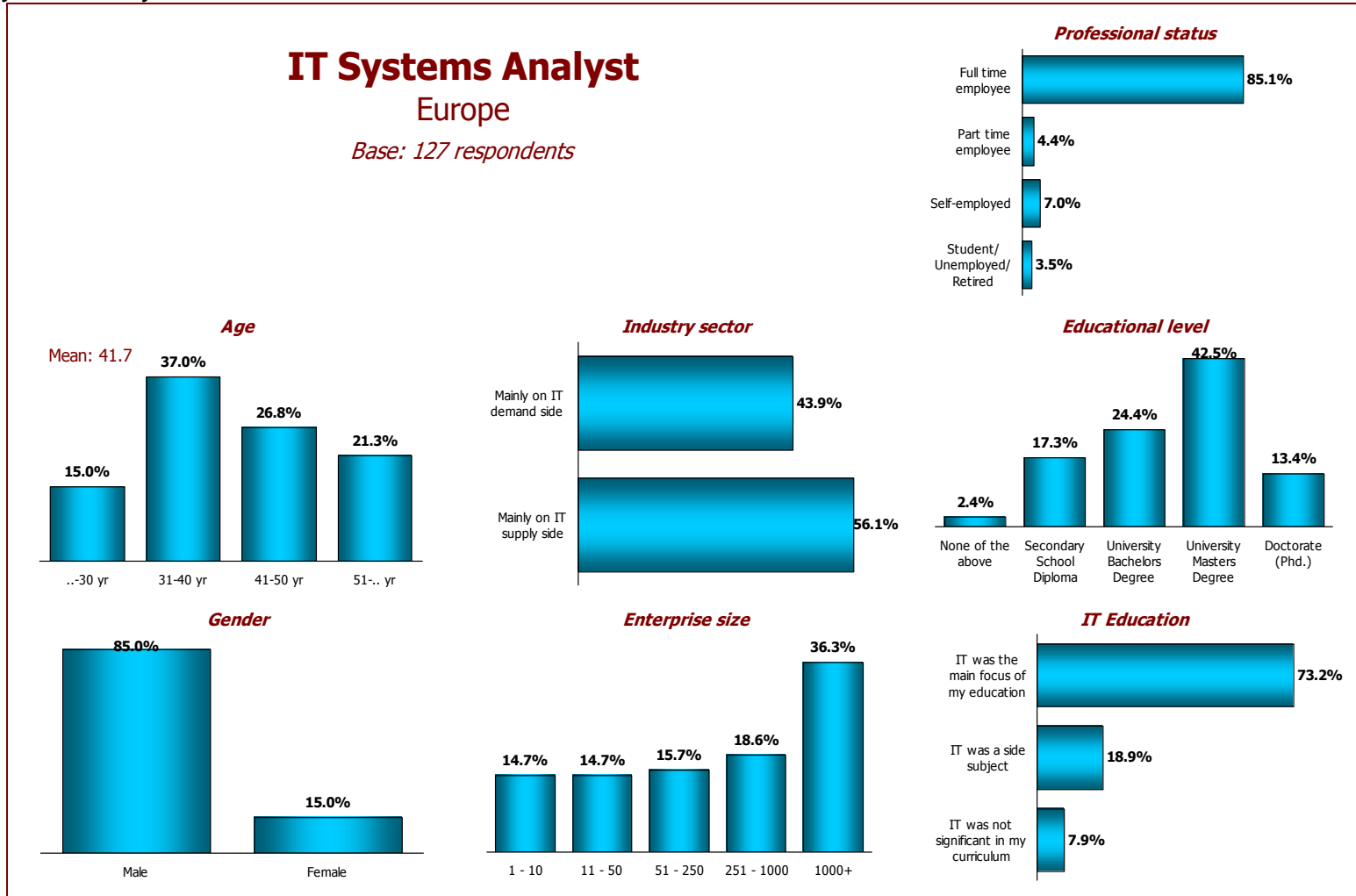


### 8.3.3 IT Project Manager



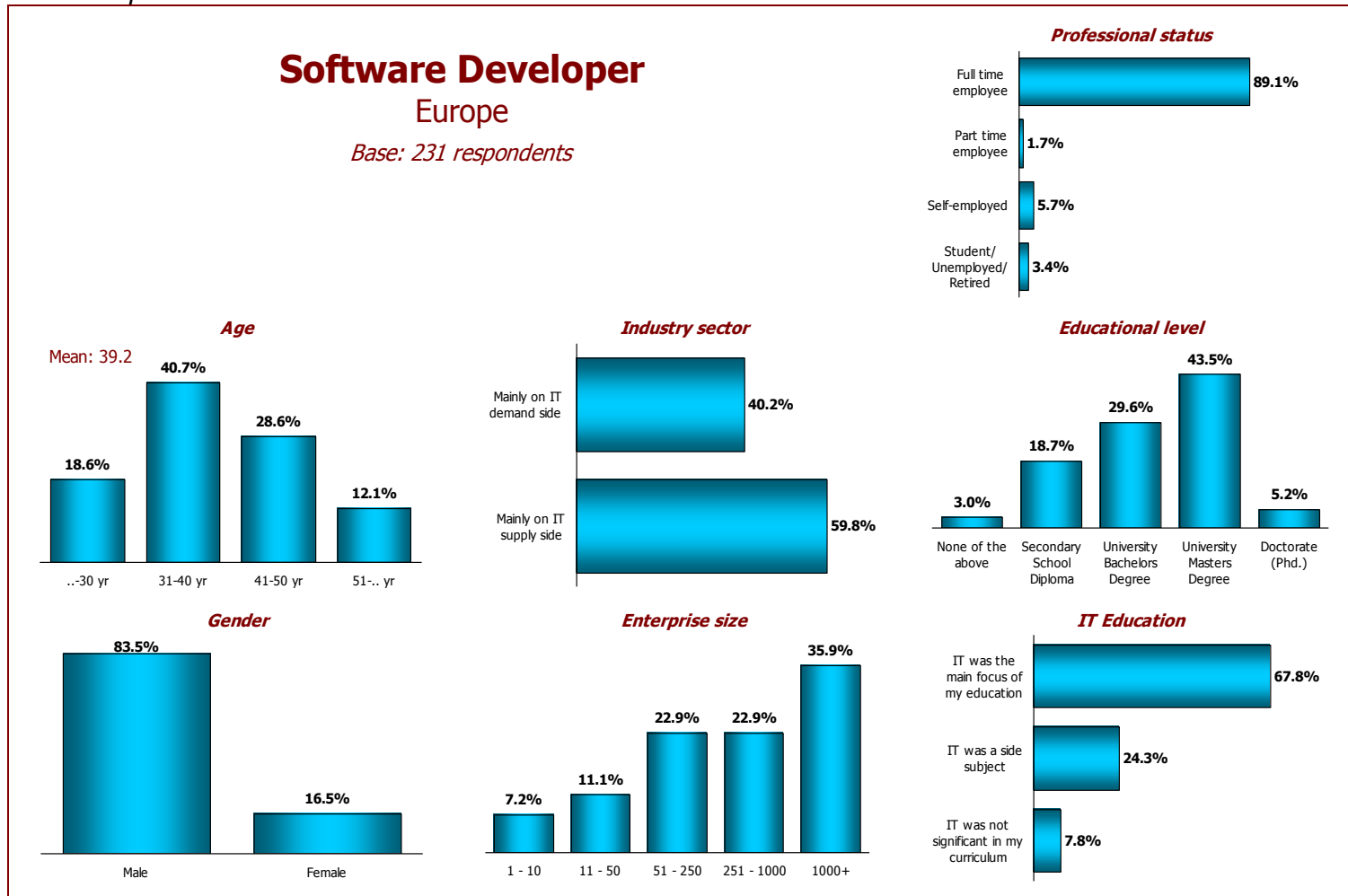


8.3.4 IT Systems Analyst



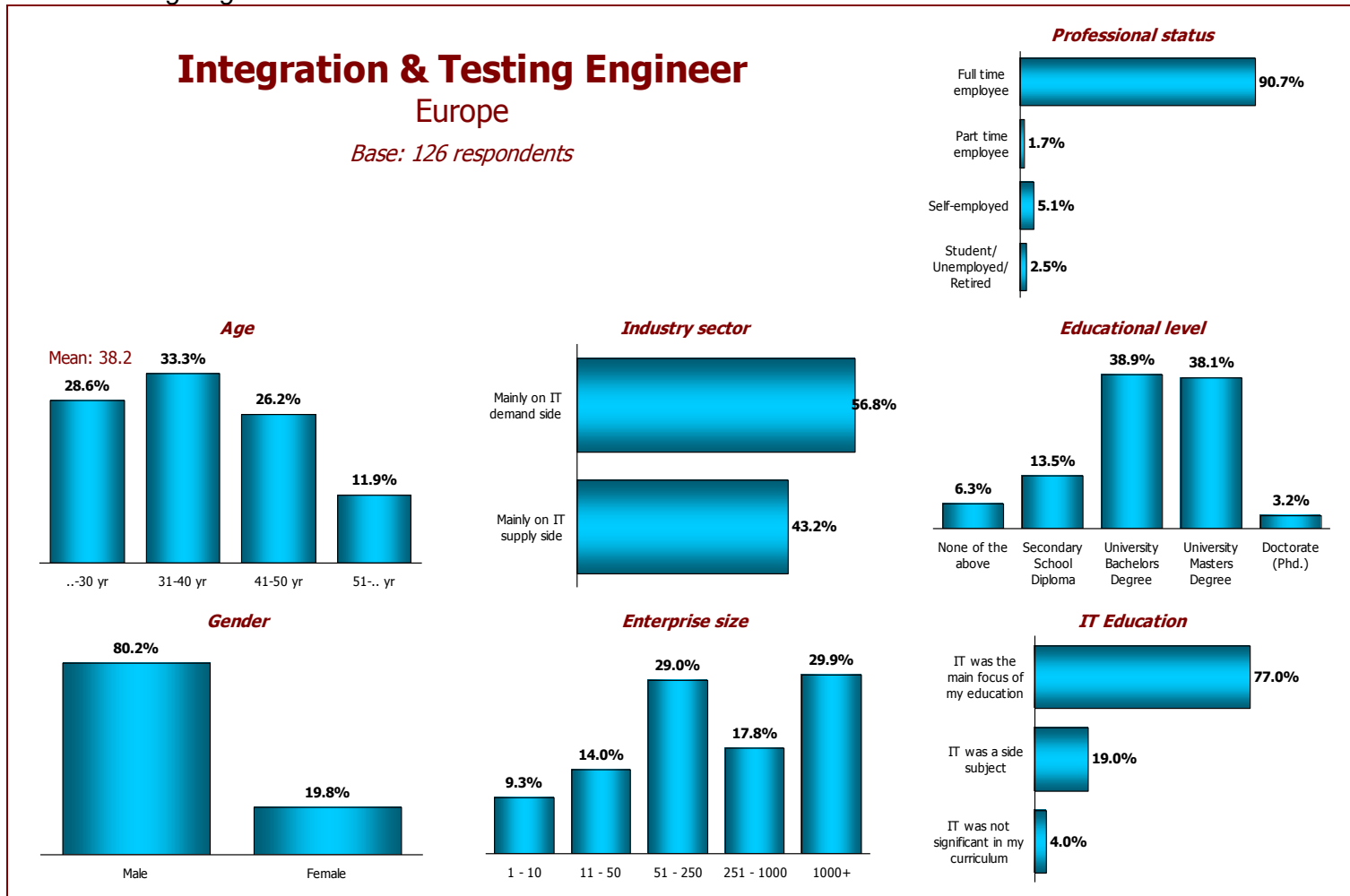


### 8.3.5 Software Developer



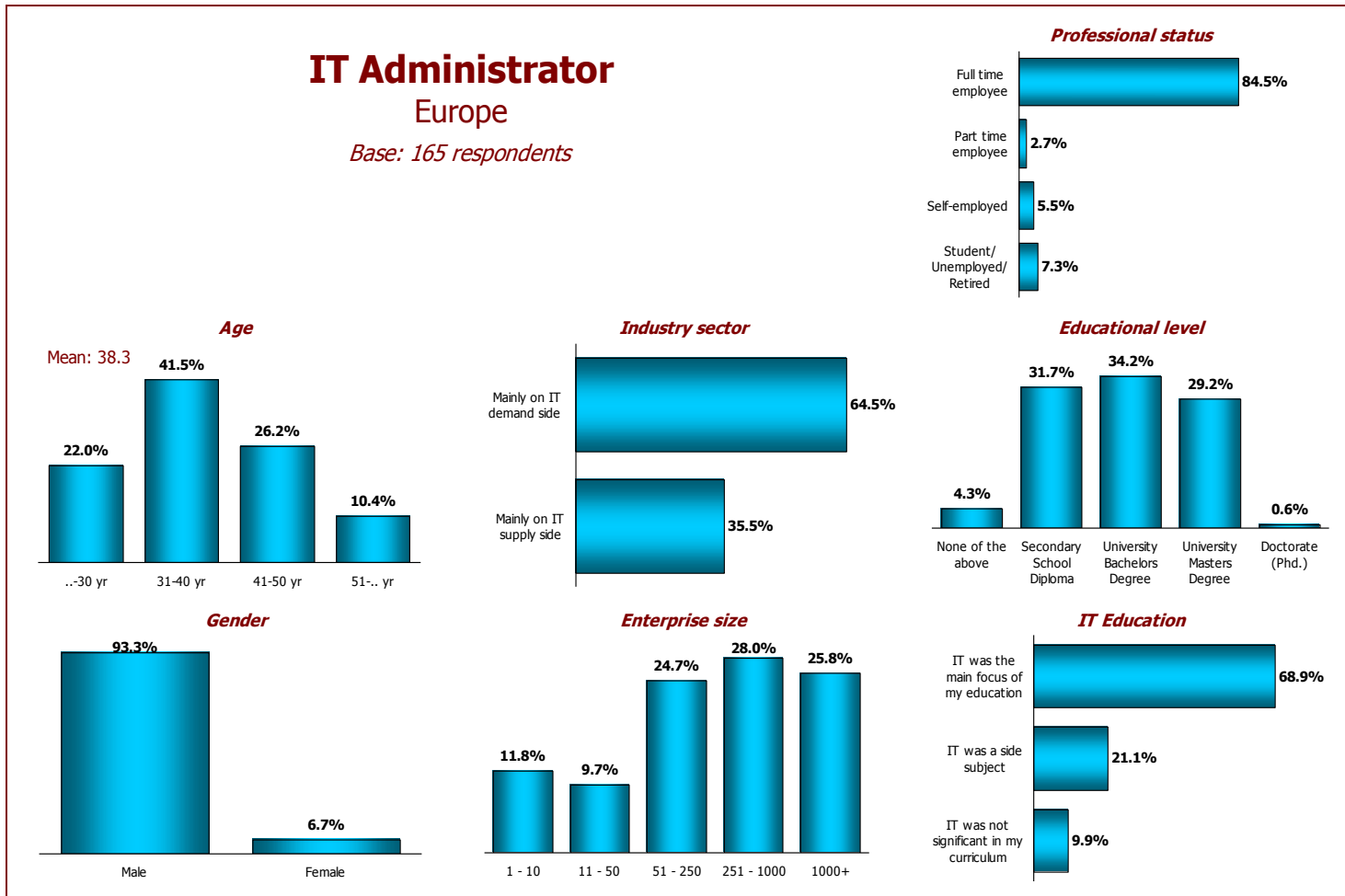


### 8.3.6 Integration & Testing Engineer



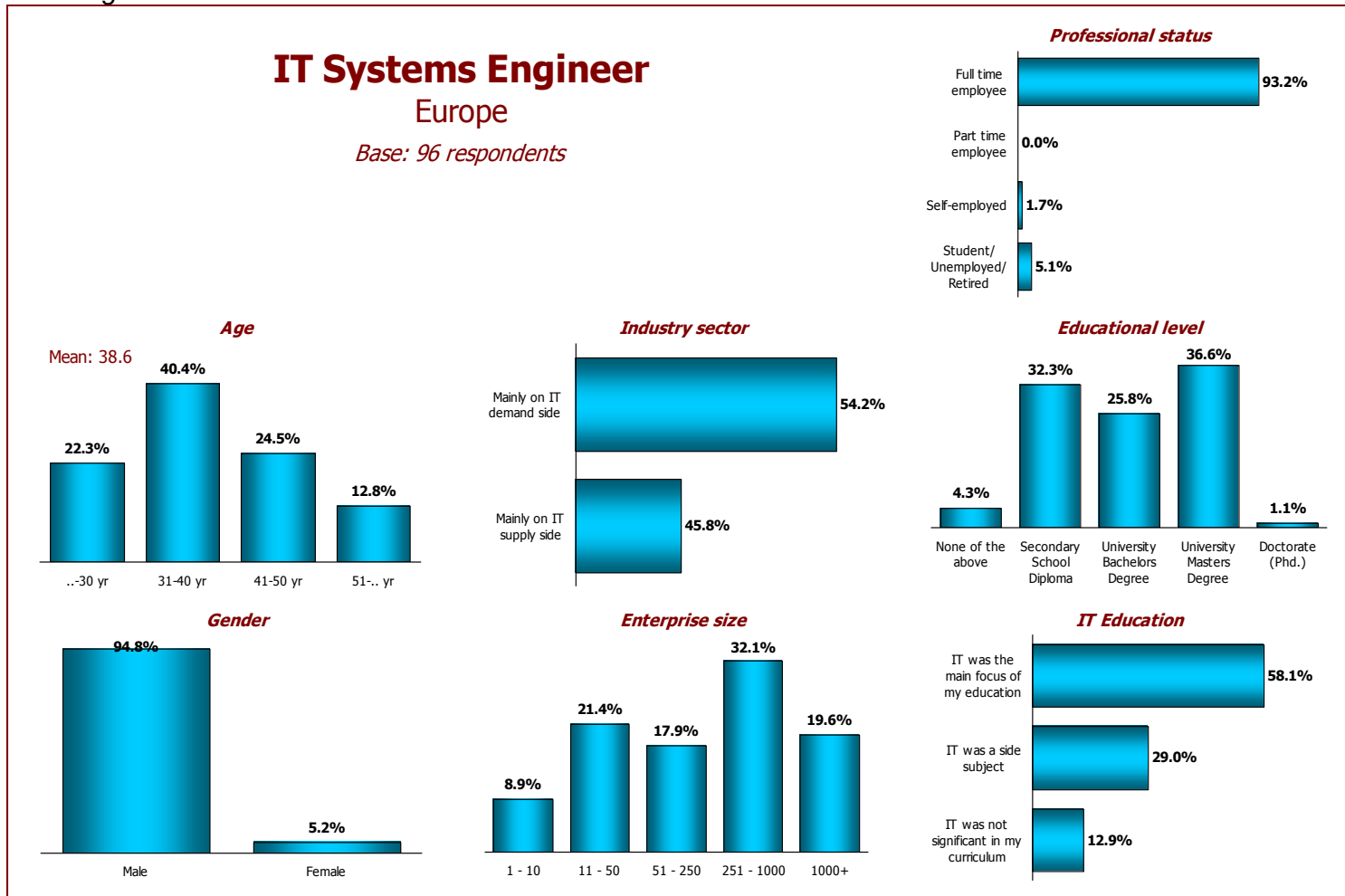


### 8.3.7 IT Administrator



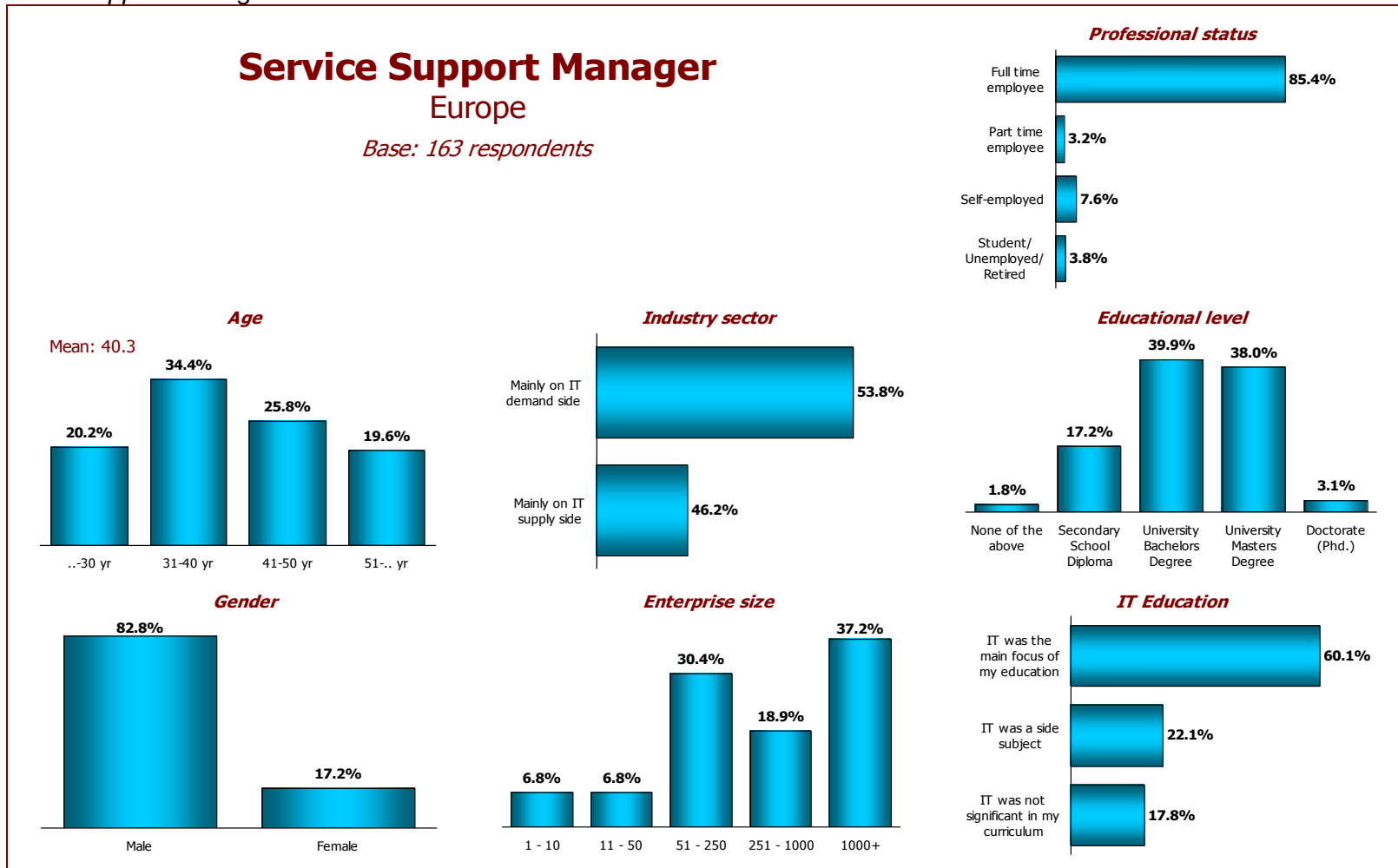


8.3.8 IT Systems Engineer



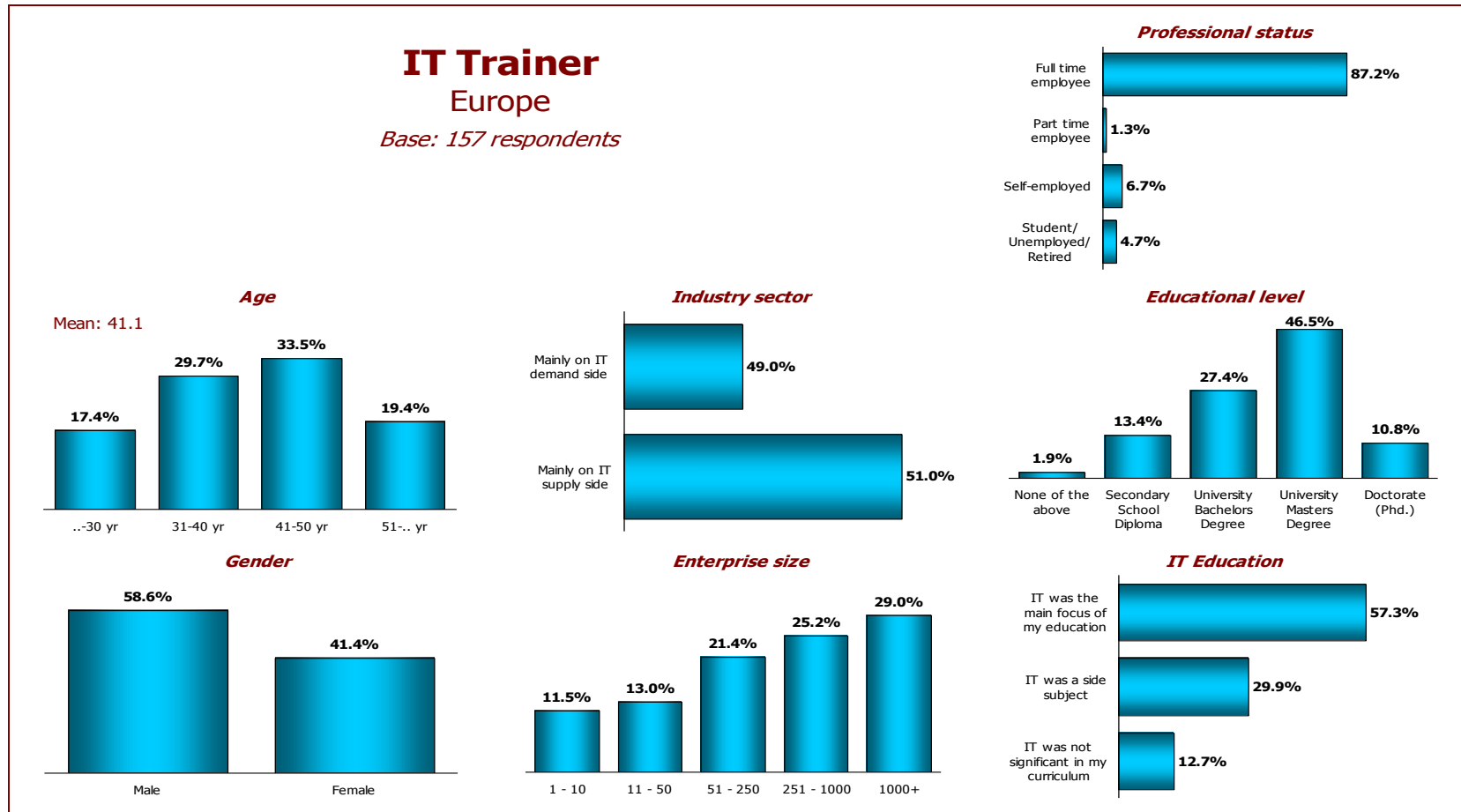


8.3.9 Service Support Manager





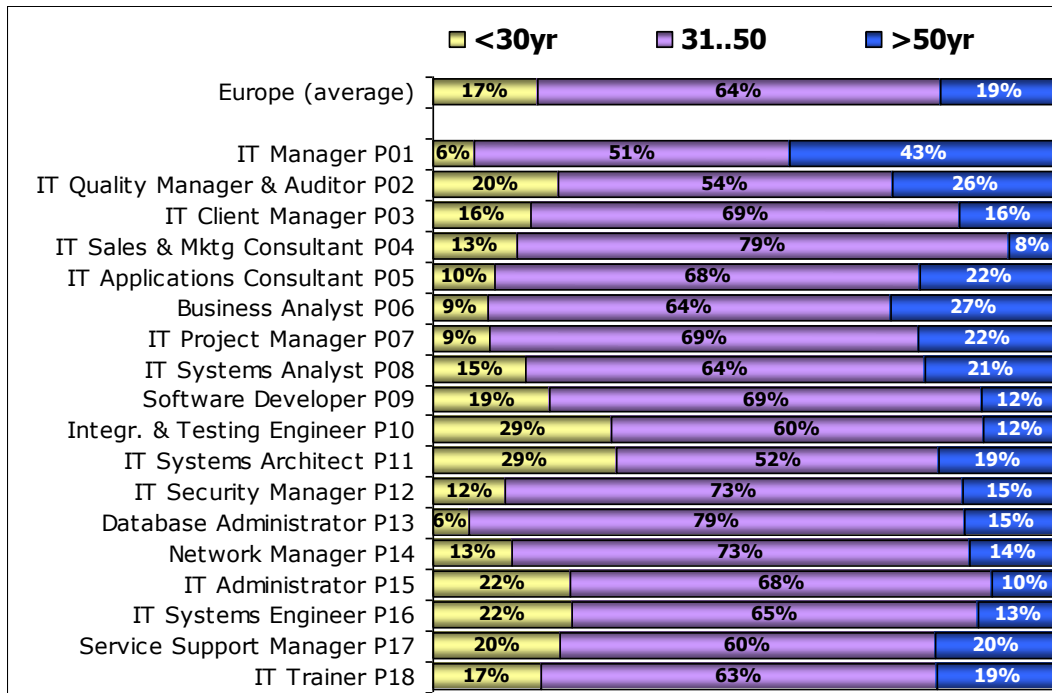
8.3.10 IT Trainer





## 8.4 Profile Segmentation

### 8.4.1 Profile Distribution by Age

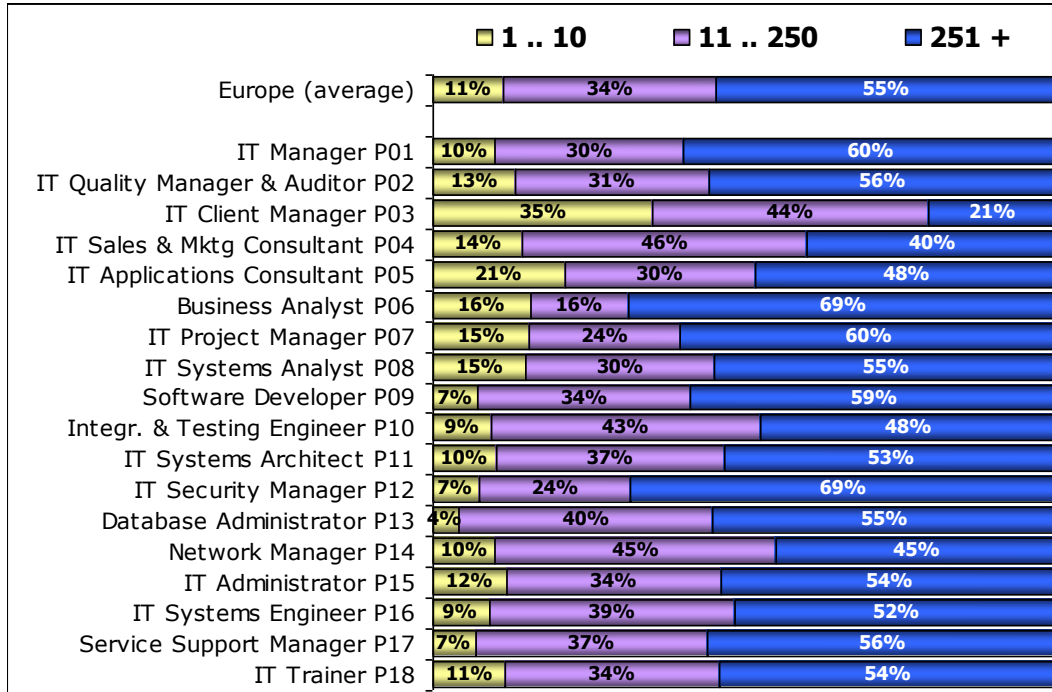


by Age	Europe (% by profile)				Europe (% by segment)			
	Total	..-30 yr	31-50 yr	51-.. yr	Total	..-30 yr	31-50 yr	51-.. yr
P01 IT Manager	8%	3%	6%	18%	100%	6%	51%	43%
P02 IT Quality Manager & Auditor	4%	5%	3%	6%	100%	20%	54%	26%
P03 IT Client Manager	3%	2%	3%	2%	100%	16%	69%	16%
P04 IT Sales & Mktg Consultant	3%	2%	3%	1%	100%	13%	79%	8%
P05 IT Applications Consultant	2%	1%	2%	3%	100%	10%	68%	22%
P06 Business Analyst	2%	1%	2%	3%	100%	9%	64%	27%
P07 IT Project Manager	8%	4%	9%	9%	100%	9%	69%	22%
P08 IT Systems Analyst	7%	6%	7%	8%	100%	15%	64%	21%
P09 Software Developer	12%	13%	13%	8%	100%	19%	69%	12%
P10 Integration & Testing Engineer	7%	11%	6%	4%	100%	29%	60%	12%
P11 IT Systems Architect	4%	8%	4%	4%	100%	29%	52%	19%
P12 IT Security Manager	3%	2%	4%	3%	100%	12%	73%	15%
P13 Database Administrator	4%	1%	4%	3%	100%	6%	79%	15%
P14 Network Manager	3%	2%	4%	3%	100%	13%	73%	14%
P15 IT Administrator	9%	11%	9%	5%	100%	22%	68%	10%
P16 IT Systems Engineer	5%	7%	5%	3%	100%	22%	65%	13%
P17 Service Support Manager	9%	10%	8%	9%	100%	20%	60%	20%
P18 IT Trainer	8%	8%	8%	8%	100%	17%	63%	19%
<b>Total cases</b>	<b>1913</b>	<b>322</b>	<b>1232</b>	<b>359</b>	<b>100%</b>	<b>17%</b>	<b>64%</b>	<b>19%</b>

(note: the profiles to be analysed are those satisfying the condition of having 10 respondents or more)



### 8.4.2 Profile Distribution by Enterprise Size

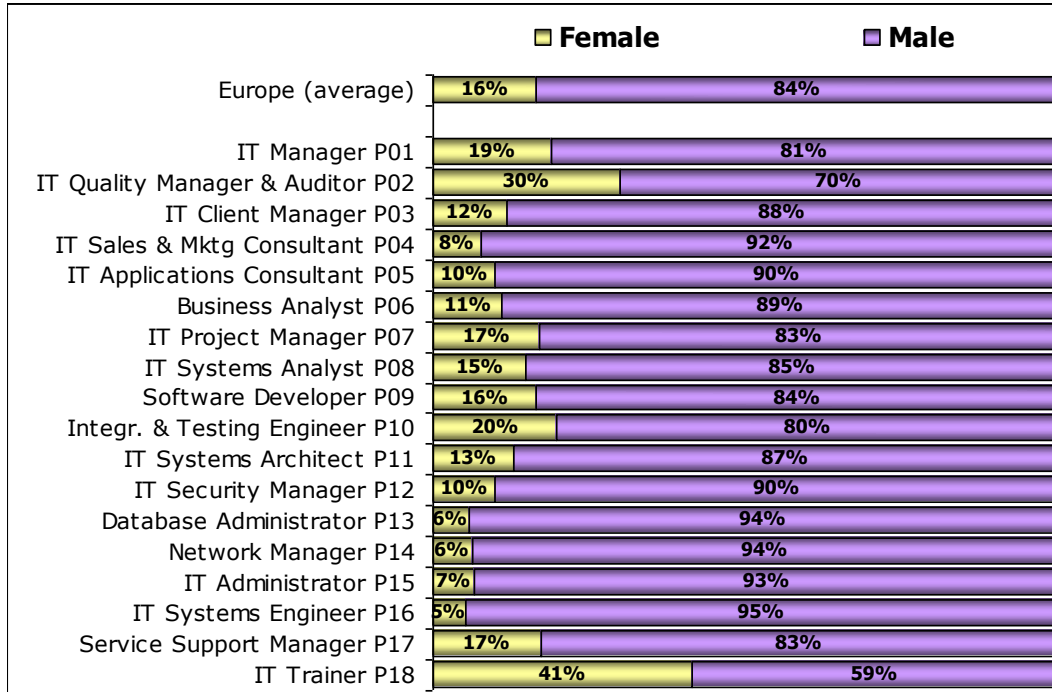


by Enterprise size	Europe (% by profile)				Europe (% by segment)			
	Total	1 .. 10	11 .. 250	251 +	Total	1 .. 10	11 .. 250	251 +
P01 IT Manager	9%	8%	8%	10%	100%	10%	30%	60%
P02 IT Quality Manager & Auditor	5%	6%	4%	5%	100%	13%	31%	56%
P03 IT Client Manager	2%	7%	3%	1%	100%	35%	44%	21%
P04 IT Sales & Mktg Consultant	2%	3%	3%	2%	100%	14%	46%	40%
P05 IT Applications Consultant	2%	4%	2%	2%	100%	21%	30%	48%
P06 Business Analyst	2%	3%	1%	3%	100%	16%	16%	69%
P07 IT Project Manager	8%	10%	5%	8%	100%	15%	24%	60%
P08 IT Systems Analyst	7%	9%	6%	7%	100%	15%	30%	55%
P09 Software Developer	11%	7%	10%	11%	100%	7%	34%	59%
P10 Integration & Testing Engineer	7%	6%	9%	6%	100%	9%	43%	48%
P11 IT Systems Architect	5%	5%	6%	5%	100%	10%	37%	53%
P12 IT Security Manager	4%	2%	3%	5%	100%	7%	24%	69%
P13 Database Administrator	3%	1%	4%	3%	100%	4%	40%	55%
P14 Network Manager	3%	2%	4%	2%	100%	10%	45%	45%
P15 IT Administrator	6%	7%	6%	6%	100%	12%	34%	54%
P16 IT Systems Engineer	4%	3%	4%	4%	100%	9%	39%	52%
P17 Service Support Manager	10%	6%	11%	10%	100%	7%	37%	56%
P18 IT Trainer	9%	9%	9%	9%	100%	11%	34%	54%
<b>Total cases</b>	<b>1455</b>	<b>163</b>	<b>496</b>	<b>796</b>	<b>100%</b>	<b>11%</b>	<b>34%</b>	<b>55%</b>

(note: the profiles to be analysed are those satisfying the condition of having 10 respondents or more)



### 8.4.3 Profile Distribution by Gender

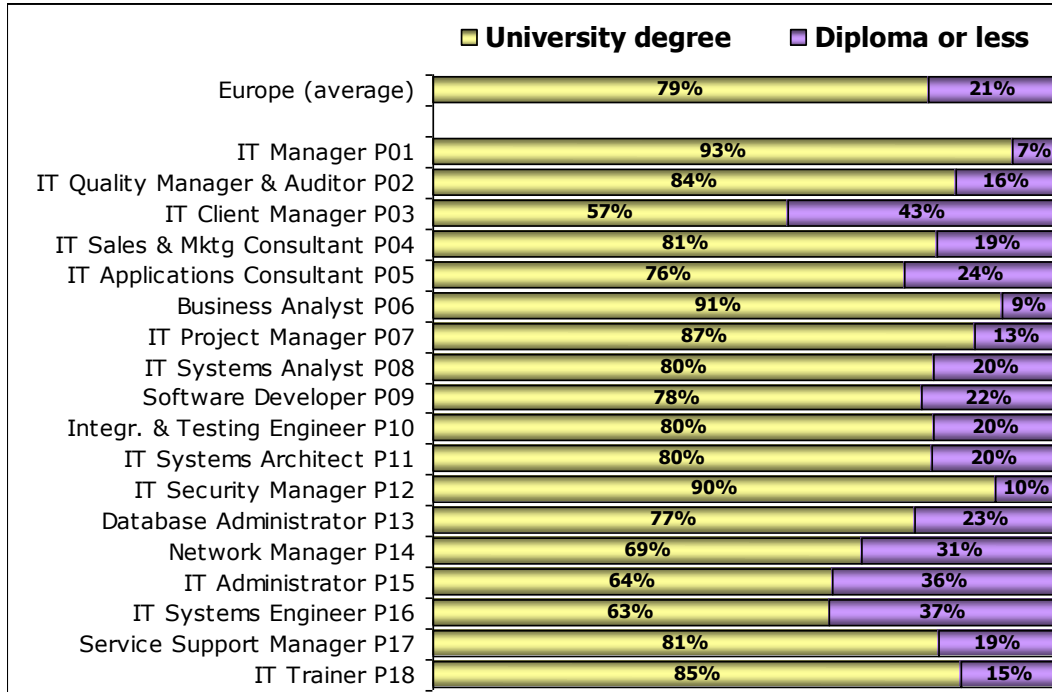


by Gender	Europe (% by profile)			Europe (% by segment)		
	Total	Female	Male	Total	Female	Male
P01 IT Manager	8%	9%	8%	100%	19%	81%
P02 IT Quality Manager & Auditor	4%	8%	3%	100%	30%	70%
P03 IT Client Manager	3%	2%	3%	100%	12%	88%
P04 IT Sales & Mktg Consultant	3%	1%	3%	100%	8%	92%
P05 IT Applications Consultant	2%	1%	2%	100%	10%	90%
P06 Business Analyst	2%	2%	2%	100%	11%	89%
P07 IT Project Manager	8%	8%	8%	100%	17%	83%
P08 IT Systems Analyst	7%	6%	7%	100%	15%	85%
P09 Software Developer	12%	12%	12%	100%	16%	84%
P10 Integration & Testing Engineer	7%	8%	6%	100%	20%	80%
P11 IT Systems Architect	4%	4%	5%	100%	13%	87%
P12 IT Security Manager	3%	2%	3%	100%	10%	90%
P13 Database Administrator	4%	1%	4%	100%	6%	94%
P14 Network Manager	3%	1%	4%	100%	6%	94%
P15 IT Administrator	9%	4%	10%	100%	7%	93%
P16 IT Systems Engineer	5%	2%	6%	100%	5%	95%
P17 Service Support Manager	8%	9%	8%	100%	17%	83%
P18 IT Trainer	8%	21%	6%	100%	41%	59%
<b>Total cases</b>	<b>1918</b>	<b>314</b>	<b>1604</b>	<b>100%</b>	<b>16%</b>	<b>84%</b>

(note: the profiles to be analysed are those satisfying the condition of having 10 respondents or more)



#### 8.4.4 Profile Distribution by Educational Level

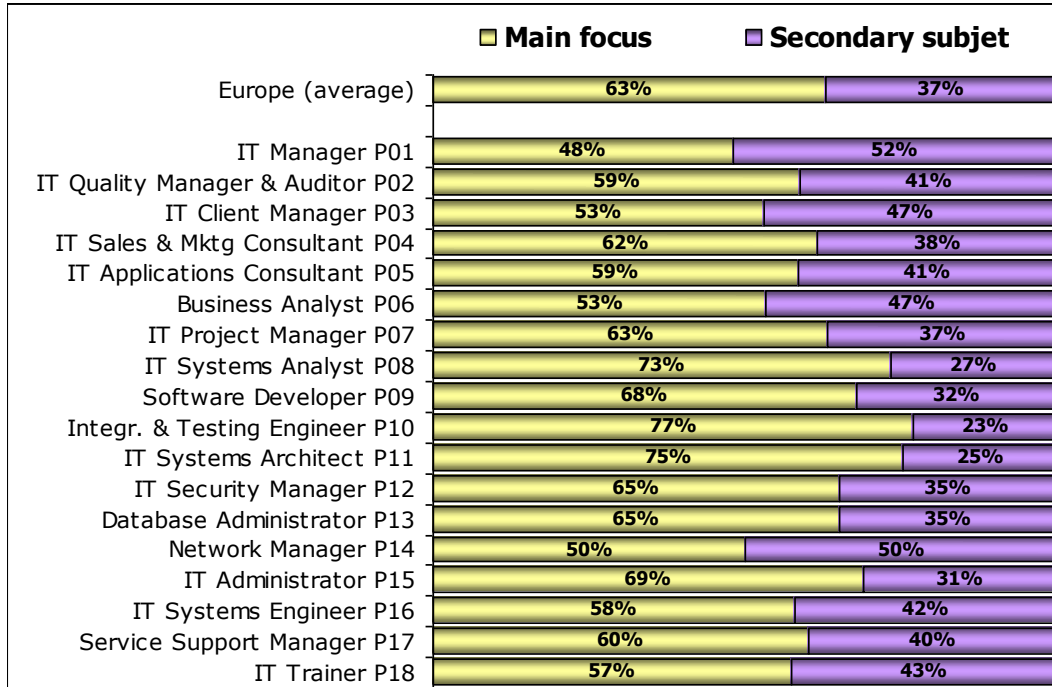


by Education Level	Europe (% by profile)			Europe (% by segment)		
	Total	Secondary & other	University	Total	Secondary & other	University
P01 IT Manager	8%	3%	9%	100%	7%	93%
P02 IT Quality Manager & Auditor	4%	3%	4%	100%	16%	84%
P03 IT Client Manager	3%	6%	2%	100%	43%	57%
P04 IT Sales & Mktg Consultant	3%	3%	3%	100%	19%	81%
P05 IT Applications Consultant	2%	3%	2%	100%	24%	76%
P06 Business Analyst	2%	1%	3%	100%	9%	91%
P07 IT Project Manager	8%	5%	9%	100%	13%	87%
P08 IT Systems Analyst	7%	6%	7%	100%	20%	80%
P09 Software Developer	12%	13%	12%	100%	22%	78%
P10 Integration & Testing Engineer	7%	6%	7%	100%	20%	80%
P11 IT Systems Architect	4%	4%	4%	100%	20%	80%
P12 IT Security Manager	3%	2%	4%	100%	10%	90%
P13 Database Administrator	3%	4%	3%	100%	23%	77%
P14 Network Manager	3%	5%	3%	100%	31%	69%
P15 IT Administrator	8%	15%	7%	100%	36%	64%
P16 IT Systems Engineer	5%	9%	4%	100%	37%	63%
P17 Service Support Manager	9%	8%	9%	100%	19%	81%
P18 IT Trainer	8%	6%	9%	100%	15%	85%
<b>Total cases</b>	<b>1907</b>	<b>395</b>	<b>1512</b>	<b>100%</b>	<b>21%</b>	<b>79%</b>

(note: the profiles to be analysed are those satisfying the condition of having 10 respondents or more)



### 8.4.5 Profile Distribution by IT Education

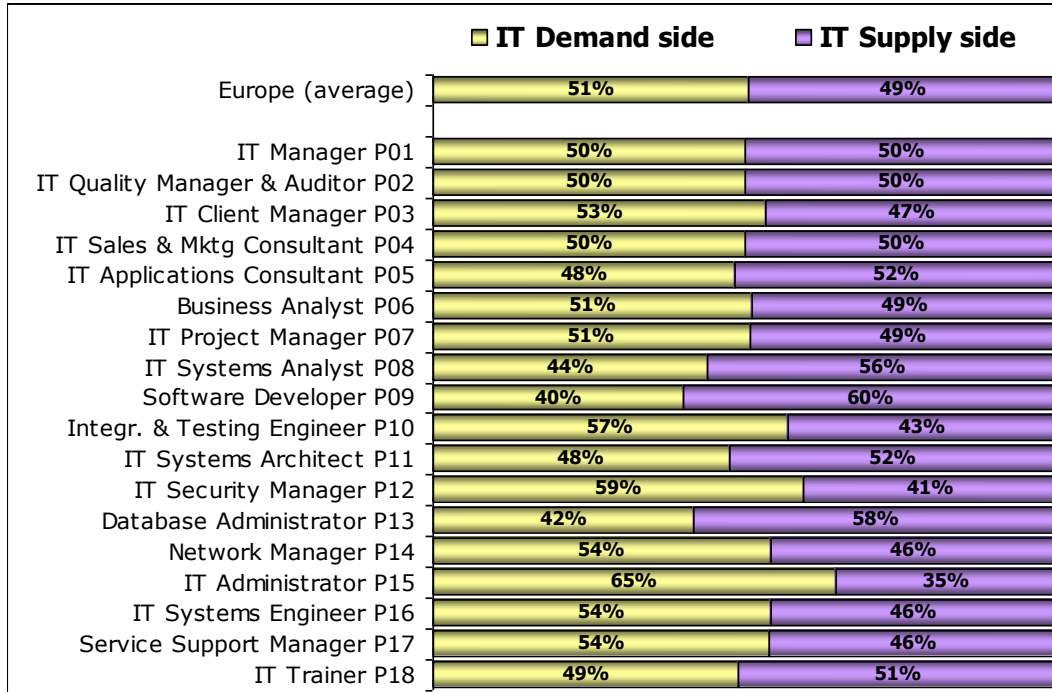


by IT Education	Europe (% by profile)			Europe (% by segment)		
	Total	Main focus	Side/ Not significant	Total	Main focus	Side/ Not significant
P01 IT Manager	8%	6%	11%	100%	48%	52%
P02 IT Quality Manager & Auditor	4%	4%	5%	100%	59%	41%
P03 IT Client Manager	3%	2%	3%	100%	53%	47%
P04 IT Sales & Mktg Consultant	3%	3%	3%	100%	62%	38%
P05 IT Applications Consultant	2%	2%	2%	100%	59%	41%
P06 Business Analyst	2%	2%	3%	100%	53%	47%
P07 IT Project Manager	8%	8%	8%	100%	63%	37%
P08 IT Systems Analyst	7%	8%	5%	100%	73%	27%
P09 Software Developer	12%	13%	10%	100%	68%	32%
P10 Integration & Testing Engineer	7%	8%	4%	100%	77%	23%
P11 IT Systems Architect	4%	5%	3%	100%	75%	25%
P12 IT Security Manager	3%	3%	3%	100%	65%	35%
P13 Database Administrator	3%	4%	3%	100%	65%	35%
P14 Network Manager	3%	3%	5%	100%	50%	50%
P15 IT Administrator	8%	9%	7%	100%	69%	31%
P16 IT Systems Engineer	5%	4%	6%	100%	58%	42%
P17 Service Support Manager	9%	8%	9%	100%	60%	40%
P18 IT Trainer	8%	7%	9%	100%	57%	43%
<b>Total cases</b>	<b>1907</b>	<b>1201</b>	<b>706</b>	<b>100%</b>	<b>63%</b>	<b>37%</b>

(note: the profiles to be analysed are those satisfying the condition of having 10 respondents or more)



### 8.4.6 Profile Distribution by IT Industry



by IT Industry	Europe (% by profile)			Europe (% by segment)		
	Total	Demand side	Supply side	Total	Demand side	Supply side
P01 IT Manager	9%	9%	9%	100%	50%	50%
P02 IT Quality Manager & Auditor	5%	5%	5%	100%	50%	50%
P03 IT Client Manager	3%	3%	3%	100%	53%	47%
P04 IT Sales & Mktg Consultant	3%	3%	3%	100%	50%	50%
P05 IT Applications Consultant	2%	2%	2%	100%	48%	52%
P06 Business Analyst	3%	3%	2%	100%	51%	49%
P07 IT Project Manager	8%	8%	8%	100%	51%	49%
P08 IT Systems Analyst	7%	6%	8%	100%	44%	56%
P09 Software Developer	11%	8%	13%	100%	40%	60%
P10 Integration & Testing Engineer	7%	8%	6%	100%	57%	43%
P11 IT Systems Architect	5%	5%	5%	100%	48%	52%
P12 IT Security Manager	4%	4%	3%	100%	59%	41%
P13 Database Administrator	3%	3%	4%	100%	42%	58%
P14 Network Manager	3%	3%	3%	100%	54%	46%
P15 IT Administrator	7%	9%	5%	100%	65%	35%
P16 IT Systems Engineer	4%	4%	3%	100%	54%	46%
P17 Service Support Manager	10%	10%	9%	100%	54%	46%
P18 IT Trainer	9%	9%	9%	100%	49%	51%
<b>Total cases</b>	<b>1637</b>	<b>829</b>	<b>808</b>	<b>100%</b>	<b>51%</b>	<b>49%</b>

(note: the profiles to be analysed are those satisfying the condition of having 10 respondents or more)



## 8.5 Data Tables

### 8.5.1 Country Comparison

	<b>Total Europe</b>	<b>IT</b>	<b>FI</b>	<b>IE</b>	<b>BE</b>	<b>MT</b>	<b>ES</b>	<b>NO</b>	<b>LV</b>	<b>BA</b>	<b>RO</b>	<b>Oth</b>
	Italy	Finland	Ireland	Belgium	Malta	Spain	Norway	Latvia	Bosnia-Herz.	Romania	Others	
<b>Cases</b>	<b>1918</b>	<b>281</b>	<b>251</b>	<b>192</b>	<b>191</b>	<b>184</b>	<b>177</b>	<b>104</b>	<b>92</b>	<b>88</b>	<b>67</b>	<b>291</b>
<b>Age</b>												
<i>Mean</i>	<b>41.0</b>	<b>38.1</b>	<b>45.0</b>	<b>42.9</b>	<b>43.1</b>	<b>35.3</b>	<b>44.0</b>	<b>43.9</b>	<b>31.8</b>	<b>36.6</b>	<b>35.5</b>	<b>43.8</b>
Less than 30 years	17%	12%	6%	10%	10%	33%	9%	4%	55%	32%	39%	16%
31 .. 40	34%	53%	28%	32%	28%	42%	27%	32%	32%	38%	37%	26%
41 .. 50	30%	31%	36%	35%	39%	20%	38%	41%	8%	24%	15%	25%
More than 50 years	19%	3%	30%	23%	22%	5%	25%	22%	5%	7%	9%	33%
<b>Gender</b>												
Female	16%	8%	24%	19%	12%	16%	11%	15%	15%	19%	28%	19%
Male	84%	92%	76%	81%	88%	84%	89%	85%	85%	81%	72%	81%
<b>Education</b>												
Secondary & other	21%	44%	24%	17%	5%	26%	18%	39%	22%	11%	3%	8%
University (Masters/Bachelors/Phd)	79%	56%	76%	83%	95%	74%	82%	61%	78%	89%	97%	92%
<b>IT Educational</b>												
IT was the main focus of my education	63%	45%	65%	58%	48%	74%	72%	74%	66%	61%	81%	70%
IT was a side subject	25%	34%	21%	24%	37%	17%	21%	10%	26%	35%	18%	23%
IT was not significant in my curriculum	12%	21%	14%	18%	16%	9%	7%	16%	8%	3%	1%	7%
<b>Current professional status</b>												
Full time employee	87%	n.a.	89%	82%	86%	97%	84%	95%	77%	94%	97%	82%
Part time employee	2%	n.a.	2%	2%	2%	2%	1%	2%	5%	2%	0%	4%
Self-employed	7%	n.a.	4%	12%	8%	1%	10%	1%	7%	2%	3%	10%
Student / Unemployed / Retired	4%	n.a.	4%	5%	3%	1%	5%	2%	11%	1%	0%	4%
<b>Number of employees</b>												
1 - 10	11%	n.a.	8%	14%	5%	2%	13%	n.a.	28%	13%	6%	17%
11 - 50	12%	n.a.	7%	12%	4%	8%	15%	n.a.	13%	28%	35%	12%
51 - 250	22%	n.a.	19%	13%	7%	45%	18%	n.a.	19%	28%	34%	25%
251 - 1000	21%	n.a.	24%	19%	12%	35%	19%	n.a.	24%	14%	23%	17%
1000+	34%	n.a.	43%	42%	72%	10%	35%	n.a.	16%	18%	2%	29%
<b>Industry (a)</b>												
My focus is mainly on IT demand side	51%	n.a.	41%	59%	49%	36%	42%	60%	60%	60%	52%	59%
My focus is mainly on IT supply side organizations	49%	n.a.	59%	41%	51%	64%	58%	40%	40%	40%	48%	41%
<b>Knowledge index</b>												
A- Plan	1.66	1.78	1.60	1.73	1.69	1.61	1.63	1.80	1.56	1.62	1.33	1.68
B- Build	1.67	1.71	1.53	1.70	1.50	1.81	1.79	1.60	1.61	1.71	1.72	1.66
C- Run	1.68	1.83	1.55	1.83	1.42	1.73	1.82	1.49	1.73	1.79	1.83	1.58
D- Enable	1.38	1.64	1.25	1.39	1.34	1.19	1.34	1.62	1.17	1.40	1.11	1.42
E- Manage	1.51	1.69	1.40	1.65	1.67	1.32	1.44	1.67	1.23	1.46	1.15	1.52



	<b>Total Europe</b>	<b>IT</b>	<b>FI</b>	<b>IE</b>	<b>BE</b>	<b>MT</b>	<b>ES</b>	<b>NO</b>	<b>LV</b>	<b>BA</b>	<b>RO</b>	<b>Oth</b>
	Italy	Finland	Ireland	Belgium	Malta	Spain	Norway	Latvia	Bosnia-Herz.	Romania	Others	
<b>Knowledge index</b>												
<b>A- Plan</b>	<b>1.66</b>	<b>1.78</b>	<b>1.60</b>	<b>1.73</b>	<b>1.69</b>	<b>1.61</b>	<b>1.63</b>	<b>1.80</b>	<b>1.56</b>	<b>1.62</b>	<b>1.33</b>	<b>1.68</b>
A01) IS & Business Strategy Alignment	1.67	1.84	1.52	1.80	1.62	1.52	1.61	2.04	1.59	1.59	0.91	1.70
A02) Service Level Management	1.59	1.84	1.50	1.68	1.60	1.47	1.59	1.62	1.46	1.51	1.19	1.56
A03) Business Plan Development	1.55	1.60	1.49	1.78	1.68	1.52	1.40	1.67	1.21	1.43	1.06	1.64
A04) Product or Project Planning	1.94	1.95	2.02	2.10	2.12	1.91	1.86	1.87	1.74	1.76	1.67	1.91
A05) Architecture Design	1.72	1.59	1.71	1.77	1.79	1.79	1.75	1.74	1.78	1.73	1.57	1.71
A06) Application Design	1.81	1.88	1.78	1.89	1.73	1.95	1.88	1.91	1.68	1.78	1.46	1.76
A07) Technology Watching	1.83	1.89	1.72	1.92	1.80	1.77	1.84	1.78	1.91	1.88	1.73	1.87
A08) Sustainable development	1.19	1.64	1.06	0.94	0.96	0.92	1.08	1.74	1.13	1.31	1.06	1.26
<b>B- Build</b>	<b>1.67</b>	<b>1.71</b>	<b>1.53</b>	<b>1.70</b>	<b>1.50</b>	<b>1.81</b>	<b>1.79</b>	<b>1.60</b>	<b>1.61</b>	<b>1.71</b>	<b>1.72</b>	<b>1.66</b>
B01a) Design & Development (infrastructure & sw environment)	1.62	1.58	1.58	1.57	1.54	1.74	1.75	1.38	1.73	1.67	1.63	1.67
B01b) Design & Development (data model & application logics)	1.67	1.62	1.64	1.58	1.56	1.82	1.93	1.34	1.65	1.61	1.72	1.72
B01c) Design & Development (user interface)	1.65	1.89	1.49	1.54	1.40	1.80	1.81	1.55	1.63	1.65	1.61	1.68
B02a) Systems Integration (configuration & performance control)	1.70	1.97	1.51	1.69	1.38	1.64	1.83	1.76	1.64	1.84	1.94	1.66
B02b) Systems Integration (package selection & customization)	1.55	1.57	1.35	1.62	1.47	1.60	1.68	1.61	1.49	1.65	1.58	1.59
B03) Testing	1.72	1.86	1.53	1.70	1.59	1.98	1.71	1.94	1.62	1.73	1.81	1.65
B04) Solution Deployment	1.66	1.66	1.46	1.84	1.46	1.88	1.77	1.68	1.52	1.74	1.76	1.64
B05) Documentation Production	1.75	1.56	1.67	2.08	1.63	2.01	1.86	1.54	1.60	1.80	1.75	1.71
<b>C- Run</b>	<b>1.68</b>	<b>1.83</b>	<b>1.55</b>	<b>1.83</b>	<b>1.42</b>	<b>1.73</b>	<b>1.82</b>	<b>1.49</b>	<b>1.73</b>	<b>1.79</b>	<b>1.83</b>	<b>1.58</b>
C01) User Support	2.03	2.06	1.84	2.34	1.70	2.23	2.25	1.83	2.21	2.13	2.09	1.91
C02) Change Support	1.83	1.75	1.79	2.10	1.66	2.06	2.02	1.52	1.85	1.81	1.82	1.73
C03) Service Delivery	1.74	1.86	1.58	2.05	1.57	1.93	1.87	1.48	1.68	1.75	1.94	1.55
C04a) Problem Management (process)	1.87	1.58	1.88	2.22	1.81	2.04	2.17	1.42	2.05	1.91	2.00	1.75
C04b) Problem Management (network operation)	1.37	1.75	1.19	1.34	1.04	1.10	1.40	1.32	1.45	1.76	1.51	1.40
C04c) Problem Management (computer system operation)	1.57	2.05	1.38	1.54	1.18	1.40	1.58	1.54	1.63	1.83	1.76	1.55
C04d) Problem Management (database administration)	1.35	1.68	1.22	1.29	0.97	1.36	1.42	1.32	1.37	1.57	1.55	1.27
C04e) Problem Management (application maintenance)	1.66	1.92	1.55	1.77	1.43	1.73	1.86	1.48	1.59	1.58	1.94	1.47
<b>D- Enable</b>	<b>1.38</b>	<b>1.64</b>	<b>1.25</b>	<b>1.39</b>	<b>1.34</b>	<b>1.19</b>	<b>1.34</b>	<b>1.62</b>	<b>1.17</b>	<b>1.40</b>	<b>1.11</b>	<b>1.42</b>
D01) Information Security Strategy Development	1.44	1.56	1.29	1.46	1.49	1.27	1.46	1.50	1.40	1.53	1.13	1.54
D02) ICT Quality Strategy Development	1.50	1.67	1.38	1.58	1.59	1.36	1.47	1.79	1.30	1.45	1.18	1.49
D03) Education & Training Provision	1.55	1.47	1.47	1.70	1.47	1.39	1.50	1.48	1.42	1.83	1.43	1.81
D04) Purchasing	1.41	1.68	1.30	1.53	1.26	1.12	1.41	1.52	1.25	1.59	1.03	1.50
D05) Sales Proposal Development	1.28	1.65	1.25	1.14	1.19	1.07	1.33	1.56	1.18	1.32	0.94	1.17
D06) Channel Management	0.94	1.54	0.77	0.62	0.70	0.74	0.88	1.67	0.79	0.90	0.64	0.91
D07) Sales Management	0.99	1.43	0.91	0.65	0.83	0.77	0.93	1.56	0.95	1.13	0.79	0.95
D08) Contract Management	1.25	1.43	1.18	1.28	1.20	1.09	1.24	1.56	1.00	1.24	0.88	1.30
D09a) Personnel Development (competence analysis)	1.57	1.77	1.31	1.82	1.65	1.36	1.46	1.81	1.21	1.55	1.40	1.63
D09b) Personnel Development (resource management)	1.66	2.33	1.37	1.74	1.67	1.40	1.47	2.03	1.11	1.45	1.39	1.64
D10) Information & Knowledge Management	1.55	1.49	1.47	1.74	1.63	1.48	1.63	1.38	1.30	1.45	1.34	1.69
<b>E- Manage</b>	<b>1.51</b>	<b>1.69</b>	<b>1.40</b>	<b>1.65</b>	<b>1.67</b>	<b>1.32</b>	<b>1.44</b>	<b>1.67</b>	<b>1.23</b>	<b>1.46</b>	<b>1.15</b>	<b>1.52</b>
E01) Forecast Development	1.26	1.77	1.09	1.06	1.23	1.00	1.09	1.77	1.09	1.14	0.91	1.34
E02) Project & Portfolio Management	1.62	1.93	1.59	1.73	1.88	1.30	1.47	1.73	1.20	1.47	1.22	1.64
E03) Risk Management	1.47	1.59	1.47	1.67	1.69	1.24	1.39	1.52	1.29	1.32	1.19	1.41
E04) Relationship Management	1.61	1.58	1.50	1.94	1.85	1.55	1.64	1.53	1.24	1.59	1.37	1.61
E05) Process Improvement	1.63	1.70	1.61	1.82	1.74	1.43	1.54	1.88	1.33	1.55	1.36	1.63
E06) ICT Quality Management	1.49	1.63	1.36	1.65	1.66	1.41	1.45	1.56	1.18	1.51	1.15	1.50
E07) Business Change Management	1.55	1.70	1.40	1.81	1.63	1.47	1.51	1.85	1.20	1.47	1.12	1.51
E08) Information Security Management	1.41	1.45	1.26	1.48	1.46	1.23	1.44	1.37	1.30	1.61	1.09	1.55
E09) IT Governance	1.55	1.86	1.33	1.70	1.91	1.28	1.45	1.86	1.23	1.51	0.93	1.52



	Total Europe	IT	FI	IE	BE	MT	ES	NO	LV	BA	RO	Oth
		Italy	Finland	Ireland	Belgium	Malta	Spain	Norway	Latvia	Bosnia-Herz.	Romania	Others
<b>Profile (declared)</b>												
P01) IT Manager	24%	24%	17%	25%	35%	15%	26%	61%	11%	15%	10%	21%
P02) IT Quality Manager & Auditor	3%	0%	2%	2%	4%	3%	5%	0%	8%	1%	1%	5%
P03) IT Client Manager	2%	0%	2%	1%	2%	1%	3%	2%	1%	3%	2%	2%
P04) IT Sales & Mktg Consultant	2%	0%	6%	2%	1%	1%	3%	1%	1%	1%	1%	3%
P05) IT Applications Consultant	5%	10%	8%	6%	5%	6%	5%	3%	3%	0%	1%	3%
P06) Business Analyst	6%	1%	5%	6%	10%	9%	3%	8%	4%	10%	1%	8%
P07) IT Project Manager	13%	18%	14%	16%	11%	15%	15%	5%	8%	10%	12%	10%
P08) IT Systems Analyst	4%	1%	4%	7%	2%	4%	6%	2%	9%	2%	1%	3%
P09) Software Developer	13%	20%	10%	5%	6%	32%	10%	3%	21%	13%	21%	7%
P10) Integr. & Testing Engineer	1%	0%	1%	1%	1%	1%	2%	1%	0%	2%	10%	1%
P11) IT Systems Architect	5%	4%	10%	4%	6%	4%	2%	5%	5%	1%	1%	5%
P12) IT Security Manager	3%	2%	2%	2%	7%	2%	1%	3%	5%	1%	0%	3%
P13) Database Administrator	1%	2%	1%	1%	0%	1%	1%	2%	3%	0%	0%	2%
P14) Network Manager	2%	7%	1%	4%	1%	0%	0%	0%	0%	6%	0%	1%
P15) IT Administrator	5%	4%	6%	4%	3%	2%	8%	4%	13%	14%	4%	5%
P16) IT Systems Engineer	4%	5%	4%	4%	3%	3%	3%	0%	4%	7%	18%	4%
P17) Service Support Manager	3%	3%	3%	4%	3%	2%	5%	1%	1%	0%	6%	2%
P18) IT Trainer	5%	0%	3%	8%	3%	0%	5%	1%	2%	13%	6%	16%
<b>Proximity Profile (computed)</b>												
P01) IT Manager	8%	2%	13%	7%	15%	7%	7%	10%	8%	5%	0%	10%
P02) IT Quality Manager & Auditor	4%	1%	4%	4%	10%	5%	3%	3%	4%	6%	1%	3%
P03) IT Client Manager	3%	1%	2%	2%	2%	3%	5%	8%	5%	2%	4%	2%
P04) IT Sales & Mktg Consultant	3%	4%	4%	2%	3%	3%	2%	5%	1%	2%	0%	2%
P05) IT Applications Consultant	2%	3%	1%	6%	1%	3%	1%	0%	0%	1%	1%	3%
P06) Business Analyst	2%	1%	3%	2%	2%	0%	3%	9%	1%	3%	0%	2%
P07) IT Project Manager	8%	10%	6%	9%	16%	5%	3%	8%	0%	7%	3%	10%
P08) IT Systems Analyst	7%	5%	6%	6%	5%	10%	8%	6%	14%	6%	3%	7%
P09) Software Developer	12%	20%	13%	10%	9%	15%	16%	13%	8%	6%	7%	7%
P10) Integr. & Testing Engineer	7%	3%	3%	4%	6%	13%	6%	6%	7%	10%	19%	7%
P11) IT Systems Architect	4%	1%	7%	2%	4%	4%	3%	2%	9%	5%	6%	7%
P12) IT Security Manager	3%	0%	4%	1%	7%	2%	5%	1%	4%	5%	4%	3%
P13) Database Administrator	4%	5%	6%	3%	3%	3%	3%	2%	4%	3%	3%	3%
P14) Network Manager	3%	6%	3%	2%	1%	2%	3%	5%	2%	10%	0%	4%
P15) IT Administrator	9%	20%	3%	8%	4%	3%	8%	13%	9%	6%	16%	8%
P16) IT Systems Engineer	5%	13%	4%	3%	0%	2%	6%	2%	7%	6%	7%	4%
P17) Service Support Manager	8%	2%	9%	18%	8%	14%	11%	1%	5%	5%	12%	8%
P18) IT Trainer	8%	3%	8%	12%	5%	9%	6%	9%	12%	14%	10%	10%

## 8.5.2 IT Profiles Comparison

Europe	Total	Proximity Profiles																	
		P01 IT Mgr	P02 Quality Mgr	P03 Client Mgr	P04 Sales & Mktg	P05 IT Applic	P06 Bus. Analyst	P07 Project Mgr	P08 Sys. Analyst	P09 Sys. Develop	P10 Int&Test Eng	P11 Sys. Architect	P12 Security Mgr	P13 DB Admin	P14 Network Mgr	P15 IT Admin	P16 IT Sys Eng	P17 Serv. Supp Mgr	P18 IT Trainer
<b>Cases</b>	1918	154	80	51	52	41	45	153	127	231	126	85	60	68	64	165	96	163	157
<b>Age</b>																			
Mean	41.0	46.7	43.1	41.6	39.7	43.2	44.5	43.5	41.7	39.2	38.2	39.0	41.7	40.5	40.1	38.3	38.6	40.3	41.1
Less than 30 years	17%	6%	20%	16%	13%	10%	9%	9%	15%	19%	29%	29%	12%	20%	13%	22%	20%	17%	17%
From 31 to 40 years	34%	25%	21%	25%	38%	32%	22%	28%	27%	41%	33%	31%	32%	54%	45%	41%	40%	34%	30%
From 41 to 50 years	30%	26%	33%	43%	40%	37%	42%	41%	27%	29%	26%	21%	42%	25%	28%	26%	24%	26%	24%
More than 50 years	19%	43%	26%	16%	8%	22%	27%	22%	21%	12%	12%	19%	15%	14%	10%	13%	20%	19%	19%
<b>Gender</b>																			
Female	16%	19%	30%	12%	8%	10%	11%	17%	15%	16%	20%	13%	10%	6%	6%	7%	5%	17%	41%
Male	84%	81%	70%	88%	92%	90%	89%	83%	85%	84%	80%	87%	90%	94%	94%	93%	95%	83%	59%
<b>Education</b>																			
Secondary & other	21%	7%	16%	43%	19%	24%	9%	13%	20%	22%	20%	20%	10%	23%	31%	36%	37%	19%	15%
University (Masters/Bachelors/Phd)	79%	93%	84%	57%	81%	76%	91%	87%	80%	78%	80%	80%	90%	77%	69%	64%	63%	81%	85%
<b>IT Educational</b>																			
IT was the main focus of my education	63%	48%	59%	53%	62%	59%	53%	63%	73%	68%	77%	75%	65%	65%	50%	69%	58%	60%	57%
IT was a side subject	25%	34%	29%	33%	21%	27%	27%	25%	19%	24%	19%	16%	27%	21%	30%	21%	29%	22%	30%
IT was not significant in my curriculum	12%	18%	13%	14%	17%	15%	20%	12%	8%	8%	4%	8%	8%	14%	20%	10%	13%	18%	13%
<b>Current professional status (a)</b>																			
Full time employee	87%	86%	92%	77%	88%	88%	93%	83%	85%	89%	91%	90%	90%	89%	88%	85%	93%	85%	87%
Part time employee	2%	1%	1%	9%	0%	0%	0%	2%	4%	2%	2%	6%	5%	0%	0%	3%	0%	3%	1%
Self-employed	7%	11%	4%	11%	10%	9%	5%	12%	7%	6%	5%	1%	5%	2%	8%	5%	2%	8%	7%
Student / Unemployed / Retired	4%	1%	3%	4%	2%	3%	2%	3%	4%	3%	2%	0%	9%	4%	7%	5%	4%	5%	4%
<b>Number of employees (a,b)</b>																			
1 - 10	11%	10%	13%	35%	14%	21%	16%	15%	7%	9%	10%	7%	4%	10%	12%	9%	7%	11%	11%
11 - 50	12%	10%	6%	18%	14%	6%	0%	10%	11%	14%	19%	15%	17%	15%	10%	21%	7%	13%	11%
51 - 250	22%	20%	25%	26%	31%	24%	16%	14%	16%	23%	29%	18%	9%	20%	30%	25%	18%	30%	21%
251 - 1000	21%	17%	10%	6%	20%	21%	13%	20%	19%	23%	18%	19%	33%	26%	23%	28%	32%	19%	25%
1000+	34%	43%	46%	15%	20%	27%	56%	41%	36%	36%	39%	34%	35%	30%	23%	26%	20%	37%	29%
<b>Industry (a)</b>																			
My focus is mainly on IT demand side	51%	59%	50%	53%	50%	48%	51%	51%	44%	40%	57%	48%	59%	42%	54%	65%	54%	54%	49%
My focus is mainly on IT supply side organizations	49%	40%	50%	47%	50%	52%	49%	49%	56%	60%	43%	52%	41%	58%	46%	35%	46%	46%	51%
<b>Proximity Index</b>	83.6	76.3	82.6	88.7	86.3	92.1	91.7	89.9	88.5	82.0	86.7	76.8	89.3	80.7	85.0	89.0	83.1	81.9	72.9
Min	40	40	43	50	50	43	45	43	41	40	42	42	42	41	40	41	41	42	40
Max	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
<b>Knowledge Index</b>																			
Area Run (A)	1.66	1.96	1.64	1.83	1.86	1.91	2.23	2.03	1.85	1.44	1.31	1.82	1.80	1.62	1.65	1.62	1.56	1.45	1.36
Area Build (B)	1.67	1.01	1.46	1.60	1.69	2.22	1.76	1.74	2.08	1.93	2.25	1.59	1.62	1.62	1.69	1.61	1.69	1.47	1.30
Area Run (C)	1.68	1.10	1.57	1.64	1.52	1.80	1.63	1.47	1.73	1.69	1.69	1.25	1.98	1.96	1.91	2.31	2.17	1.91	1.20
Area Enable (D)	1.38	1.70	1.60	1.83	1.72	1.43	1.84	1.60	1.34	1.08	0.95	1.06	1.66	1.39	1.42	1.45	1.34	1.13	1.35
Area Manage (E)	1.51	1.98	1.98	1.96	1.67	1.80	2.16	1.95	1.42	1.15	0.98	1.18	1.89	1.48	1.43	1.41	1.41	1.27	1.46

a) data not available from Italy  
b) data not available from Norway



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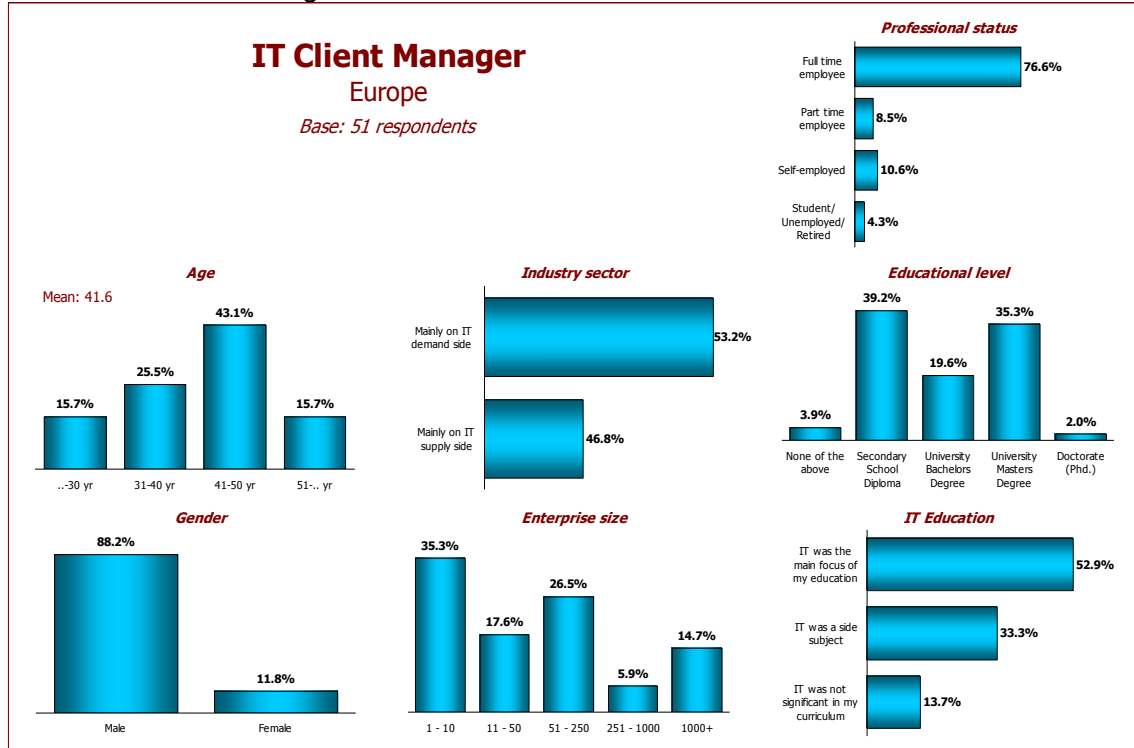
Europe	Total	Proximity Profiles																	
		P01 IT Mgr	P02 Quality Mgr	P03 Client Mgr	P04 Sales & Mktg	P05 IT Applic	P06 Bus. Analyst	P07 Project Mgr	P08 Sys Analyst	P09 Sw Develop	P10 Int&Test Eng	P11 Sys Architect	P12 Security Mgr	P13 DB Admin	P14 Network Mgr	P15 IT Admin	P16 IT Sys Eng	P17 Serv Supp Mgr	P18 IT Trainer
<b>Knowledge index</b>																			
<b>A - Plan</b>	<b>1.66</b>	<b>1.96</b>	<b>1.64</b>	<b>1.83</b>	<b>1.86</b>	<b>1.91</b>	<b>2.23</b>	<b>2.03</b>	<b>1.85</b>	<b>1.44</b>	<b>1.31</b>	<b>1.82</b>	<b>1.80</b>	<b>1.62</b>	<b>1.65</b>	<b>1.62</b>	<b>1.56</b>	<b>1.45</b>	<b>1.36</b>
A01) IS & Business Strategy Alignment	1.67	2.64	1.73	2.08	1.77	1.98	2.82	2.09	1.74	1.27	1.02	1.68	1.73	1.53	1.55	1.50	1.54	1.35	1.44
A02) Service Level Management	1.59	1.98	1.84	1.88	1.75	1.68	2.07	1.95	1.43	1.20	0.98	1.44	1.73	1.66	1.56	1.66	1.75	1.71	1.44
A03) Business Plan Development	1.55	2.22	1.81	1.78	1.92	1.56	2.42	2.08	1.56	1.21	1.01	1.47	1.70	1.31	1.45	1.39	1.13	1.39	1.44
A04) Product or Project Planning	1.94	2.25	2.08	1.94	2.02	2.17	2.04	2.05	2.03	1.83	1.57	1.87	2.03	2.10	1.69	1.68	1.58	1.77	1.83
A05) Architecture Design	1.72	1.74	1.46	1.78	1.90	2.02	2.51	1.93	2.06	1.57	1.58	2.39	2.12	1.69	1.64	1.68	1.67	1.47	1.17
A06) Application Design	1.81	1.51	1.45	1.59	1.40	2.32	2.29	2.24	2.72	2.08	1.82	2.28	1.85	1.85	1.70	1.45	1.52	1.44	1.39
A07) Technology Watching	1.83	2.03	1.59	1.88	2.50	2.27	2.07	1.90	2.02	1.52	1.63	2.21	2.05	1.79	2.03	2.11	1.97	1.58	1.35
A08) Sustainable development	1.19	1.34	1.14	1.69	1.62	1.27	1.62	1.36	1.21	0.83	0.88	1.24	1.20	1.04	1.53	1.53	1.33	1.34	0.96
<b>B - Build</b>	<b>1.67</b>	<b>1.01</b>	<b>1.46</b>	<b>1.60</b>	<b>1.69</b>	<b>2.22</b>	<b>1.76</b>	<b>1.74</b>	<b>2.08</b>	<b>1.93</b>	<b>2.25</b>	<b>1.59</b>	<b>1.62</b>	<b>1.62</b>	<b>1.69</b>	<b>1.61</b>	<b>1.69</b>	<b>1.47</b>	<b>1.30</b>
B01a) Design & Development (infrastructure & sw environment)	1.62	1.03	1.26	1.35	1.87	1.80	1.53	1.52	1.95	1.92	2.01	2.06	1.75	1.65	1.89	1.67	1.86	1.45	1.04
B01b) Design & Development (data model & application logic)	1.67	0.98	1.24	1.43	1.42	2.02	1.60	1.69	2.33	2.39	2.18	1.93	1.78	1.85	1.52	1.39	1.44	1.33	1.17
B01c) Design & Development (user interface)	1.65	0.94	1.33	1.53	1.48	1.90	1.56	1.65	2.23	2.47	2.17	1.86	1.55	1.59	1.61	1.55	1.59	1.24	1.18
B02a) Systems Integration (configuration & performance control)	1.70	0.94	1.25	1.49	1.69	2.17	1.71	1.71	2.07	1.90	2.57	1.81	1.67	1.84	1.92	1.79	2.21	1.40	0.99
B02b) Systems Integration (package selection & customization)	1.55	0.87	1.26	2.10	2.25	2.88	2.42	2.13	2.13	1.40	2.16	1.22	1.40	1.24	1.52	1.52	1.68	1.11	0.91
B03) Testing	1.72	1.08	2.18	1.57	1.63	2.17	1.71	1.86	2.17	1.98	2.52	1.20	1.45	1.72	1.50	1.55	1.57	1.52	1.57
B04) Solution Deployment	1.66	1.10	1.45	1.65	1.37	2.68	1.62	1.57	1.80	1.65	2.26	1.52	1.63	1.60	2.13	1.90	1.54	1.98	1.18
B05) Documentation Production	1.75	1.17	1.73	1.71	1.81	2.12	1.89	1.82	1.95	1.73	2.08	1.40	1.73	1.50	1.47	1.51	1.61	1.83	2.34
<b>C - Run</b>	<b>1.68</b>	<b>1.10</b>	<b>1.57</b>	<b>1.64</b>	<b>1.52</b>	<b>1.60</b>	<b>1.47</b>	<b>1.73</b>	<b>1.69</b>	<b>1.69</b>	<b>1.25</b>	<b>1.98</b>	<b>1.96</b>	<b>1.91</b>	<b>2.17</b>	<b>2.17</b>	<b>2.17</b>	<b>1.91</b>	<b>1.20</b>
C01) User Support	1.53	1.34	1.86	1.88	1.73	2.17	1.82	1.81	2.10	2.03	2.14	1.84	1.52	1.84	2.07	2.07	2.57	2.55	1.81
C02) Change Support	1.83	1.26	1.96	1.92	1.83	1.93	2.00	1.71	2.06	1.70	1.79	1.31	2.03	1.79	1.66	2.14	2.38	2.51	1.32
C03) Service Delivery	1.74	1.26	1.70	2.02	1.69	2.05	1.72	1.52	1.72	1.65	1.75	1.18	1.92	2.04	1.61	2.32	2.07	2.24	1.31
C04a) Problem Management (process)	1.87	1.40	1.89	1.76	1.71	1.95	1.93	1.92	1.87	1.80	1.87	1.51	2.25	2.04	1.95	2.15	2.08	2.39	1.46
C04b) Problem Management (network operation)	1.37	0.93	1.20	1.43	1.17	1.37	1.24	1.04	1.25	0.96	1.21	0.94	1.25	2.72	2.04	2.72	2.04	1.26	0.83
C04c) Problem Management (computer system operation)	1.57	0.97	1.26	1.55	1.48	1.63	1.31	1.18	1.47	1.38	1.55	1.19	2.02	2.07	2.09	2.81	2.73	1.49	0.89
C04d) Problem Management (database administration)	1.35	0.71	1.00	1.23	1.15	1.44	1.44	1.14	1.57	1.48	1.47	1.24	1.65	1.47	1.64	1.56	1.23	0.85	0.85
C04e) Problem Management (application maintenance)	1.66	0.92	1.50	1.43	1.40	1.65	1.51	1.46	1.76	2.53	1.78	1.16	1.63	1.87	1.98	1.91	1.61	1.11	1.11
<b>D - Enable</b>	<b>1.38</b>	<b>1.70</b>	<b>1.60</b>	<b>1.83</b>	<b>1.72</b>	<b>1.43</b>	<b>1.84</b>	<b>1.60</b>	<b>1.34</b>	<b>1.08</b>	<b>0.95</b>	<b>1.06</b>	<b>1.66</b>	<b>1.39</b>	<b>1.42</b>	<b>1.45</b>	<b>1.34</b>	<b>1.13</b>	<b>1.35</b>
D01) Information Security Strategy Development	1.44	1.64	1.96	1.67	1.62	1.66	1.73	1.48	1.37	1.06	1.12	1.33	2.55	1.41	1.52	1.61	1.17	1.16	1.16
D02) ICT Quality Strategy Development	1.50	1.85	2.13	1.96	1.71	1.66	2.02	1.72	1.58	1.13	1.13	1.28	1.73	1.29	1.48	1.53	1.47	1.28	1.26
D03) Education & Training Provision	1.55	1.70	1.70	1.75	1.79	1.59	1.89	1.64	1.68	1.26	1.25	1.20	1.85	1.34	1.53	1.55	1.52	1.35	1.97
D04) Purchasing	1.41	1.77	1.49	1.67	1.90	1.46	1.91	1.71	1.21	1.09	0.93	1.04	1.87	1.34	1.58	1.63	1.20	1.35	1.25
D05) Sales Proposal Development	1.28	1.63	1.30	1.76	1.98	1.37	1.76	1.49	1.27	1.04	0.86	1.04	1.53	1.32	1.27	1.35	1.14	0.94	1.22
D06) Channel Management	0.94	1.32	1.05	1.92	1.44	0.71	1.20	1.05	0.79	0.68	0.52	0.78	1.07	0.96	1.23	1.17	0.90	0.59	0.82
D07) Sales Management	0.99	1.40	1.14	1.84	1.75	0.78	1.51	1.20	0.83	0.71	0.54	0.73	0.97	1.27	1.13	1.12	0.62	0.96	1.22
D08) Contract Management	1.25	1.84	1.51	1.92	1.65	1.32	1.60	1.56	1.07	0.83	0.67	0.91	1.70	1.21	1.31	1.33	1.10	1.10	1.14
D09a) Personnel Development (competence analysis)	1.57	1.89	1.76	1.67	1.77	1.83	2.11	1.98	1.64	1.29	1.11	1.08	1.65	1.59	1.48	1.50	1.54	1.31	1.73
D09b) Personnel Development (resource management)	1.54	1.94	1.66	1.73	2.02	1.81	1.59	2.20	2.10	1.43	1.31	1.07	1.60	1.85	1.64	1.78	1.65	1.42	1.62
D10) Information & Knowledge Management	1.55	1.76	1.81	1.98	1.50	1.63	2.27	1.68	1.65	1.32	1.13	1.21	1.70	2.01	1.41	1.43	1.33	1.42	1.66
<b>E - Manage</b>	<b>1.51</b>	<b>1.98</b>	<b>1.98</b>	<b>1.96</b>	<b>1.67</b>	<b>1.80</b>	<b>2.16</b>	<b>1.95</b>	<b>1.42</b>	<b>1.15</b>	<b>0.98</b>	<b>1.18</b>	<b>1.89</b>	<b>1.48</b>	<b>1.43</b>	<b>1.41</b>	<b>1.41</b>	<b>1.27</b>	<b>1.46</b>
E01) Forecast Development	1.26	1.79	1.44	1.98	1.77	1.29	1.71	1.56	1.07	0.97	0.82	1.04	1.40	1.31	1.42	1.30	1.10	0.95	1.12
E02) Project & Portfolio Management	1.62	2.14	1.96	1.80	1.79	1.66	2.09	2.61	1.62	1.35	1.09	1.20	1.77	1.66	1.44	1.39	1.48	1.29	1.46
E03) Risk Management	1.47	1.95	2.19	1.92	1.80	2.11	2.02	2.10	1.70	1.43	1.31	1.07	1.60	1.85	1.64	1.78	1.65	1.42	1.62
E04) Relationship Management	1.61	2.09	1.85	2.22	1.81	1.88	2.07	2.07	1.45	1.31	1.11	1.26	1.85	1.53	1.41	1.46	1.40	1.56	1.68
E05) Process Improvement	1.63	2.10	2.13	2.18	2.15	2.05	2.51	2.01	1.69	1.29	1.13	1.21	1.65	1.53	1.55	1.44	1.46	1.40	1.68
E06) ICT Quality Management	1.49	1.75	2.14	1.88	1.60	1.83	2.24	1.84	1.40	1.14	1.02	1.09	1.62	1.43	1.44	1.44	1.41	1.30	1.62
E07) Business Change Management	1.55	1.66	1.94	2.08	1.90	2.73	1.97	1.59	2.19	1.50	1.27	1.48	1.59	1.37	1.59	1.59	1.57	1.10	1.42
E08) Information Security Management	1.41	1.62	2.05	1.67	1.54	1.59	1.60	1.42	1.39	1.02	0.95	1.19	2.67	1.56	1.54	1.53	1.57	1.10	1.14
E09) IT Governance	1.55	2.27	2.13	1.90	1.83	1.83	2.36	2.05	1.50	1.00	0.90	1.22	2.15	1.53	1.38	1.44	1.59	1.20	1.46

Europe	Total	Proximity Profiles																	
		P01 IT Mgr	P02 Quality Mgr	P03 Client Mgr	P04 Sales & Mktg	P05 IT Applic	P06 Bus. Analyst	P07 Project Mgr	P08 Sys Analyst	P09 Sw Develop	P10 Int&Test Eng	P11 Sys Architect	P12 Security Mgr	P13 DB Admin	P14 Network Mgr	P15 IT Admin	P16 IT Sys Eng	P17 Serv Supp Mgr	P18 IT Trainer
<b>IT Profile (declared)</b>																			
R01) IT Manager	24%	47%	26%	43%	38%	29%	40%	32%	20%	10%	10%	19%	22%	23%	25%	25%	17%	13%	
R02) IT Quality Manager & Auditor	3%	7%	18%	2%	2%	2%	0%	3%	0%	1%	2%	0%	3%	0%	0%	0%	1%	7%	
R03) IT Client Manager	2%	3%	0%	0%	4%	0%	2%	4%	1%	0%	0%	0%	2%	1%	2%	2%	0%	1%	
R04) IT Sales & Mktg Consultant	2%	6%	1%	6%	10%	0%	4%	3%	1%	0%	0%	6%	2%	0%	0%	0%	1%	4%	
R05) IT Applications Consultant	5%	3%	9%	6%	8%	12%	9%	7%	10%	7%	4%	4%	2%	1%	9%	3%	3%	1%	
R06) Business Analyst																			

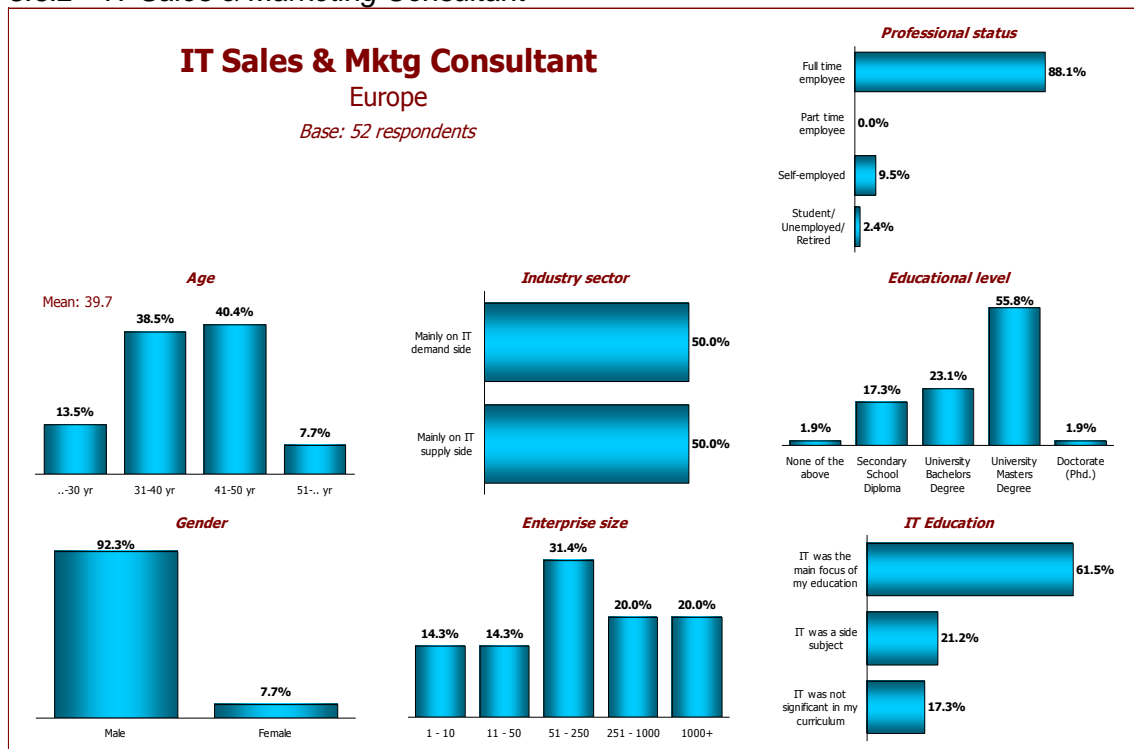


## 8.6 Proximity Profiles – Detail of Non Analysed Profiles

### 8.6.1 IT Client Manager

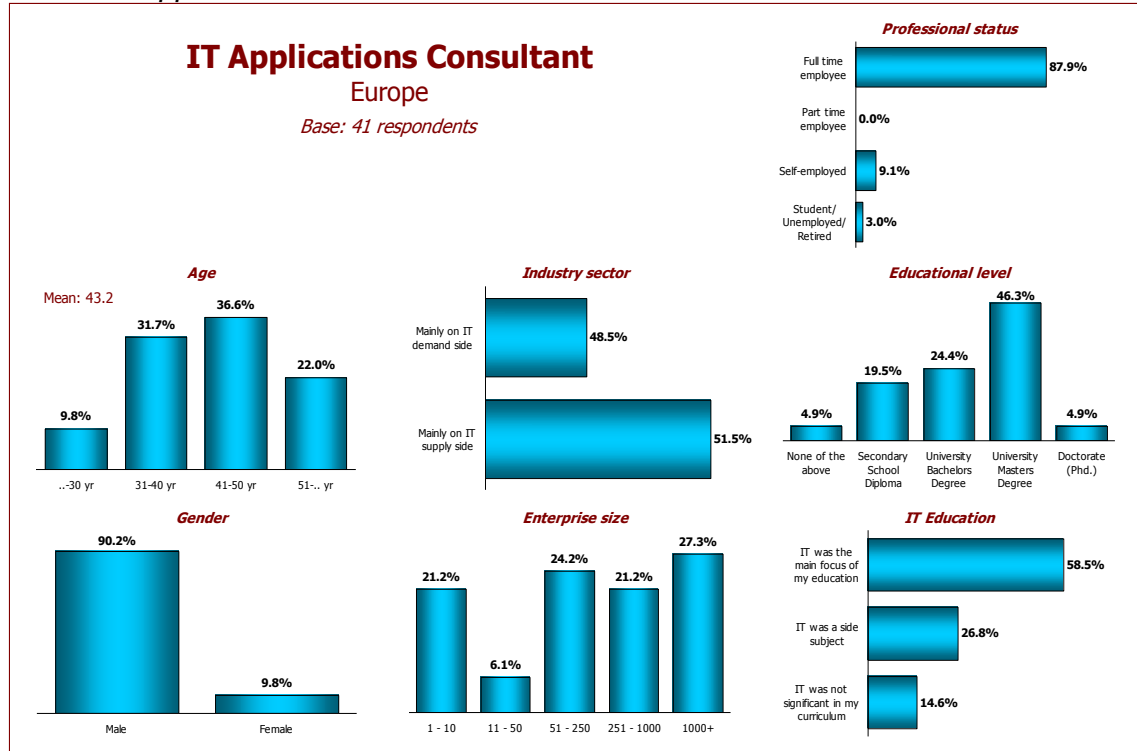


### 8.6.2 IT Sales & Marketing Consultant

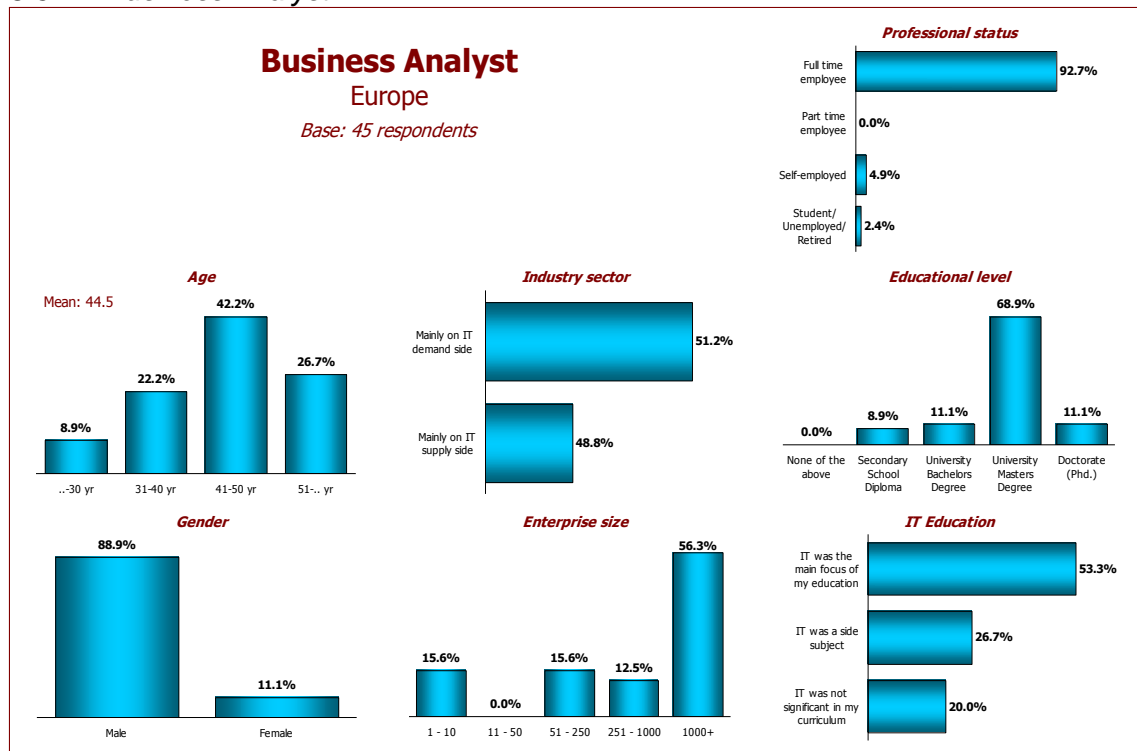




### 8.6.3 IT Applications Consultant

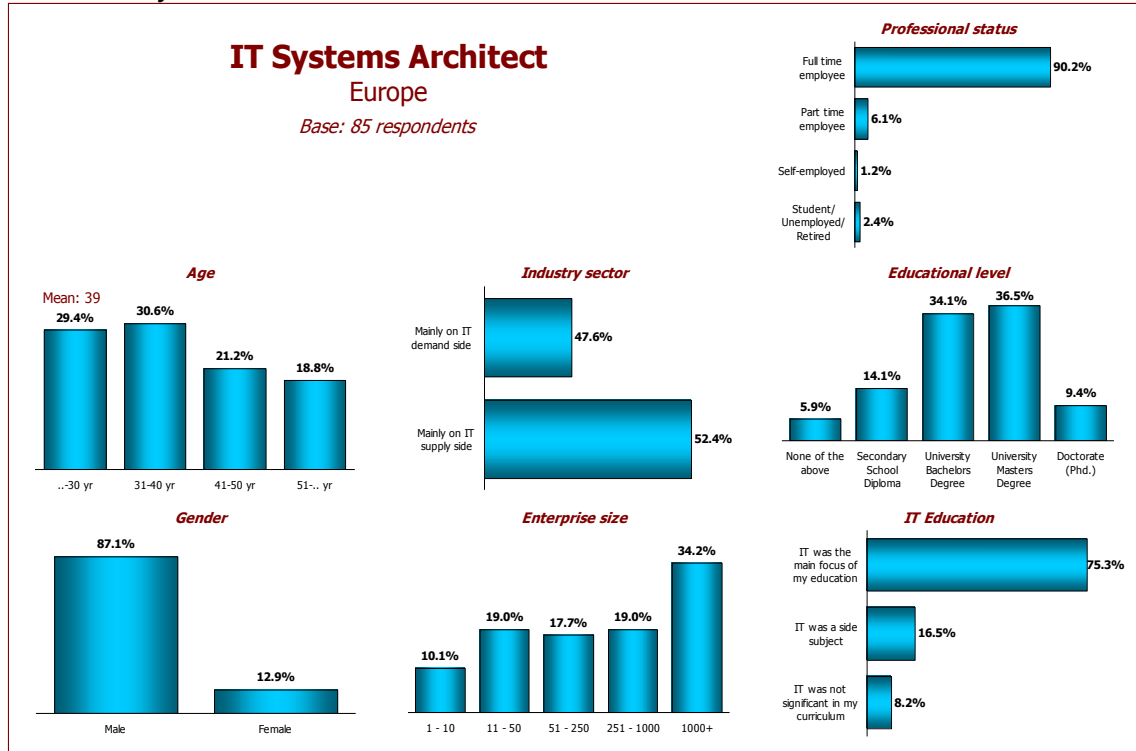


### 8.6.4 Business Analyst

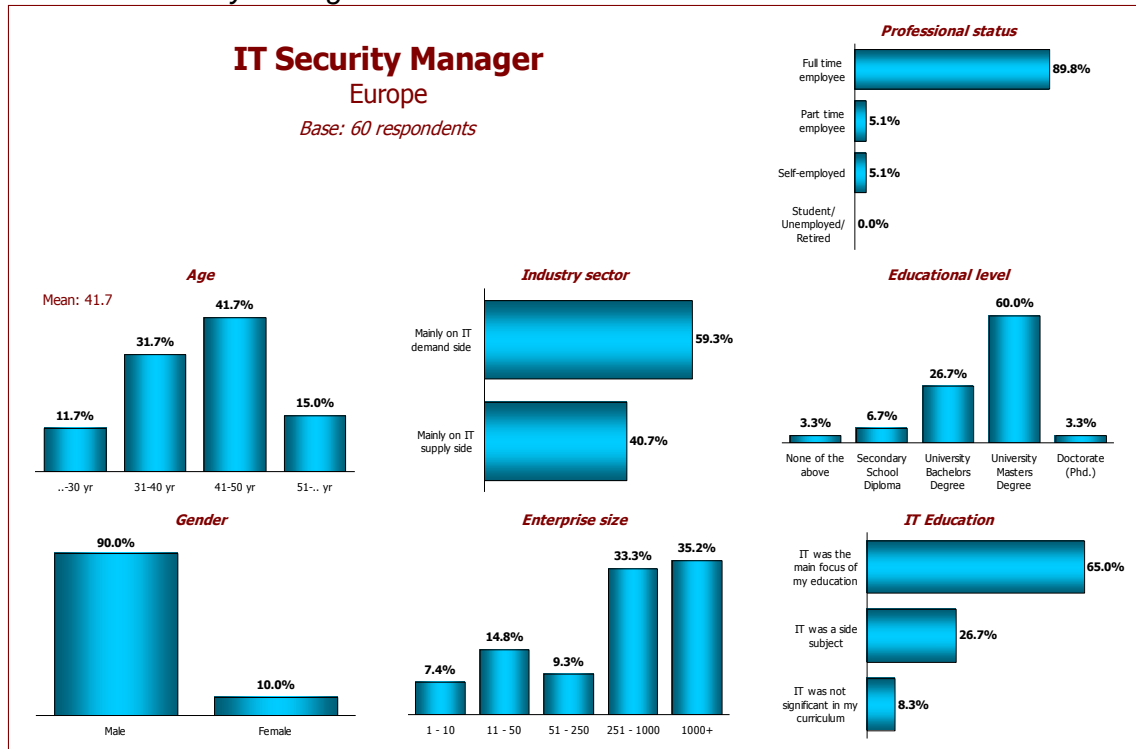




### 8.6.5 IT Systems Architect

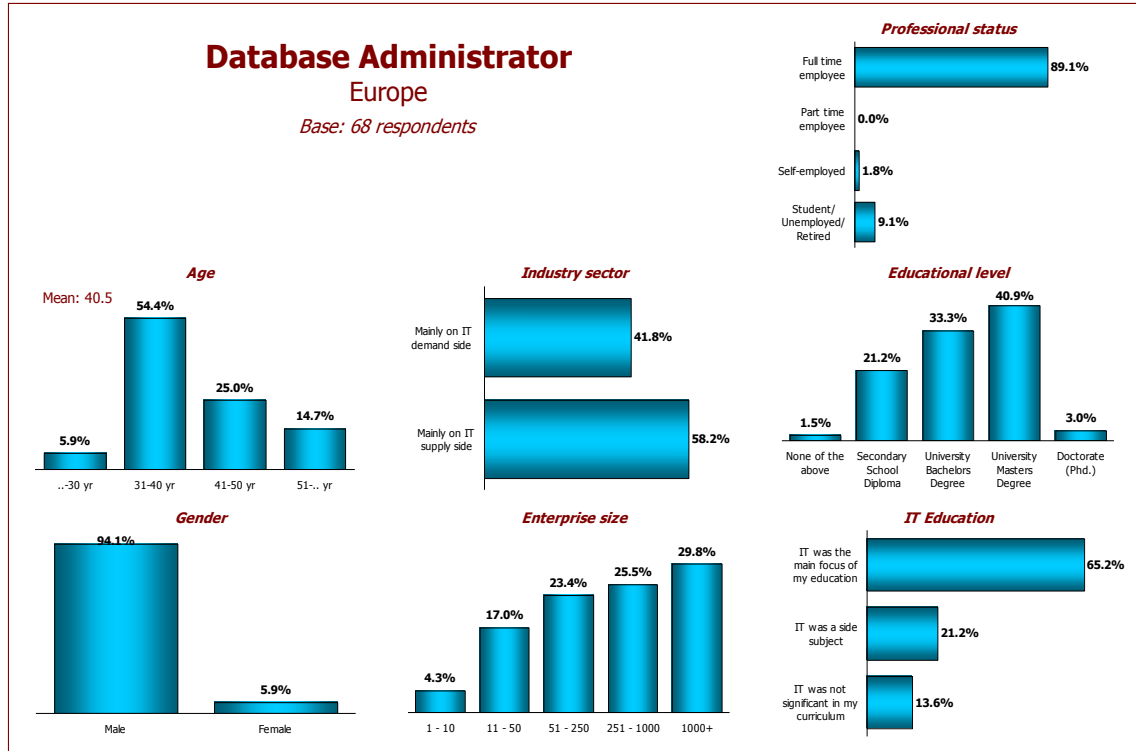


### 8.6.6 IT Security Manager





### 8.6.7 Database Administrator



### 8.6.8 Network Manager

