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## WP4 - Certification

# **DELIVERABLE 4.3 - Present national and European-level uptake of e-CF powered tool** **Country report: NORWAY**

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## Table of Content

<b>1</b>	<b>INTRODUCTION TO THE DELIVERABLE AND SCOPE .....</b>	<b>6</b>
<b>2</b>	<b>CONTEXT .....</b>	<b>7</b>
<b>3</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>8</b>
<b>4</b>	<b>METHODOLOGY .....</b>	<b>9</b>
4.1	PERSONAL INFORMATION .....	9
4.2	COMPETENCE QUESTIONNAIRE .....	9
4.3	COMPETENCE QUESTIONNAIRE .....	10
4.4	PROXIMITY PROFILES .....	11
4.5	COMPETENCE PROFICIENCY INDEX .....	11
4.6	CRITERIA FOR INCLUSION AND COUNTRY LEVEL ANALYSIS .....	11
4.7	THE EUROPEAN BENCHMARK.....	12
<b>5</b>	<b>RESPONDENT DEMOGRAPHICS .....</b>	<b>13</b>
5.1	RESPONDENTS BY AGE .....	13
5.2	RESPONDENTS BY GENDER.....	14
5.3	RESPONDENTS BY EDUCATION LEVEL.....	14
5.4	RESPONDENTS BY EDUCATIONAL FIELD.....	15
5.5	RESPONDENTS BY INDUSTRY SECTOR .....	16
5.6	RESPONDENTS BY ENTERPRISE SIZE .....	16
5.7	RESPONDENTS BY PROFESSIONAL STATUS .....	17
5.8	RESPONDENTS BY DECLARED ICT PROFILE .....	18
<b>6</b>	<b>PROXIMITY PROFILES AND COMPETENCES .....</b>	<b>20</b>
6.1	RESPONDENTS BY PROXIMITY PROFILE .....	20
6.2	COMPARISON BETWEEN PROFESSIONAL PROFILE AND PROXIMITY PROFILE .....	20
6.3	ANALYSIS OF COMPETENCE PROFICIENCY INDEX.....	23
<b>7</b>	<b>PROFILES ANALYSIS .....</b>	<b>25</b>
7.1	BUSINESS ANALYST .....	25
7.2	DEVELOPER .....	26
7.3	DIGITAL MEDIA SPECIALIST.....	27
7.4	ICT TRAINER.....	29
7.5	SYSTEMS ADMINISTRATOR.....	30
7.6	TECHNICAL SPECIALIST.....	31
7.7	PROJECT MANAGER.....	32
<b>8</b>	<b>CONCLUSIONS.....</b>	<b>34</b>
<b>9</b>	<b>ANNEX.....</b>	<b>38</b>
9.1	PROXIMITY PROFILES – OVERVIEW .....	38
9.1.1	<i>Profile Distribution by Age .....</i>	<i>38</i>
9.1.2	<i>Profile Distribution by Gender.....</i>	<i>38</i>
9.1.3	<i>Profile Distribution by Education Level.....</i>	<i>39</i>
9.1.4	<i>Profile Distribution by IT Education.....</i>	<i>39</i>
9.1.5	<i>Profile Distribution by Industry .....</i>	<i>40</i>
9.1.6	<i>Profile Distribution by Enterprise Size .....</i>	<i>40</i>
9.1.7	<i>Profile Summary Table.....</i>	<i>41</i>
9.2	PROXIMITY PROFILES – DETAILS.....	42
9.2.1	<i>Business Analyst.....</i>	<i>42</i>
9.2.2	<i>Developer .....</i>	<i>42</i>
9.2.3	<i>Digital Media Specialist.....</i>	<i>43</i>
9.2.4	<i>ICT Trainer .....</i>	<i>43</i>
9.2.5	<i>Systems Administrator.....</i>	<i>44</i>
9.2.6	<i>Technical Specialist .....</i>	<i>44</i>
9.2.7	<i>Project Manager .....</i>	<i>45</i>

## LIST OF FIGURES

Figure 1 ICT Professional Profiles .....	9
Figure 2 Example of Competence Level and Experience Level .....	10
Figure 3 Personal Results: the 'Radar' .....	10
Figure 4 Personal Results: Proximity Index .....	10
Figure 5 Respondents Distribution by Age .....	13
Figure 6 Respondents Distribution by Gender .....	14
Figure 7 Respondents Distribution by Education Level .....	15
Figure 8 Respondents Distribution by Educational Field .....	16
Figure 9 Respondents Distribution by Industry Sector .....	16
Figure 10 Respondents Distribution by Enterprise Size .....	17
Figure 11 Respondents Distribution by Professional Status .....	18
Figure 12 Respondents Distribution by ICT Profile .....	19
Figure 13 Respondents Distribution by Proximity Profile .....	20
Figure 14 Technical Specialist: Declared and Calculated Profile .....	21
Figure 15 ICT Trainer: Declared and Calculated Profile .....	21
Figure 16 Digital Media Specialist: Declared and Calculated Profile .....	21
Figure 17 Business Analyst: Declared and Calculated Profile .....	21
Figure 18 Test Specialist: Declared and Calculated Profile .....	22
Figure 19 Comparison of Declared Profile and Proximity Profile .....	22
Figure 20 Comparison of Declared Profile and Proximity Profile .....	23
Figure 21 Competence Proficiency Index by Competence Areas .....	23
Figure 22 Competence Proficiency Index .....	24
Figure 23 Competence Proficiency Index – Business Analyst .....	25
Figure 24 Competence Proficiency Index – Developer .....	26
Figure 25 Competence Proficiency Index – Digital Media Specialist .....	27
Figure 26 Competence Proficiency Index – ICT Trainer .....	29
Figure 27 Competence Proficiency Index – Systems Administrator .....	30
Figure 28 Competence Proficiency Index – Technical Specialist .....	31
Figure 29 Competence Proficiency Index – Project Manager .....	32
Figure 30 The Norwegian Respondents Profile .....	34
Figure 31 Profile Distribution by Age Range .....	35
Figure 32 CPI Difference versus whole Norway .....	36
Figure 33 Competence Proficiency Index – Differences to European Average .....	37
Figure 34 Proximity profiles - profile distribution by age .....	38
Figure 35 Proximity profiles - profile distribution by gender .....	38
Figure 36 Proximity profiles - profile distribution by education level .....	39
Figure 37 Proximity profiles - profile distribution by IT education .....	39
Figure 38 Proximity profiles - profile distribution by industry .....	40
Figure 39 Proximity profiles - profile distribution by enterprise size .....	40
Figure 40 Proximity profile - Business analyst .....	42
Figure 41 Proximity profile - Developer .....	42
Figure 42 Proximity profile - Digital media specialist .....	43
Figure 43 Proximity profile - ICT trainer .....	43
Figure 44 Proximity profile - System administrator .....	44

Figure 45 Proximity profile - Technical specialist.....	44
Figure 46 Proximity profile - Project manager .....	45

# 1 Introduction to the Deliverable and Scope

The outputs described in this deliverable outline the uptake of the European e-Competence Framework (e-CF) powered tool at national and European level. This deliverable is part of Work Package (WP) 4 – Certification. The main objective of WP4 – Certification is to strengthen the ICT professionalism, by promoting the e-CF in Europe.

This deliverable relates to task4.3 which aims to:

- Accelerate the adoption of the e-CF through the CEPIS e-Competence Benchmark Tool,
- Allow ICT professionals/aspiring professionalism to identify the competences they need/lack for various ICT roles (using the e-CF) enabling them to adapt to market demand and communicate competences across borders,
- Work with partners to generate an update of the e-CF at national and EU level,
- Raise awareness of the e-CF,
- Promote and share the resulting data on usage to demonstrate the value of the e-CF.

This deliverable will be widely disseminated once approved among national and European stakeholders to show the real-world, practical application of the e-CF in action. It shows how ICT practitioners can identify the competences they need/lack for various ICT roles, enabling them to adapt to market labour demand and communicate their competences in a comparable manner across the EU.

## 2 Context

The increasing demand for ICT practitioners is hampered not only by the lack of new entrants into the profession, but also by the mismatches in the competences that practitioners have today. While ICT provides crisis-resistant employment, Europe currently is not producing the talent with the right skills to boost competitiveness. The ICT professional bodies and informatics societies that are the members of CEPIS recognise the need to reduce the gap between supply and demand and commit to taking action to redress the balance and promote ICT professionalism.

Under the Grand Coalition for Digital Jobs, the European Commission has launched a series of practical initiatives to help fill the growing number of vacant ICT-related jobs across Europe, and to ensure that more people get the training needed to work in the digital economy. To support the roll-out of the Grand Coalition for Digital Jobs, DIGITALEUROPE has collaborated with partners such as ECDL Foundation, CEPIS and others to establish the Secretariat of the Grand Coalition. This deliverable is part of the WP4 within the strategy of the Secretariat of the Grand Coalition.

The purpose of this deliverable is to present the national and European-level uptake of an e-CF powered tool, which is a free, online interactive tool for current and future ICT professionals to identify the competences they need for various ICT roles, enabling them to adapt to labour market demand. It will enable individuals and recruiters to map their competences against a range of profiles and better equip themselves for future roles and employment. It will allow companies to benchmark entire departments, identify workforce gaps and plan accordingly.

It is powered by the European e-Competence Framework the common language for ICT competences created by the CEN workshop on ICT skills and therefore provides a standard upon which Europeans can better understand what is needed for their current and future IT roles based on the ICT Professional Profiles developed by CEN.

Several national reports have been produced for each participating country which aggregate the information for that country and produce a snapshot of the ICT professional landscape. This report will provide information to support policy making, as well as update information for the training industry on market needs.

The European level report brings together all of the data from throughout Europe and provide a basis for policy recommendations on future actions to support the ongoing development of the ICT profession.

### 3 Executive Summary

This report provides the Norwegian results of a European initiative designed to identify the digital competences held by ICT professionals across 31 countries in Europe and beyond. This report is based on the CEPIS e-Competence Benchmark an online, interactive tool that enables individuals and organisations to assess their competences against the European e-Competence Framework (e-CF)<sup>1</sup>. Using the results of the CEPIS e-Competence Benchmark, this report offers a unique view of the status of professional e-competence in Europe and shows the practical application and real-world usage of the e-CF.

As experts predict that the demand for skilled ICT professionals will far outstrip supply, it is more important than ever to provide current and future professionals with the ability to compare their competences against those needed for typical ICT job profiles throughout Europe. This helps identify training and professional development opportunities to transition to new roles and even to start an ICT career. This work was carried out as part of the Grand Coalition for Digital Jobs, an EU-wide initiative to address the competence mismatches and fill vacancies of ICT practitioners to boost employment.

The results gathered through this pan-European initiative provide an insight into the level of professional competences and a snapshot of the types of ICT profession in each country. It also is a means to implement the e-CF, demonstrating to individuals and organisations how it can be of immediate and practical benefit. The ability to determine which competencies are underdeveloped on a national and European scale can assist policy makers as well as training providers with timely information for decision making. This, in turn, can facilitate the development of focused training courses to further educate the workforce so as to meet the needs of the labour market.

The research has been conducted via an interactive, free, web-based tool that is powered solely by the European e-Competence Framework ([e-CF](#)) and the accompanying professional profiles. The e-CF has been developed by the CEN (European Committee for Standardization) Workshop on ICT Skills and is supported by the European Commission. This framework identifies 36 ICT competences which are all used in this tool along with the professional job profiles developed by CEN.

This project has been led by the Council of European Professional Informatics Societies (CEPIS) and implemented in conjunction with CEPIS members. Special thanks to [Den Norske Dataforening \(DND\)](#) who led the project in Norway and provided expert perspectives on the national ICT landscape.

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<sup>1</sup> For more information about the European e-Competence Framework see: <http://www.ecompetences.eu/>



## 4 Methodology

This initiative has been conducted in 31 countries in Europe and beyond using an interactive, web-based tool: the [CEPIS e-Competence Benchmark](#). The European results are compiled based on over 2,000 responses provided by participants from these countries.

It is important to note that the results presented here reflect the constituency of those who participated in the CEPIS e-Competence Benchmark. In some countries that may have implications for the general statistical significance of the data. The CEPIS e-Competence Benchmark has been completed by individual respondents who consider themselves to be ICT practitioners, or who will soon become one, and is divided into three sections as described below. It is fully compatible with and is based on the e-CF and associated professional profiles.

### 4.1 Personal Information

In the online tool, each respondent is invited to register and then enter personal information including education background, employment status, organisation size, and industry. They then select the ICT profile that matches their current role from the following 23 professional profiles, grouped into 6 families:<sup>2</sup>

BUSINESS MANAGEMENT	Chief Information Officer Business Information Manager ICT Operations Manager	DESIGN	Business Analyst Systems Analyst Enterprise Architect Systems Architect
SUPPORT	Account Manager ICT Trainer ICT Security Specialist ICT Consultant	DEVELOPMENT	Developer Digital Media Specialist Test Specialist
SERVICE & OPERATIONS	Database Administrator Systems Administrator Network Specialist Technical Specialist Service Desk Agent <sup>3</sup>	TECHNICAL MANAGEMENT	Quality Assurance Manager ICT Security Manager Project Manager Service Manager

Figure 1 ICT Professional Profiles

### 4.2 Competence Questionnaire

In this section of the assessment, the respondent completes the competence questionnaire, which consists of 36 competences. The questionnaire is divided in five areas of competences - Plan, Build, Run, Enable, Manage - that are derived from ICT business processes.

For each competence, the level options available are: None, Knowledge, Experience, or Knowledge and Experience. Upon selecting 'Experience' the respondent is asked to indicate their corresponding level of experience. Additional information, such as

<sup>2</sup> For more information on the professional profiles : <http://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA%2016458.pdf>

<sup>3</sup> The profile of *Service Desk Agent* is excluded from the present analysis as the profile was sufficiently broad to encompass most respondents, thus skewing the results.

examples of the knowledge and skills associated with that competence, is also available to assist the respondent in choosing an appropriate level.

B-Build	None	Knowledge	Experience	Knowledge & Experience
<b>B.1. Design and Development</b> Designs and engineers software and/or hardware components to meet required specifications, including energy efficiency issues. Follows a systematic methodology to analyse and build the required components and interfaces. Performs unit and system testing to ensure requirements are met.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Please select all currently relevant experience levels (select one or more as required)				
<b>Level 2</b> Systematically develops small components.	<b>Level 3</b> Acts creatively to develop and integrate components into a larger product.	<b>Level 4</b> Handles complexity by developing standard procedures and architectures in support of cohesive product development.	<b>Level 5</b> Has ultimate responsibility for strategic direction of product, technical architecture or technology development.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
OK				
<b>B.2. Systems Integration</b> Installs additional hardware, software or sub system components into an existing or proposed system. Complies with established processes and procedures (e.g. configuration management), taking into account the specification, capacity and compatibility of existing and new modules to ensure integrity and interoperability. Verifies system performance and	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2 Example of Competence Level and Experience Level

### 4.3 Competence Questionnaire

Upon completion of the questionnaire, the respondent is presented with personal results. These results are displayed on a graphical radar, split into 36 segments (one for each competence) as illustrated in [Figure 3](#). The graphic will show which of the 23 ICT professional profiles best matches the respondent's e-competences, regardless of the profile the respondent selected.

The results are represented in a proximity index which gives an indication of how the respondent's competences match the requirements of the specific job profile (see [Figure 4](#)). A high proximity index indicates that the respondent has the necessary competences for this role.

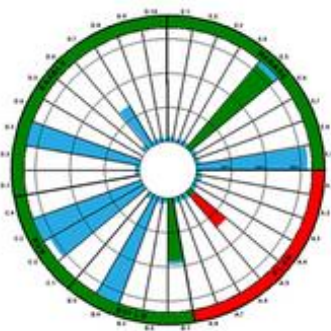


Figure 3 Personal Results: the 'Radar'

View report	Your proximity to this profile	View e-CF profile
 SYSTEMS ANALYST	84.75 %	
 ICT TRAINER	76.47 %	
 TECHNICAL SPECIALIST	59.09 %	
 DIGITAL MEDIA SPECIALIST	51.43 %	

Figure 4 Personal Results: Proximity Index

Moreover, the results also indicate the competences that the individual should seek to improve, as well as the competences that exceed the level required for the given profile.

Each respondent can review their proximity to any other professional profile to assess their potential to move into a new role, and export the results into a report that may be printed.

#### 4.4 Proximity Profiles

The Proximity Profile is used to identify and classify respondents into homogeneous groups in terms of specific skills (professional profile).

The CEPIS e-Competence Benchmark uses the 23 professional profiles as defined by the CEN Workshop on ICT skills. Each profile is characterised by a specific set of competences (ranging from two to five competences) selected from the 36 competences identified and described in the e-CF.

An algorithm produces a score, based on the knowledge and experience reported, for each of the 23 profiles. These scores are then compared with what is required for each profile and expressed as a percentage match. The highest score shows the profile(s) that is closest to the expertise of the respondent. This is referred to as the Proximity Profile. The level of proximity is shown as a percentage: a 100% proximity index means that the competence declared by the respondent completely satisfies the requirements for that profile.

#### 4.5 Competence Proficiency Index

The Competence Proficiency Index (CPI) is used to measure the degree to which the competencies identified by the e-CF framework are represented in Europe today.

On the basis of the respondents' declaration of competence, a Competence Proficiency Index is computed for each of the 36 competence identified in the e-CF. This index, expressed as a percentage, represents the degree of proficiency for each competence with respect to the e-CF. So, a 100% Competence Proficiency Index means that the respondent declared to have relevant experience at each one of proposed levels of competence.

The analysis of the Competence Proficiency Index of each competence can be useful to design detailed training paths to cover the competence gaps.

#### 4.6 Criteria for Inclusion and Country Level Analysis

In order to ensure the integrity of the results, certain criteria for inclusion of the results were established at the level of the individual response as well as at the country level.

The criteria for individual responses were established so as to exclude responses that are incomplete, or completed in a manner that is implausible. Implausible

responses include those that for example have the highest level of knowledge and experience in all competences. Responses that do not comply with the established criteria have been excluded from the results.

The data validation ensures that only results meeting the following criteria are included:

- knowledge of 5 or more competences,
- experience in no more than 31 competences,
- Proximity Profile score(s) of at least 40%,
- ex-aequo<sup>4</sup> top score in 5 profiles or less.

With the high number of participating countries, it was necessary to decide upon the baseline criteria to ensure that the volume and the quality of responses were suitable for country level analysis. The following criteria were adopted to ensure the integrity of the country reports:

- a competence profile is included when 10 or more valid questionnaires are completed. In other words a cluster of 10 respondents enables a professional profile to be analysed for that country,
- a country profile can be generated where there are more than 50 valid assessments completed, and at least one competence profile has 10 or more valid assessments.

## 4.7 The European Benchmark

All country results are compared to the European benchmark, sometimes also referred to as European average. In order to avoid distortions due to a higher number of contributions from certain countries, the European benchmark has been computed as a weighted mean, taking into account an equal number of contributions from those countries which, although in varying degrees, have proved to be the major contributors.

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<sup>4</sup> Assessments which show the same proximity score for more than one profile are counted as many times as the same score appears.

## 5 Respondent Demographics

The research was launched across 31 countries in Europe and beyond. Over 2,000 current and future ICT practitioners participated in the research.

This chapter provides an overview of the demographics of Norwegian respondents. Thanks to Den Norske Dataforening (DND), 184 respondents were assessed using the CEPIS e-Competence Benchmark, which resulted in 7 professional profiles qualifying for analysis.

### 5.1 Respondents by Age

Norwegian respondents represented a range of age groups, as highlighted in [Figure 5<sup>5</sup>](#). The average age of respondents in Norway is around 45 years; that is three years older than the European average. As shown in [Figure 5](#), less than 5% respondents are under 30 years old. The majority of respondents are aged between 40-50 years old (34.8%) and many of them are older than 50 (32.6%). This reflects the membership of the national professional body (DND) which is largely more senior professionals and the high rate of degrees in the Norwegian work force. Another possible explanation is that Norwegian organisations adopted computing quite early (EDP- electronic data processing - became mainstream in Norwegian businesses between 1975 and 1985 in a European context) this explains why a larger proportion of ICT professionals is 50 years or older.

Looking more closely at the average respondent age per job profile, it appears that the Systems Administrator is the youngest profile (39 years old), while the ICT Trainer profile is the oldest one (50 years old). However, in Norway both are older than their European counterparts.

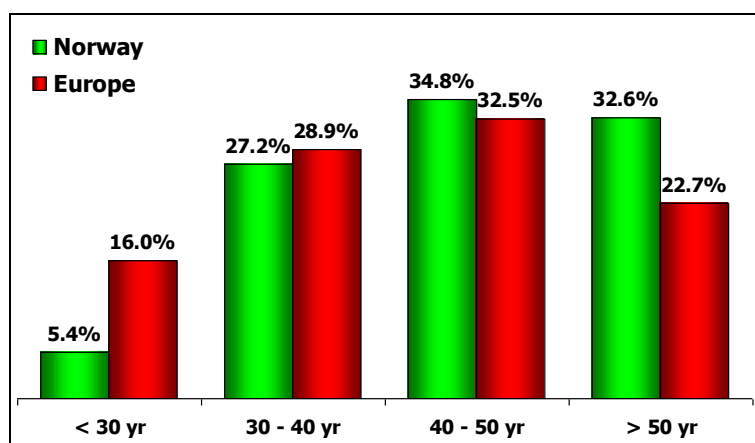


Figure 5 Respondents Distribution by Age

<sup>5</sup> Note: as '<20 yr' and '>60 yr' classes count for a low % of total assessments (respectively <1% and about 5%), they have been grouped into the adjacent class. As a result only four age classes are shown: '<30 yr', '31-40 yr', '41-50 yr', and '>50 yr'.

## 5.2 Respondents by Gender

The gender results show that there is still a degree of gender imbalance in ICT. However, the comparative analysis in [Figure 6](#) shows that the percentage of female ICT professionals in Norway is significantly higher than in the rest of Europe in the sample. Women in Norway represent 21% of ICT professionals, while the European average is only 15%. Among all countries taking part in the research and eligible for analysis, Norway shows the highest rate of female presence in the sample. This reflects the fact that Norway is a global frontier when it comes to female participation in the work force and higher education.

A high representation of female ICT professionals is found among Developers (40%), ICT Trainers (33%), and Project Managers (32%). The role of Business Analyst scored the lowest rate of female representation with only 5% women, that is about a quarter of the Norwegian overall average (21%).

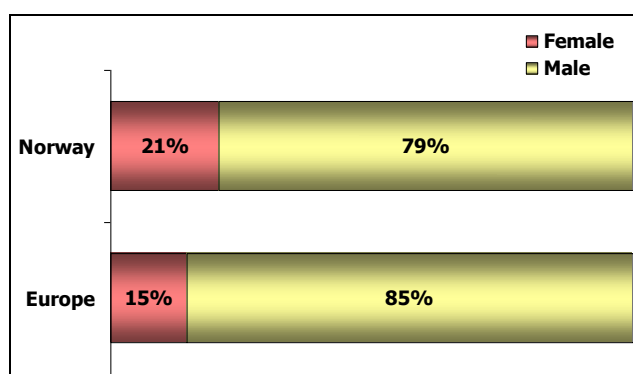


Figure 6 Respondents Distribution by Gender

## 5.3 Respondents by Education Level

The respondents were asked to select the highest level of education that they had achieved. The majority of the respondents of Norway (90%) have at least a degree level qualification, showing the importance of third level qualifications in gaining employment in this sector. Moreover, the Norwegian rate of 90% is slightly higher than other European countries in this sample, which average at 86%. 46% of Norwegian ICT professionals obtained a fourth level qualification (master's degree or PhD), which scores 6% more than the average rate in Europe (40%).

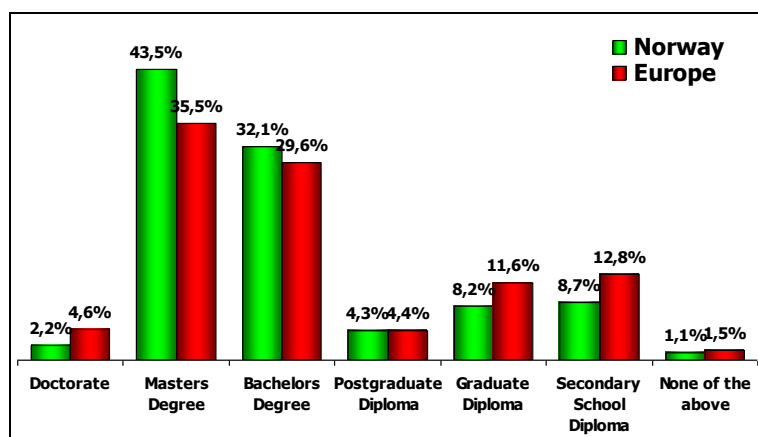


Figure 7 Respondents Distribution by Education Level

However there are disparities according to the job profile. Only 74% Technical Specialists and 86% Project Managers are graduated. Conversely, all the respondents that declared to be Developers, Digital Media Specialists, and ICT Trainers have graduated.

There is a high rate of master's/PhD graduates among Business Analysts and Developers (70% each). This rate drops to 25% for Systems Administrator and to 26% for Technical Specialist; this is considerably lower than the national average of 46%.

## 5.4 Respondents by Educational Field

The variety of educational backgrounds of ICT practitioners indicates that the ICT profession is both attractive and accessible to graduates from different faculties. In Norway, almost two thirds of respondents have an IT-focused background. This means that a minority of Norwegian (41%) and European (33%) professionals have an education in which IT was only a side subject or not significant in their studies.

In almost all Norwegian profiles a prevalence of IT-focused education appears in the sample, in particular for Digital Media Specialists (89%) and Developers (80%). Lower rates of IT-focused education were found among ICT Trainers (44%) and Project Managers (43%). The Systems Administrator profile shows a wide gap between the IT-focused education rate of Norwegian ICT practitioners (50%) and the European average (72%). In Norway, many ICT professionals started their careers before it developed educational programs in IS/IT. Consequently, most experienced ICT professionals with a long-time career in the field have courses in e.g. programming as part of their degree. Their ICT competence is acquired through learning from experience, courses and part-time education.

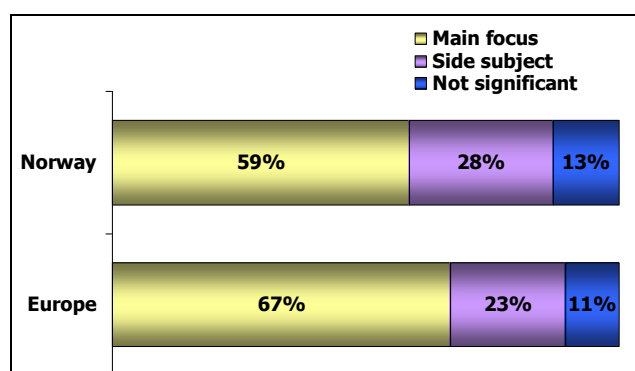


Figure 8 Respondents Distribution by Educational Field

## 5.5 Respondents by Industry Sector

Close to half of respondents from Norway come from the IT demand side, as is the case in the whole of Europe: the average is 46% for respondents focused on IT demand side activities, while the European average is 49%. Some profiles are focused mainly on the IT demand side: ICT Trainer (61%), Systems Administrator (58%), and Business Analyst (55%). Norwegian data shows that there are three profiles which are more or less strongly focused on the IT supply side, namely Digital Media Specialist (53%), Developer (60%), and Technical Specialist (63%). A perfect balance with 50%-50% is found for the Project Manager profile.

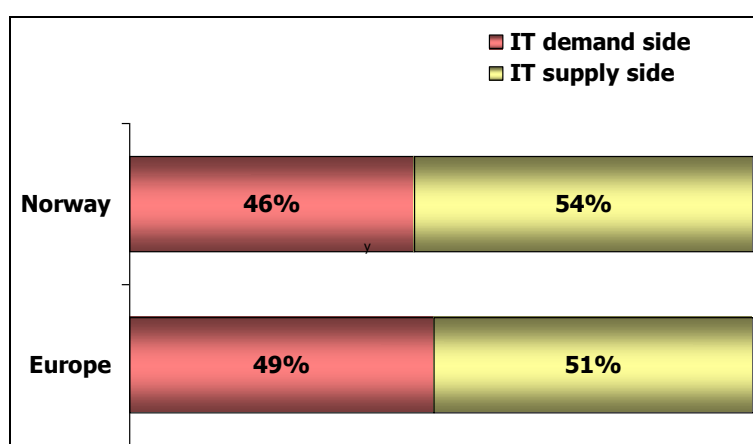


Figure 9 Respondents Distribution by Industry Sector

## 5.6 Respondents by Enterprise Size

The distribution of respondents by organization size shows a preference towards bigger enterprises. The rate of respondents in micro or small enterprises is 20% in the sample, while 34% work in larger companies. The European average shows a similar situation: 24% of respondents work in micro/small enterprises and 36% work in large organisations with more than 1,000 employees.



A number of profiles are more prevalent in large organisations (+1,000 employees), these include: Developer (50%), Digital Media Specialist (42%), Project Manager (41%), and ICT Trainer (41%). On the other hand, ICT Trainers (18%) and Project Managers (15%) are more concentrated in micro organisations (1-10 employees).

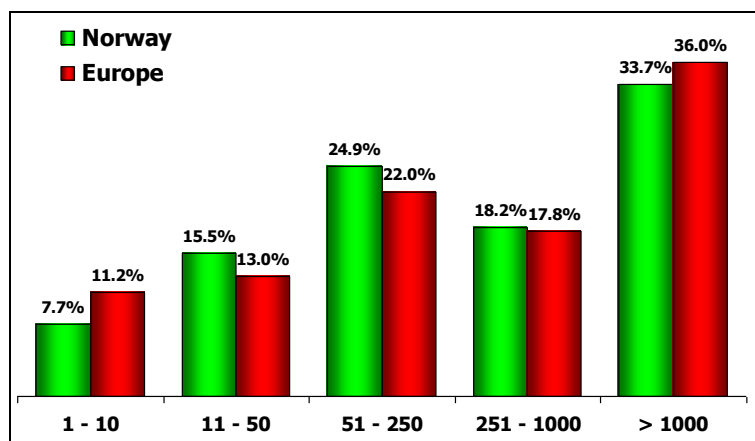


Figure 10 Respondents Distribution by Enterprise Size

## 5.7 Respondents by Professional Status

95% of Norwegian respondents hold full-time positions. This is the highest rate among the surveyed countries, and it is significantly higher than the European average of 78%. National experts note that the Norwegian work force is protected by the Working Environment Act, which, among other things, regulates the use of temporary labour. As a consequence, Norway has a higher proportion of full-time employees in the work force than most other countries.

Another factor in this high employment rate is that the Norwegian economy is one of the strongest in Europe and that Norway has one of the lowest unemployment rates in general. In some areas, Norwegian organisations compete for qualified personnel, once again confirming the shortage of qualified professionals.

There is very little variance between the job profiles with regards to professional status. Four of them show a 100% rate of full-time employees (Systems Administrator, Digital Media Specialist, Developer, ICT Trainer), and the remaining three profiles (Project Manager, Technical Specialist and Business Analyst) show rates ranging from 93% to 95%.

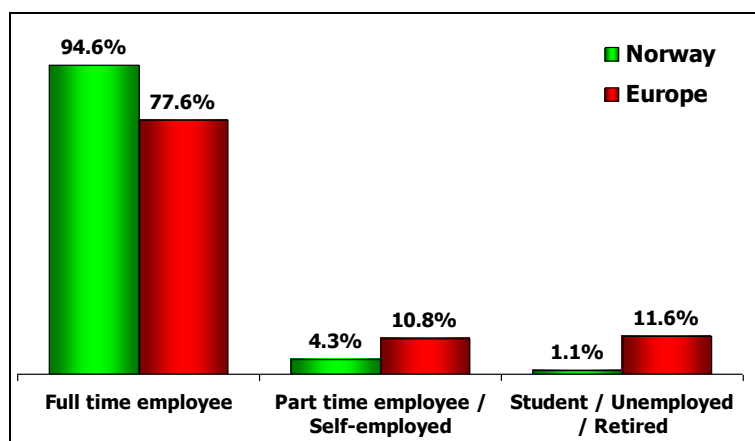


Figure 11 Respondents Distribution by Professional Status

## 5.8 Respondents by Declared ICT Profile

[Figure 12](#) shows the distribution of ICT profiles chosen by the respondents during registration (before starting the assessment). This subjective point of view is based on their experience and the actual role they hold. It differs from the Proximity Profile as explained in chapter 1.4.

Almost all 23 ICT profiles were selected to a certain extent, but nine profiles were chosen by 4% or less: Database Administrator, Service Desk Agent, Service Manager, ICT Security Manager, Digital Media Specialist, ICT Security Specialist, Quality Assurance Manager, Systems Analyst, and Business Information Manager. Two profiles were not selected at all: ICT Trainer and Network Specialist.

Overall, the results show that the profiles selected by the Norwegian respondents are in line with the European average. Only three of the Norwegian self-declared profiles had a noticeable variance (that is  $\pm 4\%$ ): the ICT Consultant profile was chosen by 4.9% of Norwegians, while across Europe the rate was 10.9%; the Developer profile was chosen by 11.2% of European ICT professionals, but only by 7.1% of Norwegians; and the Test Specialist profile was chosen by 7.6% of Norwegians, whereas across Europe the rate was 2.7%.

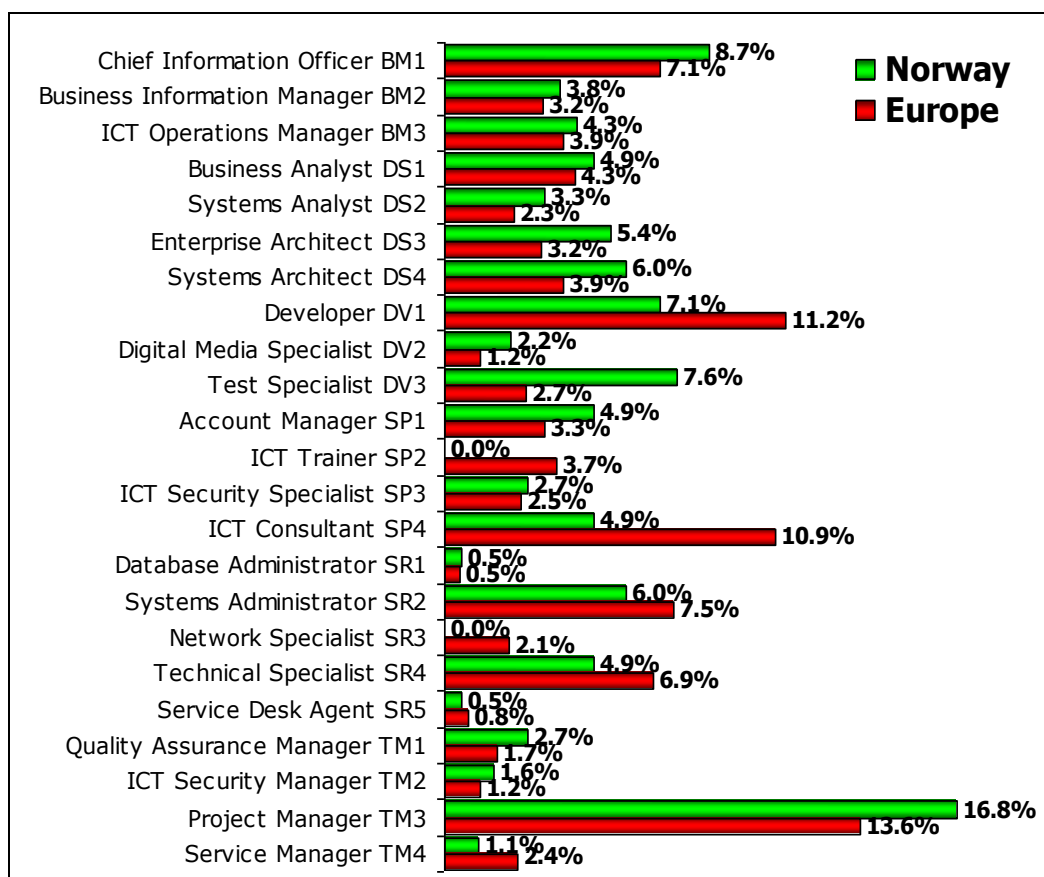


Figure 12 Respondents Distribution by ICT Profile

## 6 Proximity Profiles and Competences

### 6.1 Respondents by Proximity Profile

Based on the outcome of the calculated Proximity Profiles we can see a picture of ICT profiles emerge from the competences declared by the Norwegian respondents.

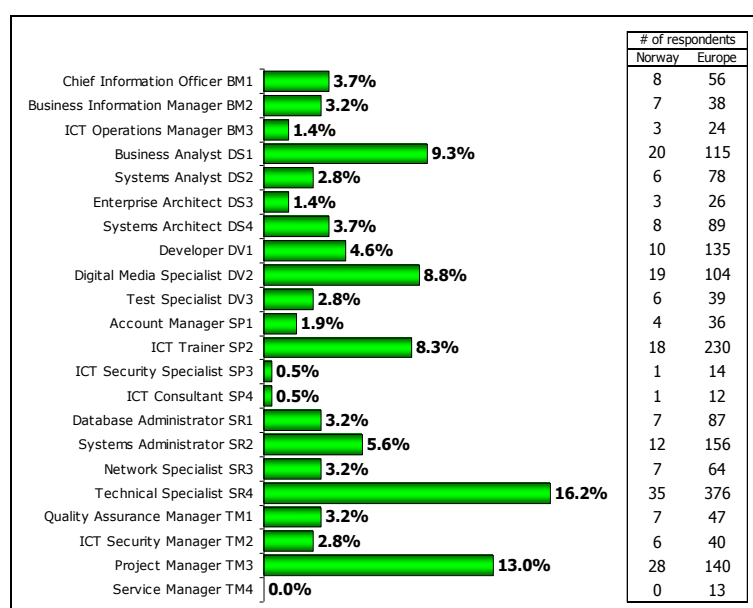


Figure 13 Respondents Distribution by Proximity Profile

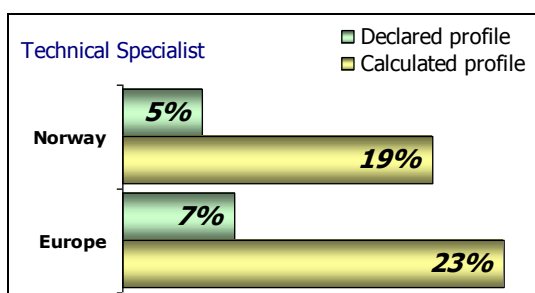
A high rate of respondents fit the roles of Technical Specialist, Project Manager, Business Analyst, Digital Media Specialist and ICT Trainer. However, the Technical Specialist profile shows a lower rate of proximity compared to the European average (16.2% vs. 19.6%); this is also the case for ICT Trainer (8.3% vs. 12%). As regards the Business Analyst and Digital Media Specialist profiles, Norwegian results are slightly higher than the European ones (9.3% vs. 6% for Business Analyst and 8.8% vs. 5.4% for Digital Media Specialist). Lastly, the Project Manager rate shows the highest gap compared to the European average: 13% vs. 7.3%.

### 6.2 Comparison between Professional Profile and Proximity Profile

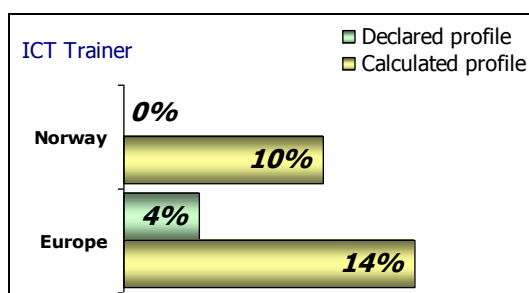
An analysis of the profile selected by ICT practitioners and the Proximity Profile, i.e. the profile that fits best with the competences that were declared, shows a large variance for many of the profiles in the case of Norway in this sample.

As can be seen in [Figure 14](#), the Technical Specialist profile was only declared by 5% of respondents in Norway. However an analysis of the Norwegian respondents' competences leads to 19% of them having the necessary competences for that role.

This trend, although with a slightly smaller gap, is replicated across Europe, as seen in [Figure 14](#), where only 7% of European respondents declared to be Technical Specialist, but 23% of practitioners had the required competences for this role.



**Figure 14 Technical Specialist: Declared and Calculated Profile**

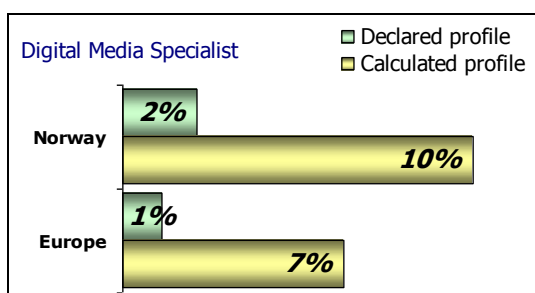


**Figure 15 ICT Trainer: Declared and Calculated Profile**

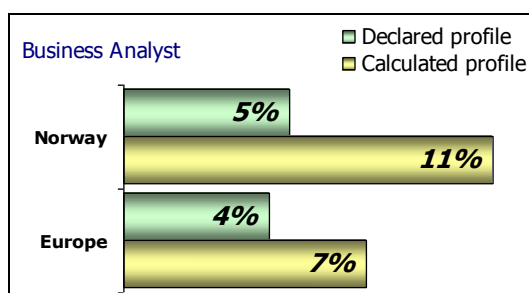
In Norway, this is also noticeable with ICT Trainers. None of the respondents selected this profile in the sample, even though 10% of all respondents in Norway actually hold the necessary competences for this role. This trend is replicated across Europe, as seen in [Figure 15](#), where only 4% of European respondents declared they were ICT Trainers, but 14% of all practitioners held the required competences.

Similarly, for the Digital Media Specialist profile, the results show that only 2% declared this profile, but 10% were seen to have the competences associated with it after their evaluation. As [Figure 16](#) reveals, the same situation appears across Europe, although with a smaller gap: only 1% declare to be Digital Media Specialists, but 7% of all respondents have the competences for the role.

The Business Analyst profile also shows a variance between the declared and the calculated profile. 5% of Norwegians declared to have this role, but almost twice of respondents (11%) actually had the competences associated with it. The same trend is observed at European level, although with a much smaller gap: 4% claim to be Business Analyst, but 7% have the appropriate competences (see [Figure 17](#)).



**Figure 16 Digital Media Specialist: Declared and Calculated Profile**



**Figure 17 Business Analyst: Declared and Calculated Profile**

A different situation emerges for the Test Specialist profile: 8% of Norwegian ICT practitioners declare themselves to be Test Specialists, but only 3% have the required competences. This trend is not observed at European level (see [Figure 18](#)).

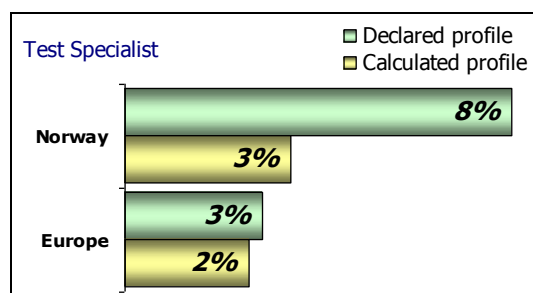


Figure 18 Test Specialist: Declared and Calculated Profile

In general, the difference between the declared and the calculated professional profile highlights the importance of the level of competence granularity to build up each profile. The Proximity Profiles are created on the basis of the competences (and their proficiency levels) as self-evaluated by respondents, and combined with an appropriate algorithm that calculates the Proximity Profile. In contrast, the declared profiles are simply selected by the respondent according to the job title they hold. The declared profiles can differ greatly from the calculated profile as a result. Only 24% of the declared profiles of Norwegian respondents match the calculated profile (23% is the European average).

For this reason, only the data from the calculated profiles is used for analysis: the calculated profile is a more precise profile.

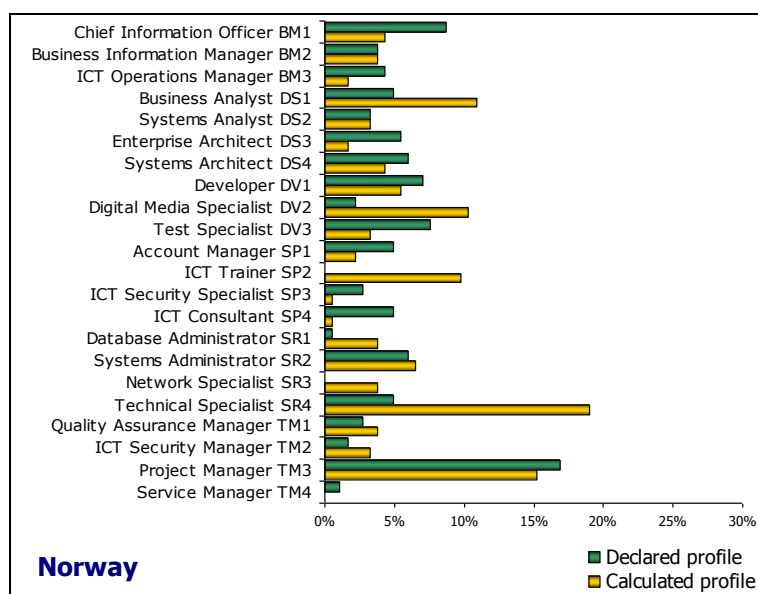


Figure 19 Comparison of Declared Profile and Proximity Profile

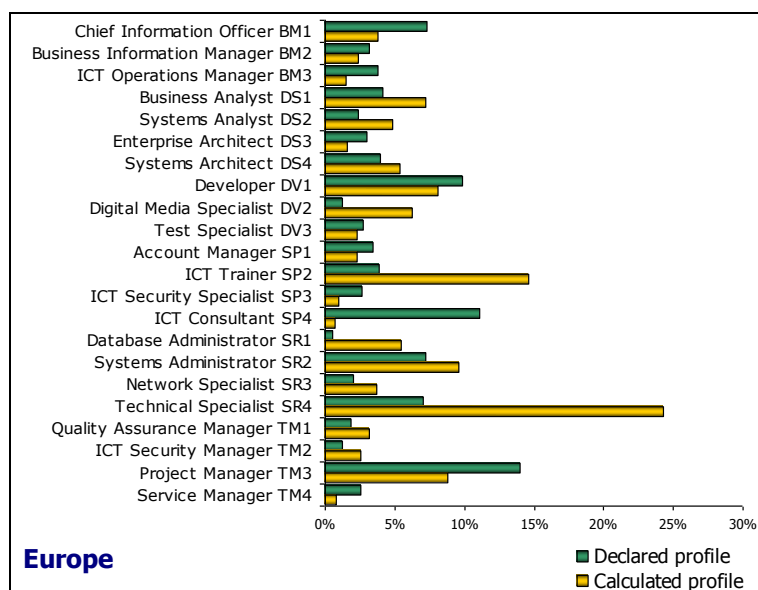


Figure 20 Comparison of Declared Profile and Proximity Profile

### 6.3 Analysis of Competence Proficiency Index

Figure 21 provides a comparison of the Norwegian, and European averages of the Competence Proficiency Index (CPI) for the five competence areas: Plan, Build, Run, Enable, and Manage.

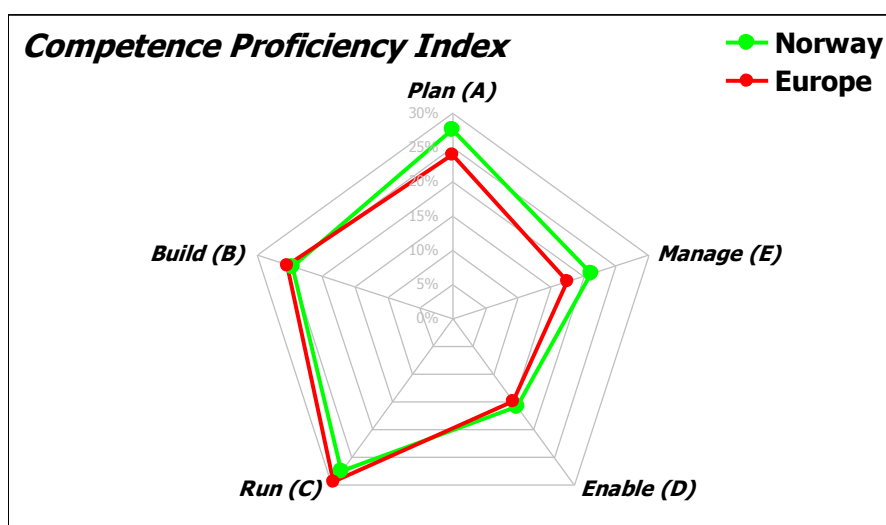


Figure 21 Competence Proficiency Index by Competence Areas

In Norway, it appears that the Competence Proficiency Index is slightly higher in this sample than the equivalent for Europe in three areas and lower for the two others. The full value of each CPI is 100%. Compared with the European average, greater differences appear in the Plan area (27.5% vs. 23.9%) and in the Manage area (21.1% vs. 17.6%), both showing a +3.5% gap in favour of Norway. The Norwegian CPI for the Build and Run areas are lower than the European average: Build 24.5% vs. 25.1%, and Run 27.4% vs. 29.4%. Lastly, it appears that the Enable area is the weakest, both for Norway and Europe (16% vs. 15.1%).

The profile that has the highest CPI in the Plan area is Business Analyst; in the Build area, the highest CPI is reached by the Digital Media Specialist profile; while in the Run area, the leading profile is Technical Specialist. As regards the Enable area, the best score belongs to Business Analyst. The Business Analyst profile gains the top score in the Manage area, as well.

A deeper analysis of the Competence Proficiency Indexes of each competence area is fundamental in order to design detailed training paths to cover the competence gaps for each Proximity Profile of each respondent.

The following chart ([Figure 22](#)) shows the average CPI for all Norwegian respondents.

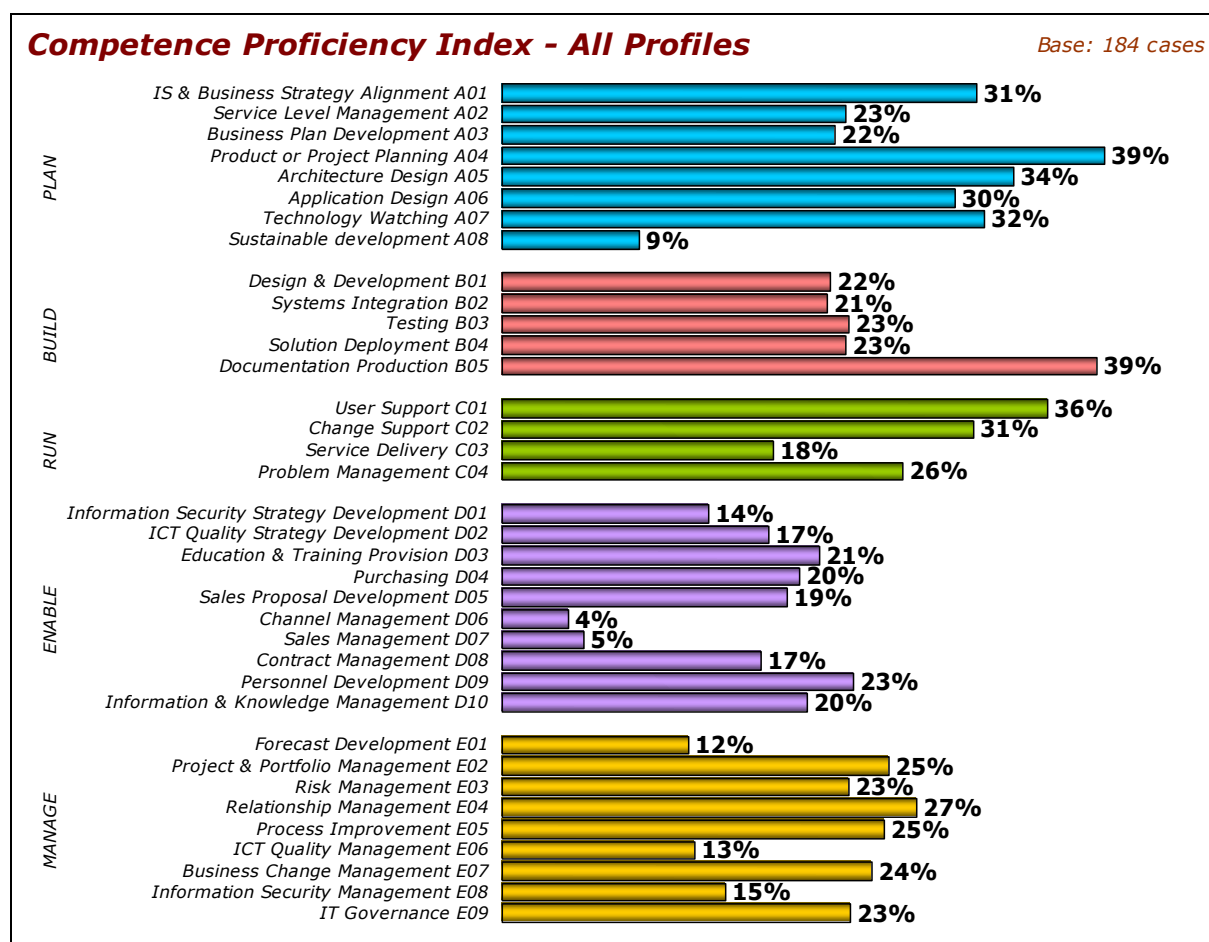


Figure 22 Competence Proficiency Index



## 7 Profiles Analysis

The answers collected generated 202 Proximity Profiles in relation to 22 ICT professional profiles ([Figure 13](#)). The eligibility criteria for the analysis of these profiles were the following:

- 10 or more cases per country for each profile,
- a Proximity Profile score higher than 40%.

Following this criteria, the following 7 profiles for Norway were selected and analysed:

1. Business Analyst
2. Developer
3. Digital Media Specialist
4. ICT Trainer
5. Systems Administrator
6. Technical Specialist
7. Project Manager

A deeper analysis of the data for each of these 7 profiles is presented in this chapter.

### 7.1 Business Analyst

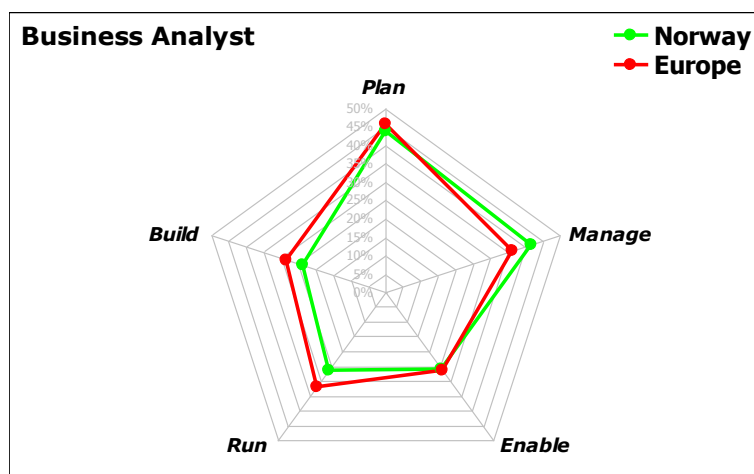


Figure 23 Competence Proficiency Index – Business Analyst

95% of Norwegian Business Analysts in the sample have obtained a university degree or higher, this is slightly higher than the European average of 93%. When it comes to high level education, the difference is more noticeable: 70% of Norwegian Business Analysts have obtained a fourth level qualification (master's degree or PhD), while the European average is 60%. Along with the Developer profile, Business Analyst is one of the profile showing the highest rate of graduates with a fourth level qualification among Norwegian ICT professionals.

In Norway, 60% of Business Analysts have an IT-focused background; this is almost equal to the national average (59%) and to the European average for this role (61%)

A large majority of Business Analysts who responded were male (95%), which is higher than the 79% male proportion for all Norwegian respondents and 8% higher compared to the 87% European average in the role in this sample. Business Analyst is the profile showing the lowest proportion of women (5%) in Norway.

The average Norwegian Business Analyst is 47 years old, the second oldest ICT professional in the country, about 3 years older than the average European Business Analyst (44 years old).

Norwegian Business Analysts show a higher Competence Proficiency Index than the European average for this profile only in the Manage area (41% vs. 36%). As regards the other areas, the gap ranges from 0 percentage points (Enable Area) to -5.3 (Run Area). The CPI observed for Norwegian Business Analysts and their European equivalent is: 26% vs. 26% in the Enable Area; 44% vs. 46% in the Plan area; 24% vs. 28% in the Build area, and 26% vs. 32% in the Run area.

Norwegian Business Analysts reach their highest CPIs in Process Improvement (81%), IS & Business Strategy Alignment (68%), Documentation Production (58%), Business Plan Development (56%), and Architecture Design (54%).

In comparison with the European average, the CPI for the Norwegian Business Analyst profile shows a higher score especially in Documentation Production (+11%) and Risk Management (+11%) while the biggest gaps are observed in Testing (-10%), Change Support (-10%), Application Design (-13%), and Solution Deployment (-14%).

## 7.2 Developer

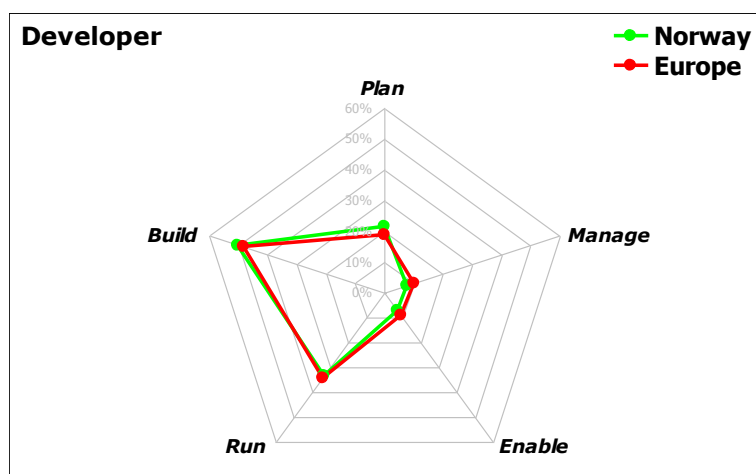


Figure 24 Competence Proficiency Index – Developer

All Norwegian Developers in the sample have obtained a university degree or higher; which is significantly higher than the 75% of Developers in the rest of Europe. Moreover, 70% of Norwegian Developers have obtained a fourth level qualification (master's degree or PhD), which is noticeably higher than the European average of

37%, and also higher than the domestic rate (46%). In Norway, 80% of Developers have an IT-focused education; this is higher than the average domestic rate (59%) and also compared to 73% of all Developers in Europe. Alongside Business Analyst, the Developer profile is one of the two profiles showing the highest rate of graduates with a fourth level qualification among Norwegian ICT professionals.

The average Developer in Norway is 41 years old, almost 3 years older than the European average and about 5 years younger than the Norwegian average.

A substantial number of Developers who responded were female (40%), which is the highest rate among Norwegian profiles. This is almost twice the average domestic rate (21%) and the European average (18%) for this profile in this sample. This is partly explained by the higher participation of women in the Norwegian work force.

All Norwegian Developers declared themselves to be full-time employees (the European average is 67%), and 50% of them are working in large organisations, a rate equal to their European colleagues.

Norwegian Developers show a better Competence Proficiency Index than the European average for this profile in two of the five areas, differences ranging from -2.0% to +2.7%. The results in detail are: Plan area 22% vs. 19%, Build area 50% vs. 48%, Run area 33% vs. 34%, Enable area 7% vs. 9%, and Manage area 8% vs. 10%.

For Norwegian Developers, the best CPIs can be found in Documentation Production (65%), Application Design (57%), Design & Development (52%), and Systems Integration (47%). Comparing these results to the European average for this profile reveals some negative gaps: Information Security Strategy Development (-13%), Process Improvement (-13%), and Documentation Production (-8%). On the positive side, the widest gaps can be found for Application Design (+13%), IS & Business Strategy Alignment (+12%), and Relationship Management (+8%).

### 7.3 Digital Media Specialist

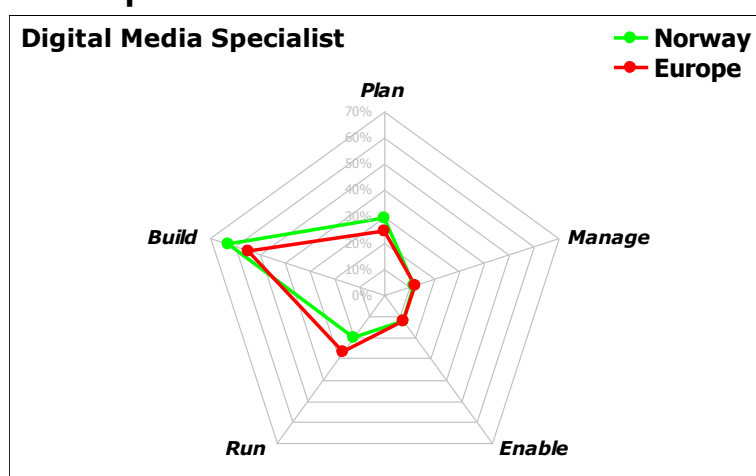


Figure 25 Competence Proficiency Index – Digital Media Specialist

All Norwegian Digital Media Specialists in the sample have obtained a university degree or higher, which is higher than the European average of 90%. However, only 47% of Norwegian Digital Media Specialists have obtained a fourth level qualification (master's degree or PhD), which is close to the European average of 43%. In Norway, 90% of Digital Media Specialists have an IT-focused education; this is higher than the general Norwegian average (59%), but quite close to the 85% of Digital Media Specialists in Europe.

The average Digital Media Specialist is 43 years old, almost 2 years younger than the Norwegian average, but 4 years older than their European colleagues, who are on average 39 years old.

A large majority of the Digital Media Specialists who responded were male (90%). This is higher than the 79% male proportion for all Norwegian respondents, but very close to the European average for that profile in this sample (87%).

All Norwegian Digital Media Specialists are full-time employees, while the European average for this profile is 80%. More than a third (42%) of them work in large organisations (+1,000 employees), a rate similar to their European colleagues (European average: 46%).

Norwegian Digital Media Specialists show a higher Competence Proficiency Index in two areas, compared to the European average. Positive differences range from +7.9% (Build area, 62.3% vs. 54.4%) to +4.7% (Plan area, 29.0% vs. 24.3%). The Run area shows the worst result: -6.2% (20% vs. 26.3%). Intermediate values, showing very small gaps, are the Enable area (12.1% vs. 12%) and the Manage area (11.8% vs. 12.1%).

For Norwegian Digital Media Specialists, the best CPIs can be found in Documentation Production (82%), Solution Deployment (68%), Application Design (68%), and Design & Development (66%). The variance with the European average CPI shows the Norwegian Digital Media Specialist in a positive light as regards the Plan and Build competences, but in a negative light as regards the Run competences. Major positive differences can be found for Documentation Production (+10%), Systems Integration (+10%), Design & Development (+9%), Application Design (+8%), Solution Deployment (+8%), and Risk Management (+8%). CPI worse than the European average are found for User Support (-7%) and Service Delivery (-9%).

## 7.4 ICT Trainer

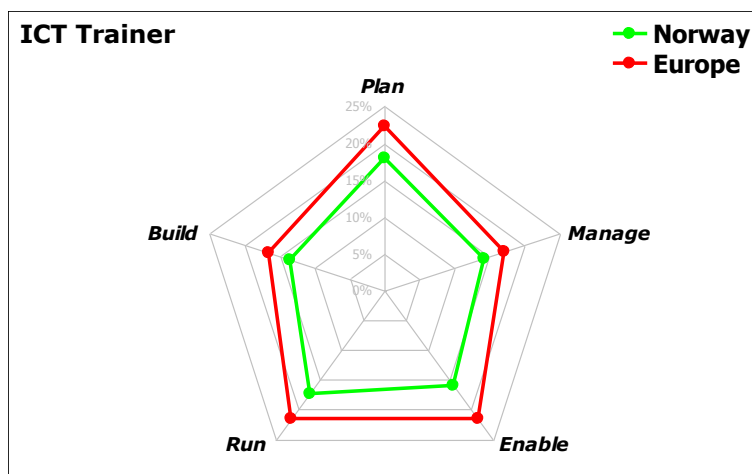


Figure 26 Competence Proficiency Index – ICT Trainer

All Norwegian ICT Trainers in the sample have obtained a university degree or higher, while the rate for ICT Trainers in Europe is 91%. This is one of the profiles showing the highest rate of graduates among Norwegian ICT professionals. Moreover, 67% of Norwegian ICT Trainers have obtained a fourth level qualification (master's degree or PhD), which is clearly higher than the European average of 53%. In Norway, only 44% of ICT Trainers have an IT-focused education; this is lower than the Norwegian average of 59%, and lower than the average for ICT Trainers in Europe (59%).

The ICT Trainer is the oldest professional among all ICT professionals in Norway. The average Norwegian ICT Trainer is 50 years old, almost five years older than the average European ICT Trainer (45 years old).

The majority of ICT Trainers respondents were male, however, this profile shows the second highest rate (25%) of female participation among all Norwegian ICT profiles (33%) and even among European profiles in this sample.

All Norwegian ICT Trainers declared themselves to be full-time employees (the European average is 75%), and 41% of them work in large organisations (+1,000 employees), a rate higher than their European colleagues (34%).

Norwegian ICT Trainers show a worse Competence Proficiency Index than the European average in each of the five areas: Plan: 18% vs. 22%, Build: 13% vs. 17%, Run: 17% vs. 22%, Enable: 16% vs. 21%, and Manage 14% vs. 17%.

The Competence Proficiency Index for Norwegian ICT Trainers gains its best results in Education & Training Provision (64%), Documentation Production (35%), Personnel Development (34%), and Architecture Design (30%).

Comparing the Norwegian CPI results to the European average does not reveal remarkable positive differences other than in IT Governance (+7%). Nonetheless, major negative differences can be found in Problem Management (-9%), Project &

Portfolio Management (-10%), ICT Quality Strategy Development (-11%), and Product or Project Planning (-11%).

## 7.5 Systems Administrator

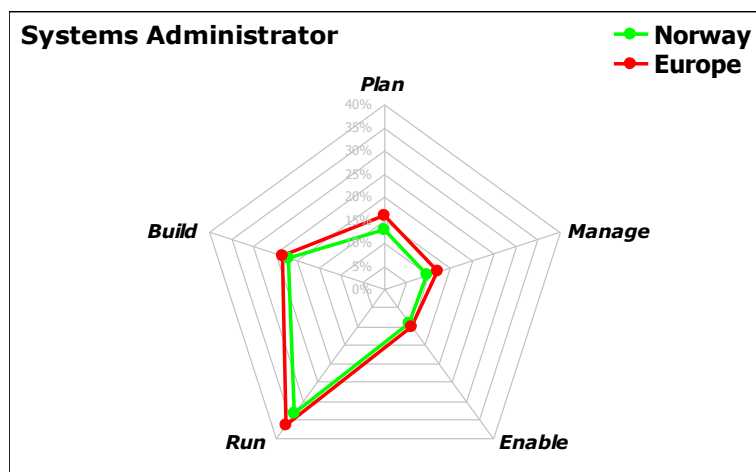


Figure 27 Competence Proficiency Index – Systems Administrator

92% of Norwegian Systems Administrators in the sample have obtained a university degree or higher, a higher rate than the 79% of Systems Administrators in Europe. Moreover, only 25% of Norwegian Systems Administrators have obtained a fourth level qualification (master's degree or PhD), which is only slightly higher than the European average of 23%. In Norway, half of the Systems Administrators have an IT-focused education, which is lower than the Norwegian general average of 59%, and is 22% lower than their European colleagues (72%).

The Norwegian Systems Administrator is the youngest ICT professional in Norway. The respondents are on average 39 years old, one year younger than their European colleagues (38 years old on average).

The majority of Systems Administrators who responded were male (75%), which is slightly above the 79% male proportion for all Norwegian respondents, but quite far from the European average (87%) for this role in this sample.

All Norwegian Systems Administrators declared themselves to be full-time employees, while the European average is at 75% for this role.

Systems Administrator in Norway, as well as in Europe, is the ICT profile which has the lowest proximity rate: 67%. An explanation for this low rate could be that it is more difficult to meet all the required competences for this profile.

In Norway, Systems Administrators show Competence Proficiency Indexes that are lower than the European average in all areas. The detailed results are as follows: Plan area: 12.9% vs. 15.8%, Build area: 21.7% vs. 23.2%, Run area: 33.3% vs. 36.3%, Enable area: 9.3% vs. 9.9%, and Manage area: 9.8% vs. 12%.

For Norwegian Systems Administrators, the best CPIs are in User Support (64%), Documentation Production (36%), Testing (33%), and Change Support (32%). Noteworthy positive differences can be found only for Personnel Development (+14%). The widest negative gaps appear for Application Design (-9%), Business Change Management (-9%), Technology Watching (-10%), Information Security Strategy Development (-10%), and Information Security Management (-10%).

## 7.6 Technical Specialist

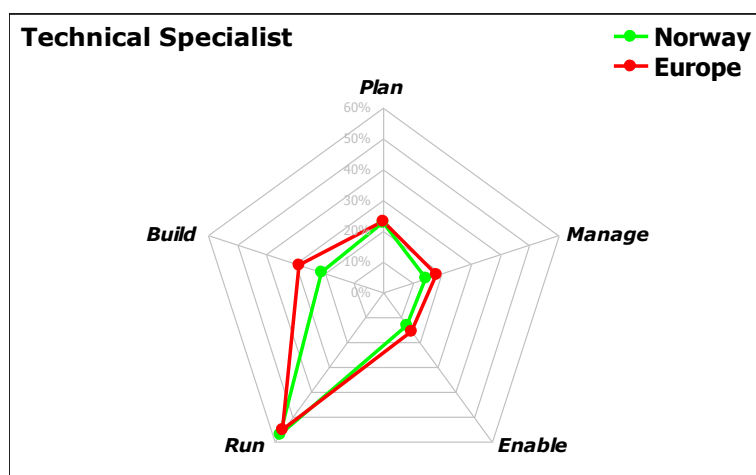


Figure 28 Competence Proficiency Index – Technical Specialist

74% of Norwegian Technical Specialists in the sample have obtained a university degree or higher; this is the lowest rate among Norwegian profiles (90%), and it is also lower than the European average for this profile (79%). Only 26% of Norwegian Technical Specialists have obtained a fourth level qualification (master's degree or PhD), which is the same as the European average, but is only slightly more than half the Norwegian average for all ICT professionals (46%). In Norway, 57% of Technical Specialists have an IT-focused education; this rate is significantly lower than the 68% average of European colleagues, but it is very close to the 59% of all Norwegian respondents.

Norwegian Technical Specialists are on average 46 years old. This is about 4 years older than their European colleagues (42 years), but only around one year older than the average of all Norwegian ICT professionals (45 years).

A large majority of Technical Specialists who responded were male (89%), which is a higher percentage than the proportion of respondents from all Norway (79%), but it is in line with the European average in this sample (89%).

Norwegian Technical Specialists show worse Competence Proficiency Index than the European average in all areas except in the Run area (57% vs. 55%). Gaps range from -0.4% to -3.6%: Plan area: -0.4% (23% vs. 23%), Build area: -7.4% (21% vs. 29%), Enable area: -2.6% (13% vs. 16%), and Manage area: -3.6% (14% vs. 18%).



Regarding the Competence Proficiency Index, Norwegian Technical Specialists gain their best results in all the competences of the Run area: Change Support (73%), Problem Management (56%), User Support (54%), and Service Delivery (48%).

Comparing the Norwegian CPI results to the European average reveals negative variances for Solution Deployment (-12%), Systems Integration (-9%), Information Security Strategy Development (-9%), and Information Security Management (-8%). On the positive side, the Norwegian CPIs for this profile are higher for Product Technology Watching (+6%), IS & Business Strategy Alignment (+4%), and Service Level Management (+4%)

## 7.7 Project Manager

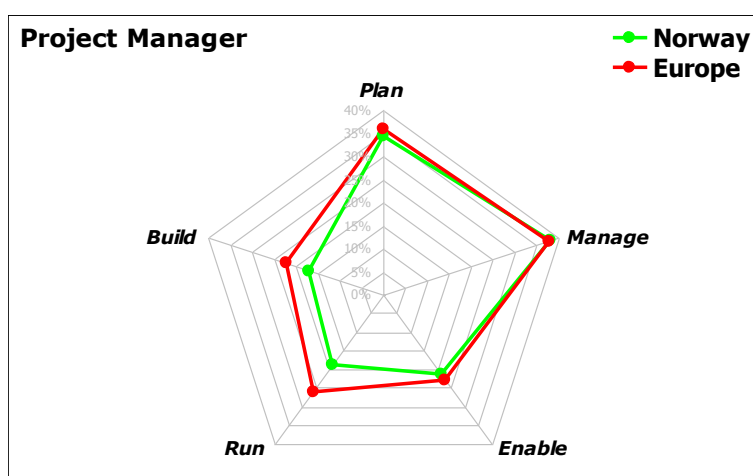


Figure 29 Competence Proficiency Index – Project Manager

The majority (86%) of Norwegian Project Managers surveyed in the sample have obtained a university degree or higher; this is slightly lower than the rate of Project Managers in Europe (89%) and the national average (90%). A negligible difference is found in the fourth level qualification rate: half of the Norwegian Project Managers have obtained a fourth level qualification (master's degree or PhD), which is very close to the European average of 54%. This is the profile showing the lowest rate of ICT professionals with an IT-focused education: only 43% of Norwegian Project Managers have an IT-focused background, which is lower than the 59% of all Norwegian respondents, but quite similar to the 48% of European Project Managers.

About one third of the Project Managers who responded were female (32%), which is far higher than the 21% female proportion for all Norwegian respondents, and close to the 25% European average. However, Project Manager (as well as ICT Trainer) is one of the profiles showing the highest rate of women, both in Norway and in Europe.

The average Norwegian Project Manager is 44 years old, the same age as his/her European colleagues, and about one year younger than the average for ICT professionals in Norway in this sample (45 years old).



93% of Project Managers declared themselves to be in full-time employees; this is the lowest rate for among Norwegian profiles, however it is still higher than the European average of 83%.

In Norway, Project Managers show quite a low Competence Proficiency Index compared to the European average for the profile in four areas: the Plan area with 34% vs. 66%, the Build area with 17% vs. 22%, the Run area with 19% vs. 26%, and the Enable area with 21% vs. 23%. In the Manage area, Project Managers score a slightly better index (38%) than their European colleagues (37.6%).

Norwegian Project Managers gain their best Competence Proficiency Index in Product or Project Planning (67%), Project & Portfolio Management (61%), Relationship Management (55%), Business Change Management (53%), and Risk Management (52%).

The most significant differences in comparison to European colleagues are in Business Plan Development (+8%), Contract Management (+7%), Risk Management (+5%), and Business Change Management (+5%). On the negative side, the most remarkable differences are found in the following competences: Testing (-9%), Personnel Development (-10%), Service Delivery (-11%), Change Support (-13%), and Application Design (-14%).

National experts indicate that these differences lead to questions about whether Norwegian project managers have a role that is different from their European colleagues. If their assignment is more managerial than hands-on (manage) and focused on the project and not the hand-over to the organization (more plan and build than run) that would be consistent with the results.

## 8 Conclusions

The following section draws conclusions based on the analysis of 7 profiles that arose from the 184 respondents in Norway.

The data gathered in this phase of the CEPIS e-Competence Benchmark research shows a high degree of interest from professionals in reflecting on their own competences and shows how the e-CF provides an effective basis for this. However, 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 the computer society could prove to be biased and not fully representative of the total community of local ICT professionals in Norway.

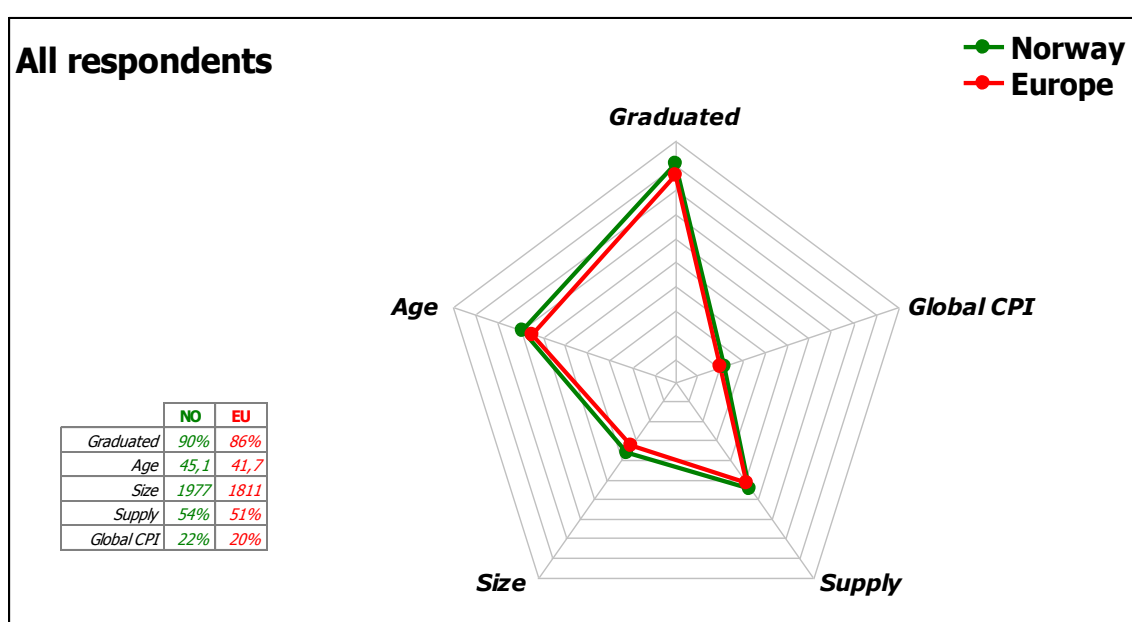
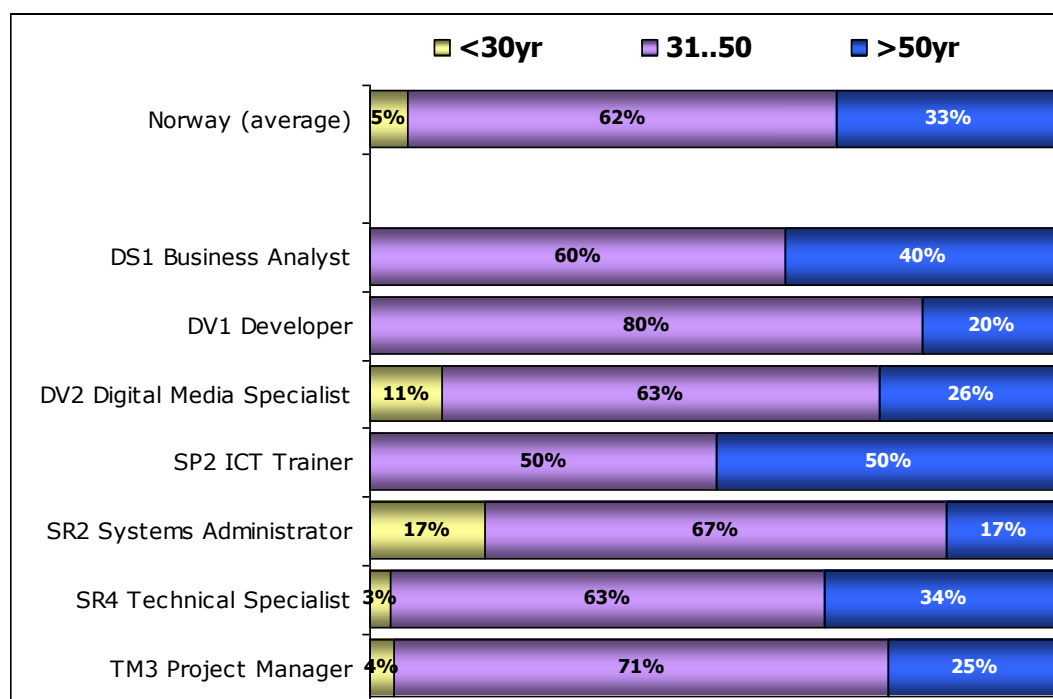


Figure 30 The Norwegian Respondents Profile

The average profile of the Norwegian respondent ([Figure 30](#)) differs from the European average profile essentially by being older (+3.4 years) and by having a higher number of graduates (+4%).

The analysis of segmentation per profile and by age (see section 6.1.1) shows that the general average age is around 45 years in Norway, while the European average age is 42 years. As in other countries, for Norway there is a need to attract younger people to the ICT profession without losing the experience of the older age group. The data shows that there are a number of profiles with a very low rate of professionals under 30 (5% is the European rate). [Figure 31](#) below shows the distribution for each profile of Norwegian ICT professionals by age ranges.



**Figure 31 Profile Distribution by Age Range**

The segmentation of the profiles by gender (section 6.1.2) provides evidence that female representation in ICT in Norway is still limited, even if better than most other countries across Europe. The presence of women is lower than 15% in three profiles (with 5% for the Business Analyst profile, 11% for the Digital Media Specialist, and 11% as well for the Technical Specialist profile). The highest rate is found among Developers (40%). National experts believe that Norway has been leading efforts for gender balance in education and in the workforce, even though gender parity is a long way away.

The results of the educational level (section 6.1.3 and 6.1.4) suggest that in Norway there is a high level of attainment of degrees compared with other countries. For most of the 7 analysed profiles, the Norwegian rate is higher than the corresponding European rate, and in three profiles the Norwegian rate shows a gap wider than 10%: Digital Media Specialist (+10%), Systems Administrator (+13%), and Developer (+25%).

With regards to the profile distribution by IT-focused education, there is evidence to suggest that only a few profiles have a sufficient level of IT-focused education. In fact, only three profiles (Project Manager, Systems Administrator and ICT Trainer) count for half of ICT professionals without an IT-focused education. There appears to be no correlation between age and education for these profiles.

Results show no strong predominance of the IT demand or supply side (section 6.1.5). Profiles main on the IT demand side are ICT Trainer (61% Demand), Systems Administrator (58% Demand), and Business Analyst (55% Demand). On the IT supply side, the most popular profiles are Digital Media Specialist (53% Supply), Developer (60% Supply), and Technical Specialist (63% Supply). The Project Manager profile shows a perfect balance between demand and supply with 50%-50%.

For the level of Competence Proficiency Index (section 3.3) of Norwegian respondents, it appears that the results compare favourably to three of the five areas at European level: the Plan area (27% vs. 24%), Enable area (16% vs. 15%), and Manage area (21% vs. 18%). On the other side, results show a small gap in the Build area (24% vs. 25%) and in the Run area (27% vs. 29%). A deeper analysis of the Competence Proficiency Indexes compared to each profile requirement is fundamental in order to design detailed training paths to cover the competence gaps for each Proximity Profile of each respondent.

Some interesting results arose when comparing the competencies of ICT professionals working in micro/small organisations (1-50 employees) with those working in medium/large organisations (more than 50 employees). [Figure 32](#) shows an overall lower level of competence in micro/small organisations. National experts confirmed these findings as expected with smaller organisations have larger competence gaps than larger ones.

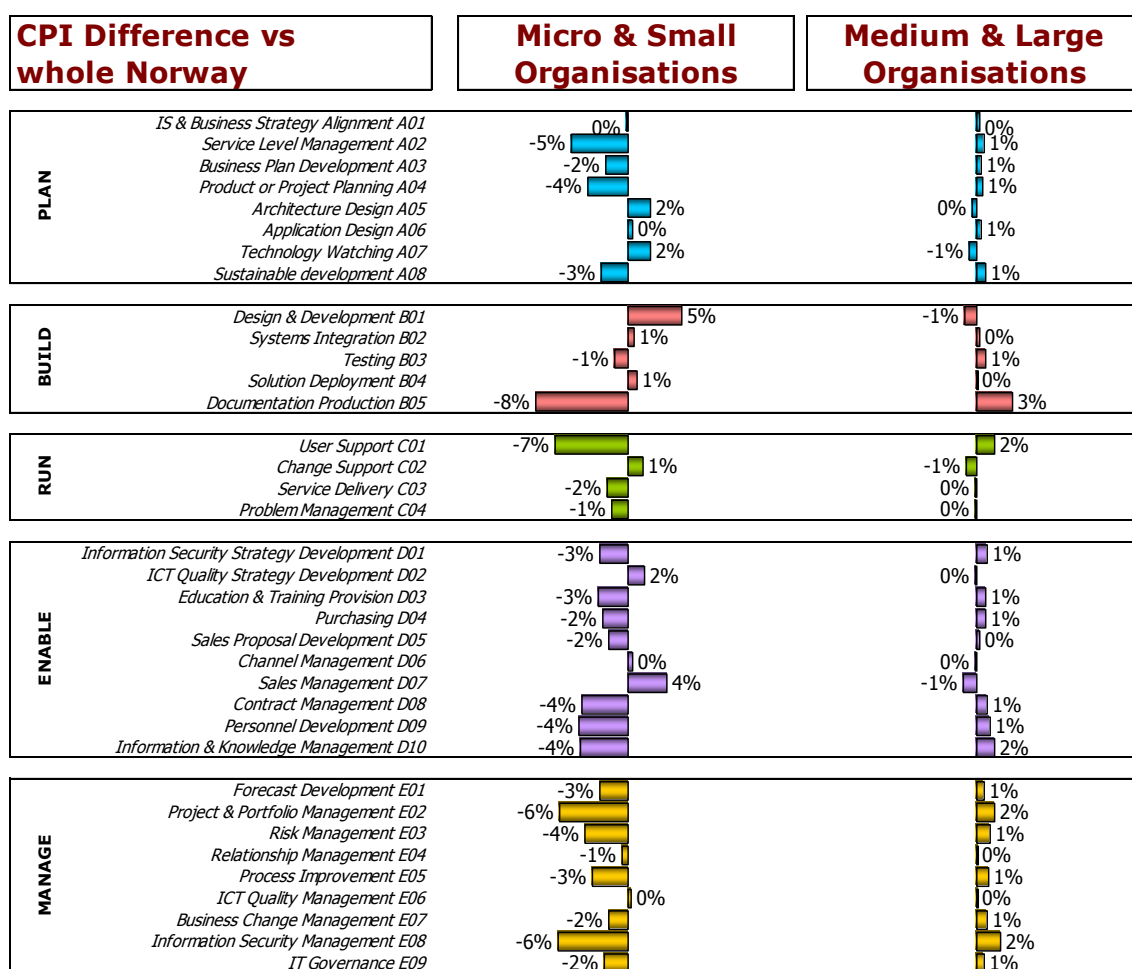


Figure 32 CPI Difference versus whole Norway

The following chart ([Figure 33](#)) reveals the difference between the CPI in Norway and the corresponding European average CPI.

In general, Norwegian CPIs are higher than the European average, but they do not present significant gaps. The largest variance, higher than the European CPI, appears for IS & Business Strategy Alignment (+8.5%), Product or Project Planning (+7.6%), Risk Management (+6.6%), Business Change Management (+6.4%), and IT Governance (5.0%). On the other hand, Norwegian CPIs are lower than the European CPI for Service Delivery (-3.5%), Systems Integration (-3.1%), Problem Management (-3.0%), and Information Security Strategy Development (-3.0%).

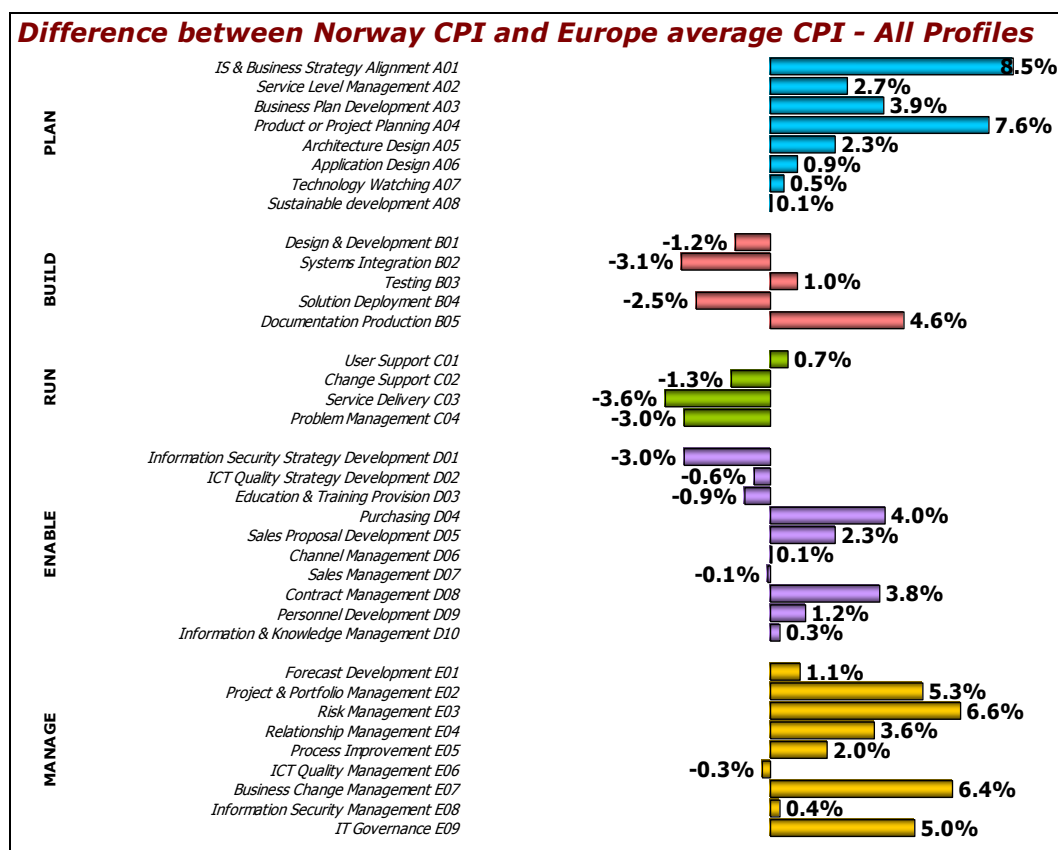


Figure 33 Competence Proficiency Index – Differences to European Average

A deeper analysis of the Competence Proficiency Indexes of each competence area is fundamental in order to design detailed training paths to cover the competence gaps for each Proximity Profile of each respondent.

For example, the analysis of the five main competences of the Project Manager profile reveals that Norwegian Project Managers score higher than their European colleagues: +2% for Relationship Management and Project & Portfolio Management, +3% in Product or Project Planning, and +5% in Business Change Management and Risk Management.

## 9 Annex

### 9.1 Proximity Profiles – Overview

#### 9.1.1 Profile Distribution by Age

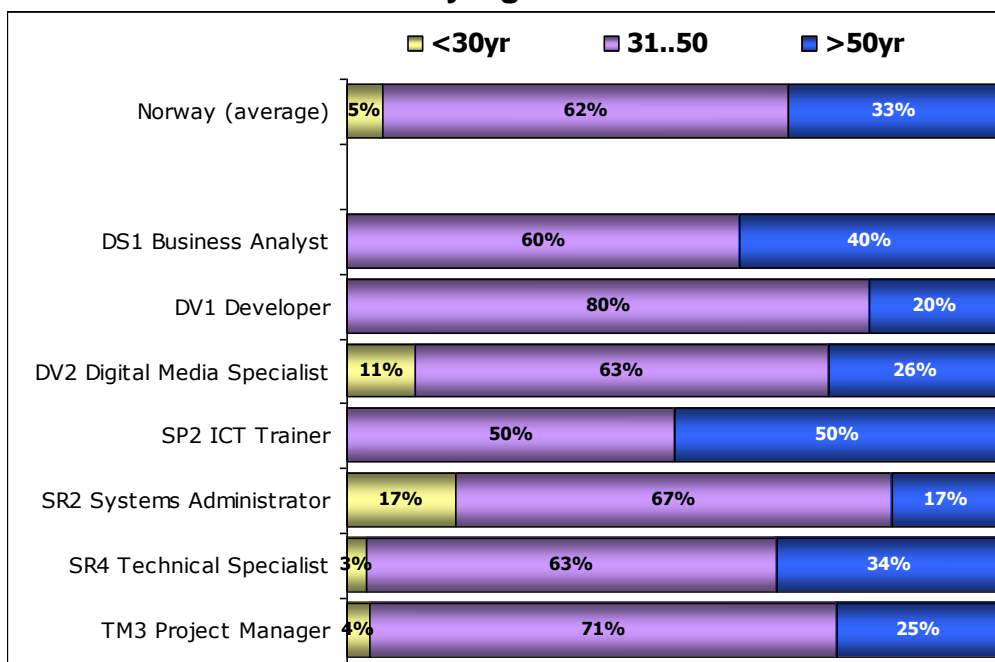


Figure 34 Proximity profiles - profile distribution by age

#### 9.1.2 Profile Distribution by Gender

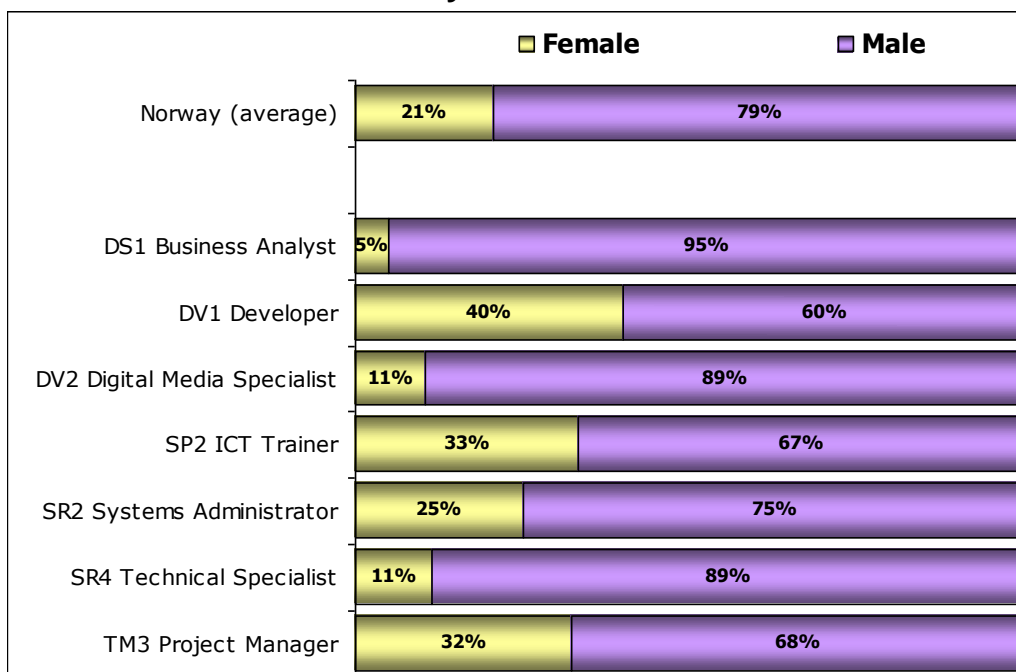


Figure 35 Proximity profiles - profile distribution by gender

### 9.1.3 Profile Distribution by Education Level

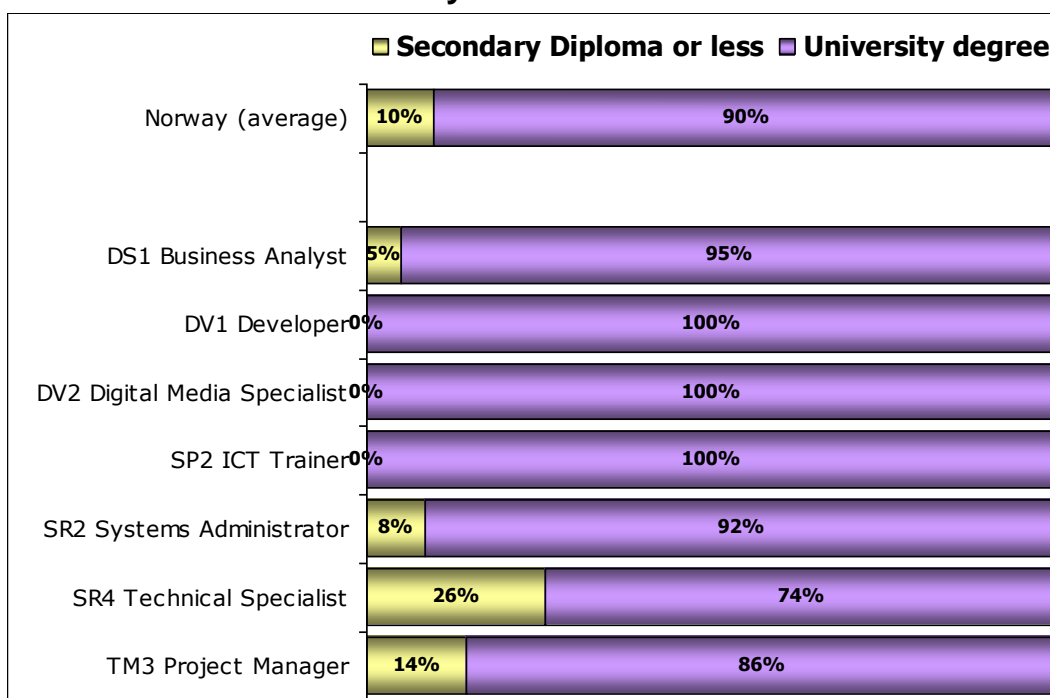


Figure 36 Proximity profiles - profile distribution by education level

### 9.1.4 Profile Distribution by IT Education

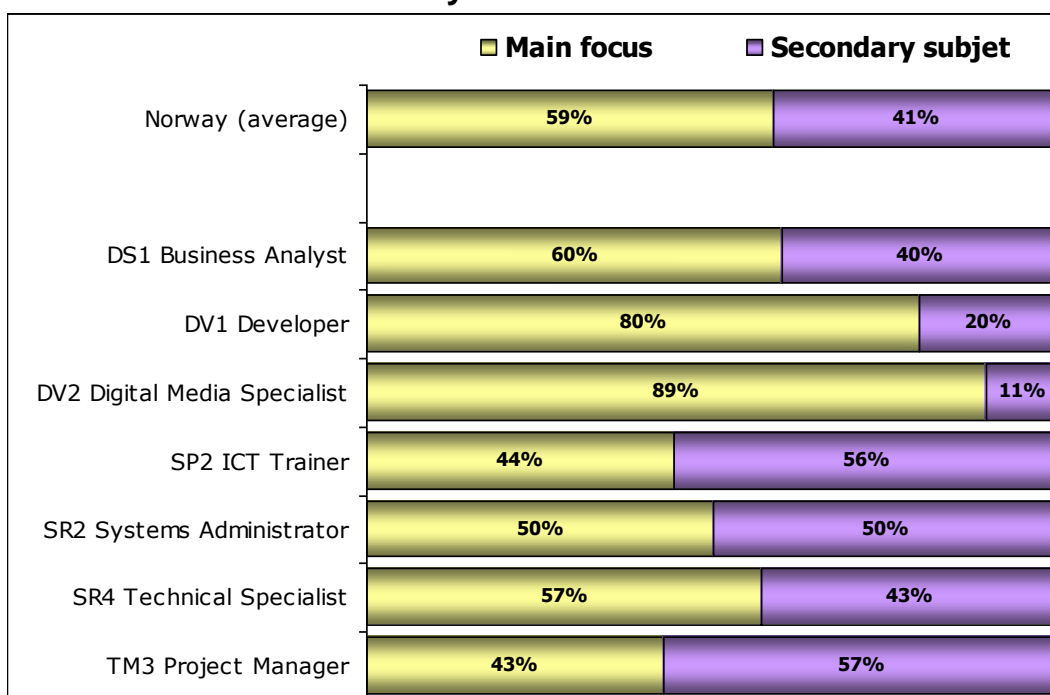


Figure 37 Proximity profiles - profile distribution by IT education

### 9.1.5 Profile Distribution by Industry

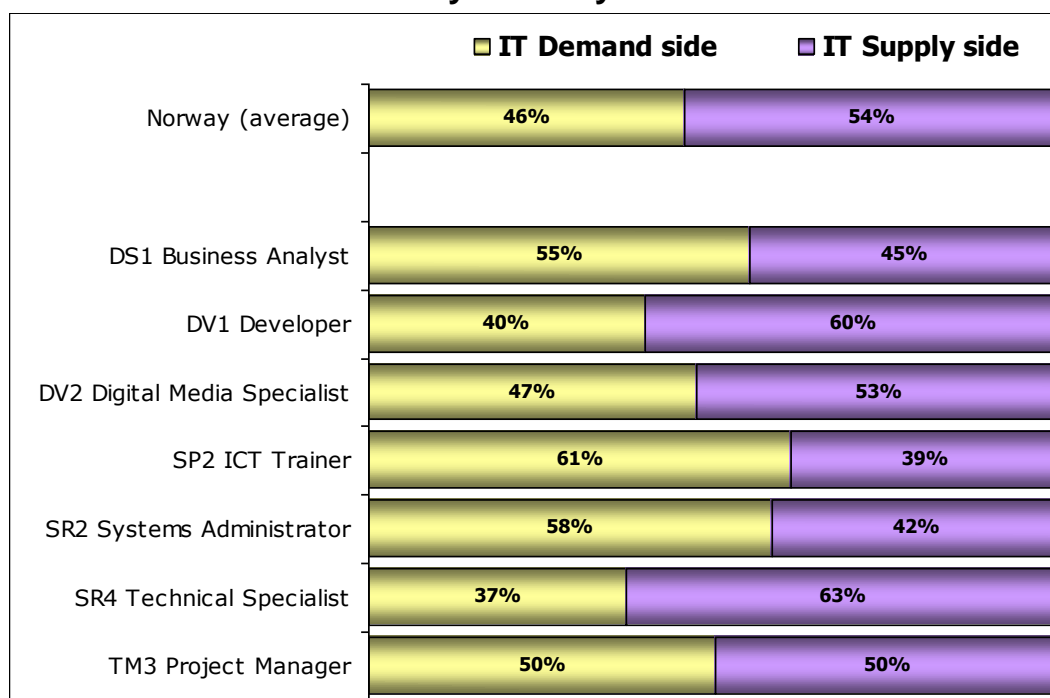


Figure 38 Proximity profiles - profile distribution by industry

### 9.1.6 Profile Distribution by Enterprise Size

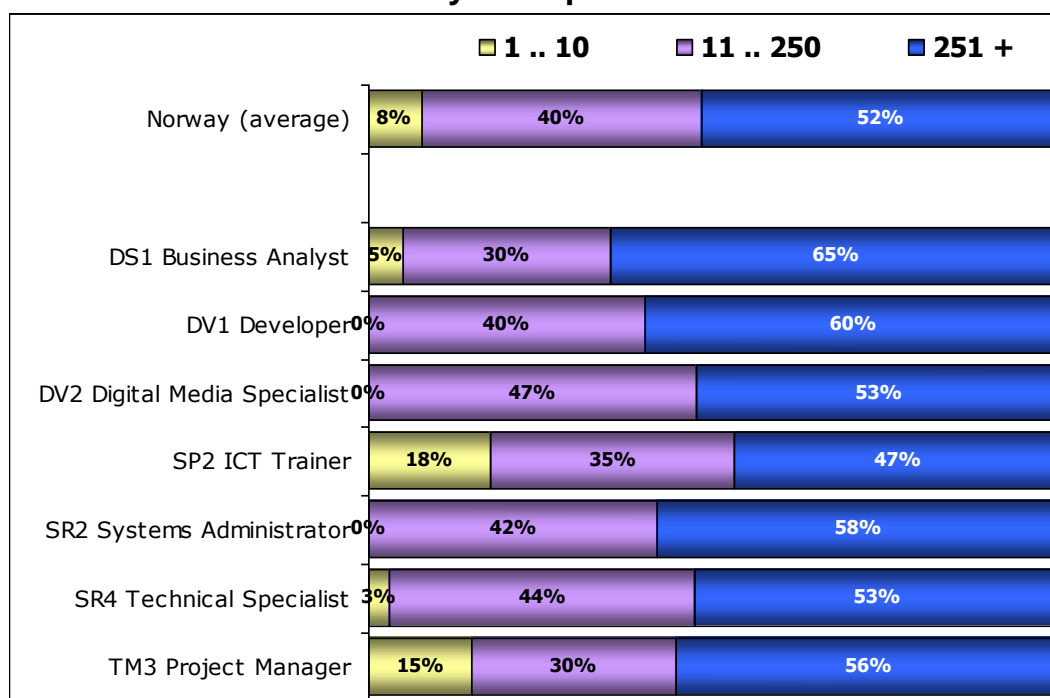


Figure 39 Proximity profiles - profile distribution by enterprise size



## 9.1.7 Profile Summary Table

	Europe	Norway	DS1 Business Analyst	DV1 Developer	DV2 Digital Media Specialist	SP2 ICT Trainer	SR2 Systems Administrator	SR4 Technical Specialist	TM3 Project Manager
<b>Cases</b>	<b>1604</b>	<b>184</b>	<b>20</b>	<b>10</b>	<b>19</b>	<b>18</b>	<b>12</b>	<b>35</b>	<b>28</b>
<b>Age</b>									
Mean	41.7	45.1	47.0	41.0	43.4	50.0	39.2	45.6	43.9
<30 yr	16%	5%	25%	60%	32%	22%	17%	3%	4%
30 - 40	29%	27%	35%	20%	32%	28%	42%	26%	29%
40 - 50	32%	35%	35%	20%	16%	28%	25%	37%	43%
50 - 60	17%	27%	35%	20%	16%	28%	17%	31%	25%
61 - ..	5%	6%	5%	-	11%	22%	-	3%	-
<b>Gender</b>									
Female	15%	21%	5%	40%	11%	33%	25%	11%	32%
Male	85%	79%	95%	60%	89%	67%	75%	89%	68%
<b>Education</b>									
Secondary or less	14%	10%	5%	0%	0%	0%	8%	26%	14%
University (Graduate or more)	86%	90%	95%	100%	100%	100%	92%	74%	86%
4th Level (Masters/Phd)	40%	46%	70%	70%	47%	67%	25%	26%	50%
<b>IT Educational</b>									
IT was the main focus of my education	67%	59%	60%	80%	89%	44%	50%	57%	43%
IT was a side subject	23%	28%	25%	20%	5%	33%	42%	29%	39%
IT was not significant in my curriculum	11%	13%	15%	0%	5%	22%	8%	14%	18%
<b>Current professional status</b>									
Full time employee	78%	95%	95%	100%	100%	100%	100%	94%	93%
Part time employee	2%	1%	0%	0%	0%	0%	0%	3%	0%
Self-employed	8%	3%	5%	0%	0%	0%	0%	0%	7%
Student / Unemployed / Retired	12%	1%	0%	0%	0%	0%	0%	3%	0%
<b>Number of employees</b>									
1 - 10	11%	8%	5%	0%	0%	18%	0%	3%	15%
11 - 50	13%	15%	15%	30%	26%	12%	17%	18%	7%
51 - 250	22%	25%	15%	10%	21%	24%	25%	26%	22%
251 - 1000	18%	18%	25%	10%	11%	6%	25%	24%	15%
> 1000	36%	34%	40%	50%	42%	41%	33%	29%	41%
<b>Industry</b>									
Mainly on IT demand side	49%	46%	55%	40%	47%	61%	58%	37%	50%
Mainly on IT supply side	51%	54%	45%	60%	53%	39%	42%	63%	50%
<b>Proximity index</b>									
Min	86.9	87.5	93.0	88.5	88.3	84.4	66.6	91.0	90.5
Max	40	41	67	62	61	53	44	53	64
	100	100	100	100	100	100	100	100	100
<b>Competence index</b>									
A- Plan	24%	27%	44%	22%	29%	18%	13%	23%	34%
B- Build	25%	24%	24%	50%	62%	13%	22%	21%	17%
C- Run	29%	27%	26%	33%	20%	17%	33%	57%	19%
D- Enable	15%	16%	26%	7%	12%	16%	9%	13%	21%
E- Manage	18%	21%	41%	8%	12%	14%	10%	14%	38%
<b>Competence index</b>									
A01 % IS & Business Strategy Alignment	23%	31%	68%	25%	17%	19%	5%	23%	40%
A02 % Service Level Management	20%	23%	30%	14%	14%	13%	18%	26%	26%
A03 % Business Plan Development	18%	22%	56%	11%	16%	15%	9%	10%	43%
A04 % Product or Project Planning	32%	39%	50%	23%	41%	19%	21%	32%	67%
A05 % Architecture Design	31%	34%	54%	27%	44%	30%	15%	28%	27%
A06 % Application Design	29%	30%	23%	57%	68%	20%	10%	25%	23%
A07 % Technology Watching	31%	32%	43%	21%	33%	23%	14%	38%	24%
A08 % Sustainable development	9%	9%	14%	4%	8%	6%	12%	1%	10%
B01 % Design & Development	23%	22%	25%	52%	66%	11%	7%	16%	11%
B02 % Systems Integration	24%	21%	12%	47%	49%	7%	23%	23%	13%
B03 % Testing	22%	23%	12%	43%	48%	14%	33%	20%	16%
B04 % Solution Deployment	25%	23%	16%	43%	68%	6%	24%	24%	10%
B05 % Documentation Production	34%	39%	58%	65%	82%	35%	36%	30%	40%
C01 % User Support	35%	36%	38%	37%	22%	29%	64%	54%	36%
C02 % Change Support	32%	31%	22%	38%	27%	22%	32%	73%	17%
C03 % Service Delivery	21%	18%	21%	20%	13%	12%	15%	48%	5%
C04 % Problem Management	29%	26%	24%	37%	19%	10%	26%	56%	17%
D01 % Information Security Strategy Development	17%	14%	23%	0%	11%	16%	5%	10%	14%
D02 % ICT Quality Strategy Development	18%	17%	31%	11%	16%	9%	4%	19%	18%
D03 % Education & Training Provision	22%	21%	30%	8%	13%	64%	13%	14%	30%
D04 % Purchasing	16%	20%	28%	9%	8%	15%	9%	20%	27%
D05 % Sales Proposal Development	16%	19%	24%	10%	24%	14%	10%	12%	27%
D06 % Channel Management	4%	4%	10%	6%	0%	0%	0%	4%	6%
D07 % Sales Management	5%	5%	6%	0%	4%	2%	0%	4%	10%
D08 % Contract Management	13%	17%	19%	2%	5%	6%	19%	13%	34%
D09 % Personnel Development	22%	23%	33%	16%	15%	34%	25%	19%	21%
D10 % Information & Knowledge Management	20%	20%	50%	10%	23%	18%	8%	18%	25%
E01 % Forecast Development	11%	12%	23%	4%	11%	8%	12%	4%	19%
E02 % Project & Portfolio Management	20%	25%	48%	3%	16%	10%	15%	16%	61%
E03 % Risk Management	16%	23%	38%	6%	22%	12%	11%	19%	52%
E04 % Relationship Management	24%	27%	42%	26%	13%	16%	18%	21%	55%
E05 % Process Improvement	23%	25%	81%	0%	8%	22%	7%	25%	34%
E06 % ICT Quality Management	13%	13%	27%	7%	5%	6%	5%	10%	14%
E07 % Business Change Management	18%	24%	48%	7%	14%	16%	0%	12%	53%
E08 % Information Security Management	14%	15%	28%	8%	6%	14%	11%	10%	14%
E09 % IT Governance	18%	23%	36%	11%	9%	26%	9%	14%	20%

## 9.2 Proximity Profiles – Details

### 9.2.1 Business Analyst

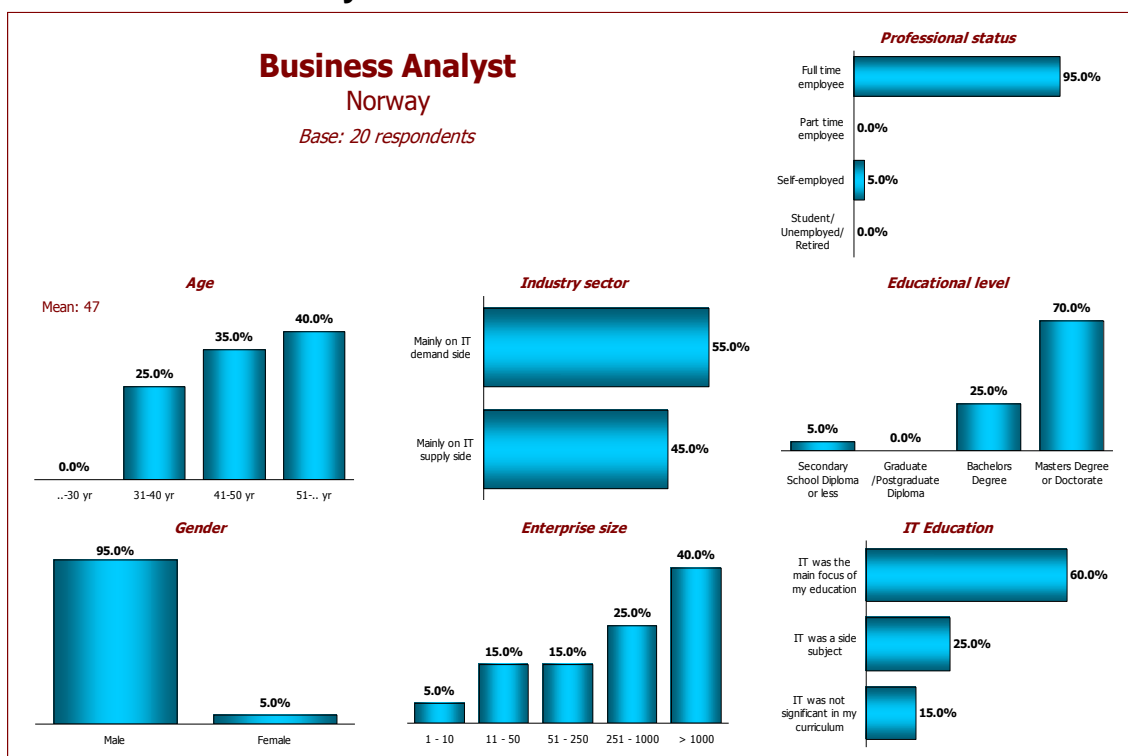


Figure 40 Proximity profile - Business analyst

### 9.2.2 Developer

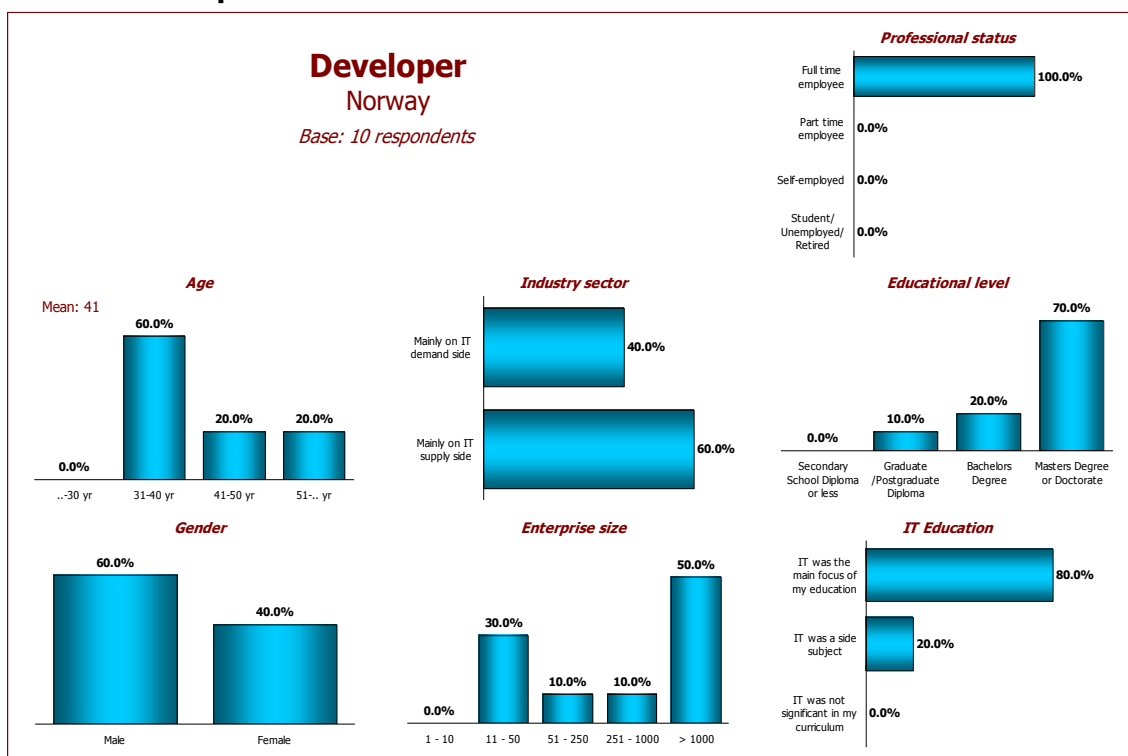


Figure 41 Proximity profile - Developer

### 9.2.3 Digital Media Specialist

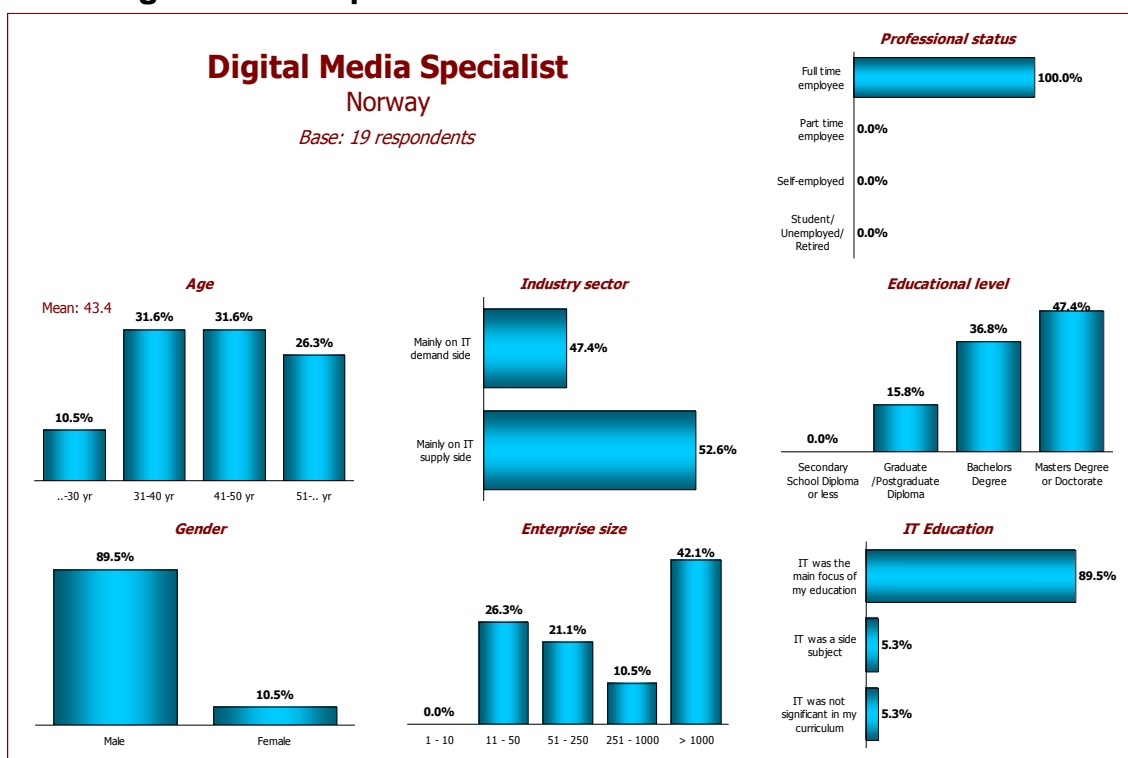


Figure 42 Proximity profile - Digital media specialist

### 9.2.4 ICT Trainer

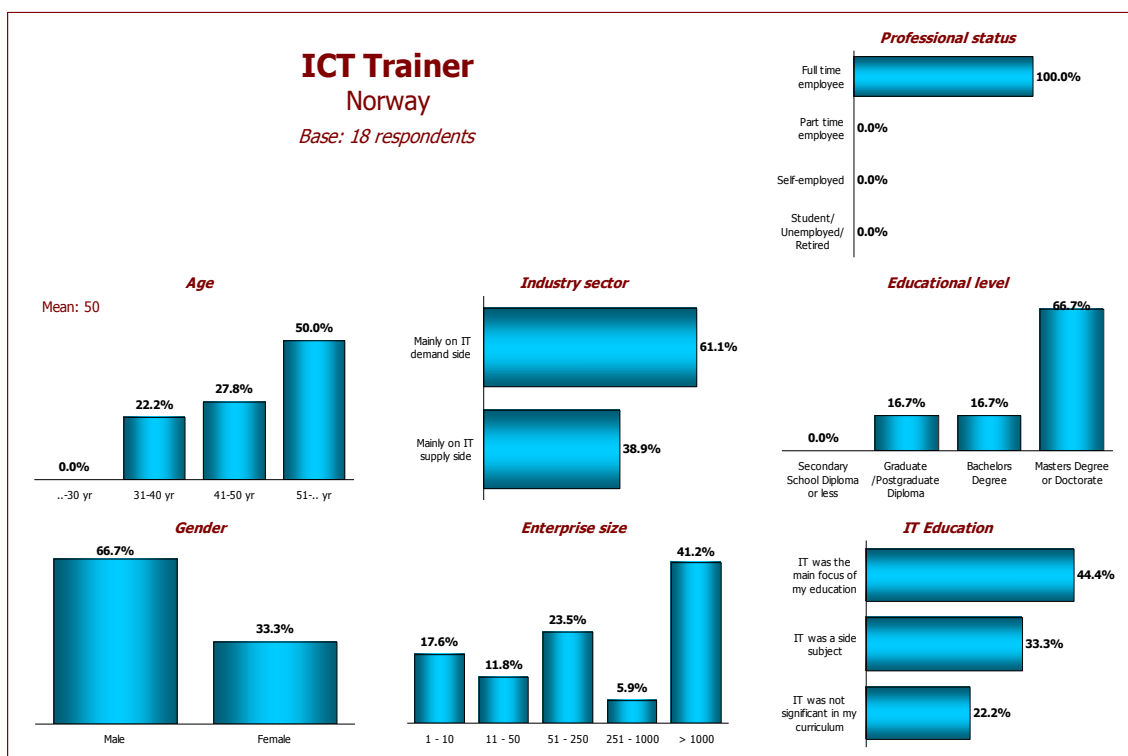


Figure 43 Proximity profile - ICT trainer

## 9.2.5 Systems Administrator

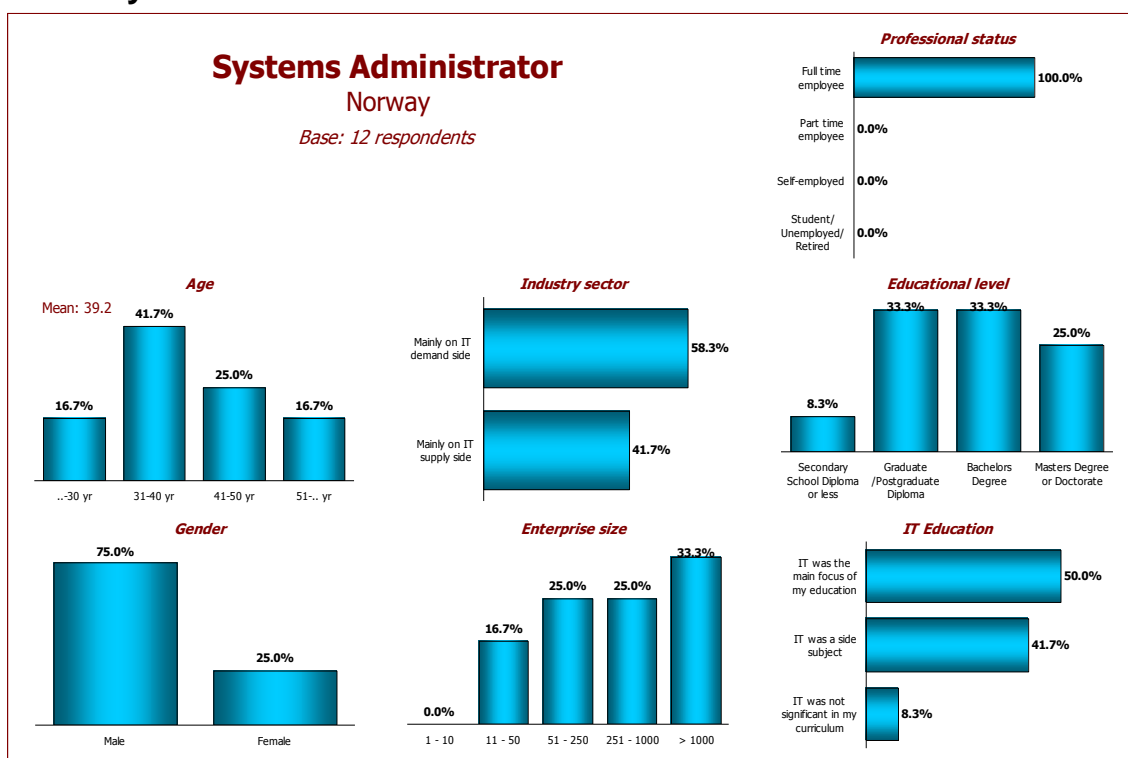


Figure 44 Proximity profile - System administrator

## 9.2.6 Technical Specialist

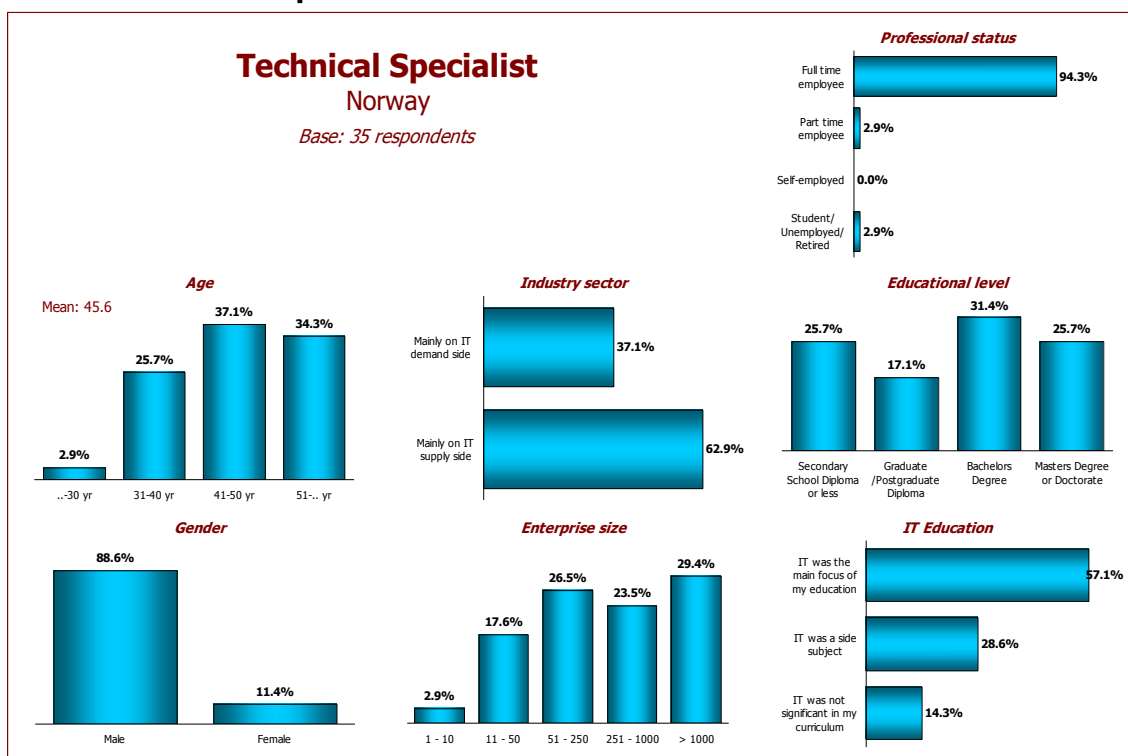


Figure 45 Proximity profile - Technical specialist

## 9.2.7 Project Manager

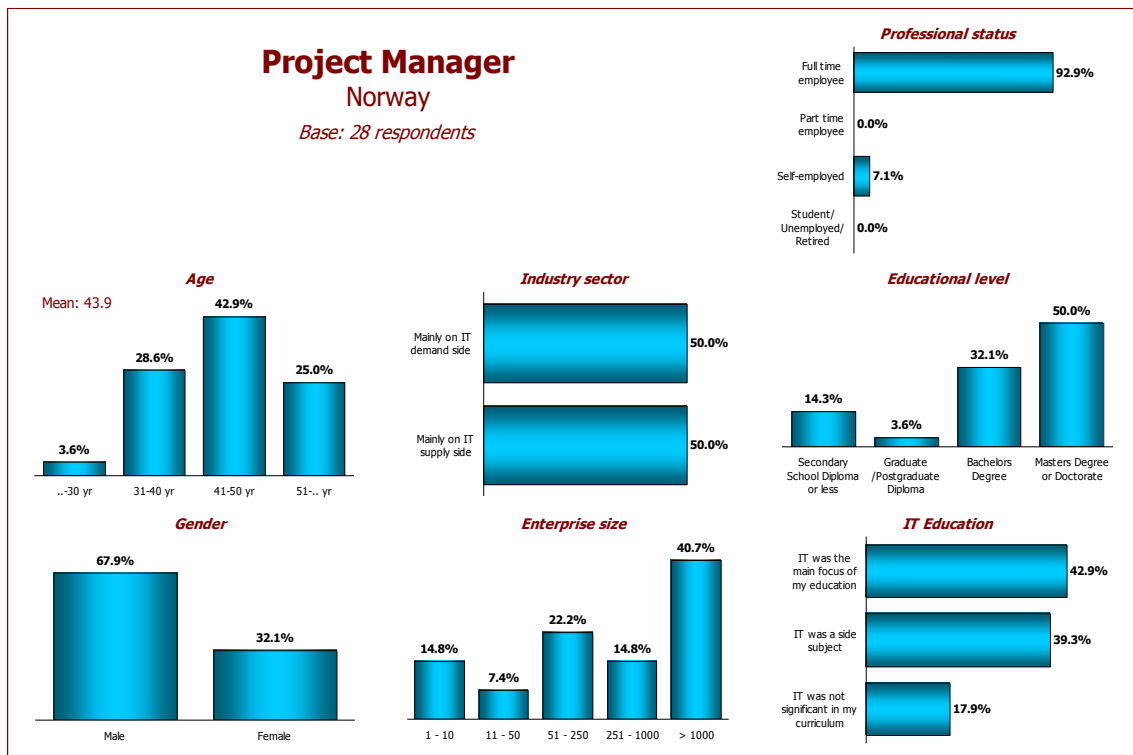


Figure 46 Proximity profile - Project manager