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Women active in the ICT sector

FINAL REPORT

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LIST OF ABBREVIATIONS

APP: Application software

BsC: Bachelor of Science

Bln: Billion

CEO: Chief Executive Officer

CIO: Chief Information Officer

CV: Curriculum Vitae

DG CONNECT: Directorate General for Communications Networks, Content and Technology

DG: Directorate General

EC: European Commission

EMEAR: Europe, Middle East, Africa and Russia

EPO: European Patent Office

EU: European Union

EUR: Euros

EU27: European Union 27 Member States

EWCS: European Working Conditions Surveys

GDP: Gross Domestic Product

GPG: Gender Payment Gap

HR: Human Resources

HRST: Human Resources in Science and Technology

ICT: Information and Communication Technologies

IT: Information Technology

ITIL: Information Technology Infrastructure Library

LAN: Local Area Network

MAN: Metropolitan Area Network

MCSA: Microsoft Certified System Administrator

NGO: Non-Governmental Organisation

OECD: Organisation for Economic Cooperation and Development

PC: Personal Computer

PISA: Programme for International Student Assessment

R&D: Research and Development

RHCT: Red Hat Certified Technician

ROE: Return on Equity

SES: Structure of Earnings Survey

SME: Small and Medium Enterprise

STEM: Science, Technology, Engineering and Mathematics

TAC: Technical Assistance Centre

TV: Television

UK: United Kingdom

UN: United Nations

UNESCO: United Nations Educational, Scientific and Cultural Organisation

UPSTO: United States Patent and Trademark Office

US: United States

WAN: Wide Area Network

DEFINITIONS

- DECIL: statistical term which refers to each of the 10 parts in which a sample or population is divided.
- EQUAL OPPORTUNITY: the absence of barriers to economic, political and social participation on the grounds of sex. Such barriers are often indirect, difficult to discern and caused by structural phenomena and social representations which have proved particularly resistant to change. Equal opportunities, which is founded on the rationale that a whole range of actions are necessary to redress deep-seated sex and gender-based inequities, should be distinguished from equal treatment, which merely implies avoiding direct discrimination (Gender in EU funded research Toolkit[1]).
- EQUALITY BETWEEN WOMEN AND MEN (GENDER EQUALITY): the equal rights, responsibilities and opportunities of women and men and girls and boys. Equality does not mean that women and men will become the same, but that women's and men's rights, responsibilities and opportunities will not depend on whether they are born male or female. Gender equality implies that the interests, needs and priorities of both women and men are taken into consideration, recognising the diversity of different groups of women and men. Gender equality is not a women's issue but should concern and fully engage men as well as women. Equality between women and men is seen both as a human rights issue and as a precondition for, and indicator of, sustainable people-centred development (UN Women[2]).
- GENDER ANALYSIS: the collection and analysis of sex-disaggregated information. Men and women both perform different roles. This leads to women and men having different experience, knowledge, talents and needs. Gender analysis explores these differences so that policies, programmes and projects can identify and meet the different needs of men and women. Gender analysis also facilitates the strategic use of distinct knowledge and skills possessed by women and men (UNESCO[3]).
- GENDER EQUITY: the process of being fair to men and women. To ensure fairness, measures must often be put in place to compensate for the historical and social disadvantages which prevent women and men from operating on a level playing field. Equity is a means. Equality is the result (UNESCO[4]).

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[1] Source: Gender in EU-funded research (2012): *Toolkit and Training.* http://www.yellowwindow.be/genderinresearch/index.html

[2] Source: United Nations Entity for Gender Equality and the Empowerment of Women. http://www.unwomen.org/

[3] Source: UNESCO's Gender Mainstreaming Implementation Framework. http://unesdoc.unesco.org/images/0013/001318/131854e.pdf

[4] Ibid.

- GENDER PAYMENT GAP: the average difference between men's and women's earnings (EUROPEAN COMMISSION[5]).
- GENDER: refers to the social attributes and opportunities associated with being male and female, the relationships between women and men and girls and boys, as well as the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialisation processes. They are context/ time-specific and changeable. Gender determines what is expected, allowed and valued for a women or a man in a given context. In most societies there are differences and inequalities between women and men in terms of assigned responsibilities, activities undertaken, access to and control over resources, as well as decision-making opportunities. Gender is part of the broader socio-cultural context. Other important criteria for socio-cultural analysis include class, race, poverty level, ethnic group and age (UN Women[6]).
- INCDECIL: Statistical variable providing information about income: monthly (take home) pay from main job (in deciles) (EUROSTAT[7]).
- SEX: refers to the biologically determined characteristics of men and women in terms of reproductive organs and functions based on chromosomal complement and physiology. As such, sex is globally understood as the classification of living things as male or female (Gender in EU funded research Toolkit[8]).
- SEX-DISAGGREGATED DATA: data which is collected and presented separately on men and women (UNESCO[9]).
- THIRD SECTOR: civil society and non-profit organisations.

5 Source: European Commission: http://ec.europa.eu/justice/gender-equality/gender-pay-gap/index_en.htm

6 Source: United Nations Entity for Gender Equality and the Empowerment of Women.

7 Source: Eurostat: EU Labour Force Survey database User guide. November 2012

http://circa.europa.eu/irc/dsis/employment/info/data/eu_lfs/LFS_MAIN/LFSuserguide/EULFS_Database_UserGuide_2012.pdf

8 Source: Gender in EU-funded research (2012): Toolkit and Training. http://www.yellowwindow.be/genderinresearch/index.html

9 Source: UNESCO (2003): UNESCO's Gender Mainstreaming Implementation Framework. http://unesdoc.unesco.org/images/0013/001318/131854e.pdf

ABSTRACT

Despite strong evidence regarding the importance of fully incorporating women into the Information and Communication Technologies (ICT) sector, a gender ICT gap still remains in Europe. European females do not take ICT studies. Moreover, women are underrepresented in the sector, particularly in technical and decision-making positions.

Women's active participation in the ICT sector is essential for Europe's long-term growth and economic sustainability. The study *Women Active in the ICT Sector* is another step in the on-going efforts[10] to tackle the problem. This is achieved by: (1) updating current data regarding females' roles in the sector; (2) identifying role models and career paths to inspire women and girls; (3) assessing the economic impact of incorporating women into the sector; (4) reviewing the status of the European Code of Best Practices for Women and ICT; and (5) analysing successful social media campaigns.

The conclusions of this study provide useful insights, which it is hoped will help to attract women to, and encourage them to remain in, the ICT sector. Based on these insights several recommendations are proposed: (1) build a renewed image of the sector; (2) empower women in the sector; (3) increase the number of women entrepreneurs in the ICT sector and (4) improve working conditions in the sector.

[10] Some previous studies include:

- European Commission (2006): Best practices for even gender distribution in the 25 member states in the domain of Information Society. Brussels.
- European Commission (2010): Women and ICT Status Report 2009. Brussels.
- European Commission (2009): Code of Best Practices for Women and ICT. http://ec.europa.eu/digital-agenda/en/news/code-best-practices-women-ictEuropean Commission (2013): She Figures 2012. Gender in Research and Innovation. Publications Office of the European Union. Luxembourg.

ABRÉGÉ

Tout concorde à montrer à quel point il est important d'intégrer pleinement les femmes dans le secteur des technologies de l'information et des communications (TIC). En Europe, il subsiste pourtant un fossé entre les hommes et les femmes dans le domaine des TIC, dont les Européennes se désintéressent lors de leurs études. De plus, les femmes sont sous-représentées dans ce secteur, particulièrement dans les métiers techniques et les postes à responsabilités.

La participation active des femmes dans le secteur des TIC est indispensable à l'Europe pour assurer sa croissance à long terme et la pérennité de son économie. L'étude *Women Active in the ICT Sector* («femmes actives dans le secteur des TIC») s'inscrit dans la continuité des efforts déployés [11] pour résoudre ce problème. Les travaux réalisés ont consisté à: 1) mettre à jour les données actuelles sur le rôle des femmes dans le secteur; 2) définir des modèles à suivre et des parcours professionnels susceptibles d'intéresser les femmes et les jeunes filles; 3) analyser les incidences économiques de l'intégration des femmes dans le secteur; 4) revaloriser le code européen des bonnes pratiques en faveur des femmes dans le secteur des TIC; 5) analyser des campagnes menées avec succès par l'intermédiaire des médias sociaux.

Les conclusions de la présente étude fournissent des indications utiles, dont on peut espérer qu'elles permettront d'attirer les femmes vers le secteur des TIC et de les inciter à y rester. Sur la base de ces indications, plusieurs recommandations sont proposées: 1) renouveler l'image du secteur; 2) donner plus de responsabilités aux femmes dans le secteur; 3) augmenter le nombre de dirigeantes d'entreprise dans le secteur des TIC; 4) améliorer les conditions de travail dans le secteur.

[11] Quelques études antérieures:

Commission européenne (2006): *Best practices for even gender distribution in the 25 member states in the domain of Information Society* («meilleures pratiques en matière d'équilibre entre les femmes et les hommes dans les 25 États membres dans le domaine de la société de l'information»). Bruxelles.

Commission européenne (2010): *Women and ICT Status Report 2009* («les femmes et les TIC: rapport sur l'évolution de la situation 2009»). Bruxelles.

Commission européenne (2009): Code des bonnes pratiques en faveur des femmes dans le secteur des TIC. http://ec.europa.eu/digital-agenda/en/news/code-best-practices-women-ict

Commission européenne (2013): *She Figures 2012*. *Gender in Research and Innovation* («égalité femmes-hommes dans la recherche et l'innovation»). Office des publications de l'Union européenne, Luxembourg.

EXECUTIVE SUMMARY

Context and methodology

Despite the evidence which proves that women's access to an ICT career is essential for the sector's long-term growth and the sustainability of the European economy, there remains a large gender gap in Europe's ICT sector. This study uses desk research, statistical analysis and economic cases as well as stakeholder interviews and surveys to analyse the problem and come up with key priorities for action.

Problem

Several problems prevent women from fully participating in the ICT sector:

1. **Cultural traditions and stereotypes** about women's role in society and about the sector.
2. **Internal barriers, socio-psychological factors pulling back women from the sector and its top positions:** lack of self-confidence, lack of bargaining skills, risk-aversion and negative attitudes towards competition.
3. **External barriers, ICT sector features strengthening the gender gap:** strongly male dominated environment, complex reconciliation between personal and professional life, and lack of role models in the sector.

Main findings

Women are still underrepresented in the ICT sector. Out of 1,000 women with a bachelor degree in Europe, only 29 hold a degree in ICT (compared to 95 men) whilst only 4 eventually work in the ICT sector. To compound the problem, women leave the sector mid-career (leaky pipeline) to a greater extent than men. Indeed, 20% of women aged 30 years with ICT-related bachelor degrees work in the sector, whilst only 9% of women above 45 years old with these degrees do so[12].

Women are also particularly underrepresented in managerial and decision-making positions. Although this is a general problem, the percentage of female bosses in ICT is much smaller than in other sectors: 19.2% of ICT sector workers compared to 45.2% of non-ICT sector workers have female bosses[13].

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[12] Data elaborated in house (Economic case 2) based on the European Labour Force Survey 2011. ICT refers to J sector. Microdata necessary for this study is not available for Cyprus and the Czech Republic, therefore 25 countries from EU27 have been included, together with Switzerland, making 26 in total.

[13] Data elaborated in-house based on Survey on Working Conditions (2010). Countries included in the survey are: EU27, Norway, Croatia, the Former Yugoslav Republic of Macedonia, Turkey, Albania, Montenegro and Kosovo* (*This designation is without prejudice to positions on status, and is in line with UNSCR1244 and the ICJ Opinion on the Kosovo Declaration of Independence). For consistency our analysis does not include Turkey, meaning that 33 countries are considered. The ICT sector refers to the NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1)., Under the non-ICT Service Sector we include the following sectoral activities: K (Financial and insurance activities), L (Real

Meanwhile economic arguments for increased female participation in the sector abound. If women held digital jobs as frequently as men, **the gain for the European GDP each year would be around 9 bn EUR (this translates into 1.3 times Malta's GDP!)**[14]. The industry itself would profit from more balanced participation rates: **organisations that are more inclusive of women in management achieve 35% higher ROE and 34% better total return to shareholders** than other comparable organisations[15].

Women themselves can profit from this career choice by earning higher salaries: **females in the ICT sector earn almost 9% more than women in similar positions** in the non-ICT service sectors[16]. They enjoy higher flexibility to arrange their working schedules and will be less susceptible to unemployment: there will be 900.000 unfilled ICT positions in the European Union by 2015[17].

Our study also suggests that in the ICT sector the Gender Payment Gap (GPG) is less significant. Even though the unadjusted GPG (which compares average salaries between men and women) is higher than in other sectors (21% compared to an average of 16%[18]), the adjusted GPG (which compares women and men with similar socio-economic characteristics) is close to 0%, while it stands at 5% in the non-ICT service sectors[19]. The fact that the adjusted gap drops to zero, whereas the unadjusted one amounts to 21%, is due to a tendency for most women in the ICT sector to work in lower positions with smaller wages.

Key priorities for action:

Priority 1. Build a renewed image of the sector among women and mainstream society

Young women usually see jobs in the ICT sector as solitary, boring and useless in terms of helping others. They prefer working with people on tasks

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estate activities), M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N (Administrative and support service activities), O (Public administration and defence), P (Education), Q (Human health and social work activities) and S (Other service activities).

[14] Data elaborated for this study based on the European Labour Force Survey (2011). For a detailed description of the methodology used please refer to the section "Description of the Problem" of this document.

[15] Source: Padnos, C. (2010)

[16] Data elaborated for this study based on the European survey on Working Conditions (2010). For a detail description of the methodology used please refer to Annex II, Economic Case 2.

[17] http://europa.eu/rapid/press-release_IP-13-182_en.htm

[18] Source: Eurostat
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Gender_pay_gap_statistics

[19] Data elaborated for this study based on the Survey on Working Conditions (2010). For a detailed description of the methodology used please refer to the section "Description of the Problem" of this document.

involving strong human relationships. Current stereotypes relating to the sector include: long working hours, a largely male-dominated environment, and difficulties in balancing personal and professional life[20].

To guarantee a comprehensive approach a double perspective should be applied by disseminating both the creative side of technologies and their enabling role.

Top recommendations:

1. Disseminate the most appealing aspects of ICT for young people, and particularly for women such as: exciting, diverse, challenging, full of opportunities and profitable. Create role models through visibility of key women in the sector.
2. Disseminate evidence of equal capabilities of women for STEM studies.
3. Promote a "diversity" approach and use integrating terms to encourage girls to take up an ICT-related career and further involve men in the solution.

Priority 2. Empower women in the sector

Certain psychological and socio-psychological factors have important effects on the labour market outcome, particularly in very male-dominated sectors such as ICT. These factors include gender differences in risk preferences, attitudes towards competition, strengthening other-regarding preferences, and attitudes towards negotiation.

Those differences have a significant impact on gender gaps in the ICT sector and are partially explained by lack of confidence of women in their own capabilities as well as a cultural and social environment which is still dominated by strong preconceptions regarding appropriate jobs for men and women.

Top recommendations:

1. Promote harmonised European educational curricula (working closely with the industry) to foster clear and straightforward ICT careers paths, particularly in innovative and young sectors while encouraging informal and lifelong ICT learning.
3. Improve the confidence of women in their managerial capabilities through training and coaching programmes and promote mentoring programmes within companies.
4. Showcase inventions, developments and innovations coming from women: more visibility for tangible products or services by women.

[20] Sources: Gras-Velazquez, A., Joyce, A. & Debry, M. (2009). Other sources that refer to these stereotypes are: European Commission (2006) *and* Valenduc, G., Vendramin, P., Guffens, C., Ponzellini, A., Lebano, A., D'Ouville, L., Collet, I., Wagner, I., Birbaumer, A., Tolar, M. & Webster, J. (2004)

Priority 3. Increase the number of women entrepreneurs in the ICT sector

The number of female entrepreneurs in the ICT sector is low compared to other sectors. Women constitute 53.9% of entrepreneurs in non-ICT sectors and 31.1% of all European self/employed while accounting for a mere 19.2% of ICT entrepreneurs[21]. Promoting entrepreneurship in Europe, both among men and women, is critical for the European economy.

Top recommendations:

1. Improve access to funding for women entrepreneurs, particularly seed and venture capital programmes.
2. Promote the idea of entrepreneurship in the ICT sector as easier than in other sectors: programming can be done from a PC anywhere and requires low initial investment! Use role models as examples.

Priority 4. Improve working conditions in the sector

There are two main problems in the sector which affect the working conditions of women: the persistence of certain informal rules in the sector (the so called “old-boys' network system”), and working conditions (working hours and schedules). That said, maternity remains the turning point of women’s careers in this sector as well.

Top recommendations:

1. Communication campaigns should disseminate existing economic data relating to the improved performance of companies with women (and a diverse workforce) and the foreseeable lack of qualified ICT workers in the future. Indeed, this reinforces the idea that women have the same capabilities as men.
2. Companies should “speak female language”: to become more attractive to women, they must focus their offer on the aspects which women value the most (balancing work and family life, personal fulfilment, etc.).
3. Reform the Code of Best Practices for Women and ICT in the shape of an "ICT diverse workforce" label.

Transversal action 1. Improve data availability

Despite large amounts of data being available, obtaining a complete overview of European Women in the ICT sector is hindered by lack of data sources broken down by gender.

This issue is particularly worrying in the case of women researchers in the sector (number of patents, number of women head of departments in

[21] Data elaborated for this study from the Survey on Working Conditions 2010. ICT sector refers to the NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1). Under the non-ICT Service Sector we include the following sectoral activities: K, L, M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N, O, P, Q and S.

universities), female ICT entrepreneurs and women in managerial positions in ICT companies. Indeed, this can lead to underlying problems not being brought to the table, and thus persisting.

Top recommendations:

1. Improve both the availability and the visibility of data.
2. Encourage data gathering by intermediaries such as recruiting companies to improve "objective" data on recruiting policies, GPG, etc.

Transversal action 2: Identify and Exchange Best Practices

Top recommendations:

1. Support existing initiatives whilst also providing visibility and support to the most successful ones or scaling them up.
2. A mechanism for the more effective exchange of scalable and replicable best practices should be implemented. Becoming a best practice in Europe should be truly attractive for all industry organisations, and therefore rewards should be put in place and visibility ensured.
3. Dissemination activities should not exclusively target women; men should be involved in all actions. The increase of participation of women in general activities of the industry (congresses, events, workshops, etc.) should be preferred over the organisation of specific events only for women.

Table 1. Suggested priorities and transversal actions

Priorities	1. Build a renewed image of the sector among women and mainstream society
	2. Empower women in the sector
	3. Increase the number of women entrepreneurs in the ICT sector
	4. Improve working conditions in the sector
Transversal actions	1. Improve data availability
	2. Identify and exchange best practices

Source: prepared in house

The annexes of the report include additional recommendations as well as the detailed description of the economic cases and further information on the research carried out.

For privacy reasons all interviews and surveys have been kept anonymous.

RÉSUMÉ

Contexte et méthodologie

Bien qu'il soit démontré que l'accès des femmes à une carrière dans les TIC est essentiel pour la croissance du secteur à long terme et la viabilité de l'économie européenne, il subsiste un écart important entre les femmes et les hommes dans ce secteur en Europe. La présente étude s'appuie sur des recherches documentaires, des analyses statistiques et des scénarios économiques, ainsi que sur des entretiens avec les acteurs concernés et sur des enquêtes en vue d'analyser le problème et de proposer de grandes priorités d'action.

Problème

Plusieurs problèmes empêchent les femmes de participer pleinement au secteur des TIC:

4. **les traditions culturelles et les stéréotypes** sur le rôle des femmes dans la société et sur le secteur des TIC;
5. **des entraves intérieures et des facteurs socio-psychologiques qui maintiennent les femmes à l'écart du secteur des TIC et de ses postes-clés:** manque d'assurance, manque d'aptitude à la négociation, aversion à l'égard du risque et attitudes négatives à l'égard de la concurrence;
6. **des entraves extérieures et des particularités propres au secteur des TIC qui creusent le fossé entre les hommes et les femmes:** environnement à forte dominante masculine, difficulté de concilier vie privée et vie professionnelle, manque de modèles à suivre dans le secteur.

Principales conclusions

Les femmes restent sous-représentées dans le secteur des TIC. Pour 1 000 femmes titulaires d'un diplôme de l'enseignement supérieur en Europe, seules 29 possèdent un diplôme dans le domaine des TIC (contre 95 hommes), dont 4 seulement seront amenées à travailler dans le secteur des TIC. Le problème est aggravé par le fait que les femmes quittent davantage que les hommes ce secteur en milieu de carrière (phénomène dit du «tuyau percé»). En effet, 20 % des femmes de 30 ans titulaires d'un diplôme de l'enseignement supérieur lié aux TIC travaillent dans ce secteur, contre 9 % seulement des femmes de plus de 45 ans possédant les mêmes qualifications[22].

[22] Données préparées en interne (Scénario économique 2) sur la base de l'enquête européenne sur les forces de travail 2011. Les TIC correspondent au secteur J. Chypre et la République tchèque ne

Les femmes sont également particulièrement sous-représentées aux postes d'encadrement et de décision. Même s'il s'agit d'un problème général, le pourcentage de femmes chefs dans le secteur des TIC est largement inférieur à ce qu'il est dans d'autres secteurs: 19,2 % des travailleurs du secteur des TIC ont pour chef une femme, contre 45,2 % des travailleurs d'autres secteurs[23].

Or les arguments économiques en faveur d'une présence accrue des femmes dans ce secteur sont légion. Si les femmes occupaient autant d'emplois que les hommes dans le numérique, **il s'ensuivrait un gain d'environ 9 milliards d'euros par an pour le PIB européen (soit 1,3 fois le PIB de Malte!)**[24]. Les entreprises elles-mêmes tireraient profit d'une répartition plus équilibrée: **les organisations dont l'effectif compte davantage de femmes aux postes d'encadrement affichent un RCP supérieur de 35 % et une rentabilité totale pour l'actionnaire supérieure de 34 %** aux autres organisations de nature comparable[25].

Quant aux femmes elles-mêmes, ce choix de carrière leur promet des salaires plus élevés: **dans le secteur des TIC, les femmes gagnent près de 9 % de plus que les femmes occupant des postes comparables** dans les secteurs de services autres que les TIC[26]. Elles jouissent d'une plus grande souplesse pour aménager leurs plages de travail et sont moins exposées au risque de chômage: dans le secteur des TIC de l'Union européenne, 900 000 postes deviendront vacants d'ici à 2015[27].

Notre étude tend également à indiquer que, dans le secteur des TIC, l'écart de rémunération entre les hommes et les femmes (ERHF) est moins important. Bien que l'ERHF non corrigé (comparaison du salaire moyen des hommes et des femmes) soit plus élevé que dans d'autres secteurs (21 %

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disposant pas des microdonnées nécessaires à cette étude, 25 pays de l'UE-27 ont été pris en compte, ainsi que la Suisse, soit 26 pays au total.

[23] Données préparées en interne sur la base de l'enquête sur les conditions de travail (2010). Pays couverts par l'enquête: UE-27, Norvège, Croatie, ancienne République yougoslave de Macédoine, Turquie, Albanie, Monténégro et Kosovo. Notre analyse ne tenant pas compte de la Turquie. 33 pays sont concernés. Le secteur des TIC correspond aux sections suivantes de la NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J et M (71.12, 71.2, 72.1). En ce qui concerne les services autres que les TIC, les secteurs suivants ont été pris en compte: K (activités financières et d'assurance), L (activités immobilières), M (activités spécialisées, scientifiques et techniques, à l'exception des divisions 71 et 72, qui sont dans le secteur des TIC), N (activités de services administratifs et de soutien), O (administration publique et défense), P (enseignement), Q (santé humaine et action sociale) et S (autres activités de services).

[24] Données préparées aux fins de la présente étude sur la base de l'enquête européenne sur les forces de travail (2011). Pour une description détaillée de la méthodologie utilisée, consulter la section «Description du problème».

[25] Source: Padnos, C. (2010).

[26] Données préparées pour la présente étude sur la base de l'enquête européenne sur les conditions de travail (2010). Pour une description détaillée de la méthodologie utilisée, il convient de se référer à l'annexe II, scénario économique 2.

[27] http://europa.eu/rapid/press-release_IP-13-182_fr.htm

contre une moyenne de 16 %[28]), l'ERHF corrigé (comparaison entre des femmes et des hommes présentant des caractéristiques socio-économiques semblables) est proche de 0 %, alors qu'il est de 5 % dans les secteurs de services autres que les TIC[29]. La différence entre l'écart corrigé (0 %) et l'écart non corrigé (21 %) s'explique par le fait que, dans le secteur des TIC, la plupart des femmes tendent à occuper des postes subordonnés auxquels sont associés des salaires inférieurs.

Grandes priorités d'action

Priorité 1 - Renouveler l'image du secteur auprès des femmes et de la société

Les jeunes femmes perçoivent généralement les emplois dans le secteur des TIC comme solitaires, ennuyeux et inutiles pour aider les autres. Elles préfèrent travailler avec des collègues à des tâches impliquant des relations humaines étroites. Parmi les stéréotypes actuels concernant le secteur, on peut citer les longues journées de travail, un environnement à forte dominante masculine et la difficulté de concilier vie privée et vie professionnelle[30].

Pour embrasser l'ensemble de la problématique, il convient d'adopter un double point de vue en promouvant à la fois l'aspect créatif des technologies et leur rôle catalyseur.

Recommandations clés

1. Promouvoir les côtés les plus attrayants du secteur des TIC pour les jeunes, en particulier pour les femmes: il est stimulant, diversifié, exigeant, riche en perspectives et lucratif. Offrir des modèles à suivre en mettant en avant des femmes qui jouent un rôle important dans le secteur.
2. Assurer la diffusion de données montrant que les femmes présentent les mêmes aptitudes que les hommes pour les disciplines relatives aux «STEM».
3. Promouvoir une attitude de «diversité» et utiliser des termes intégrateurs pour encourager les jeunes filles à se lancer dans une carrière dans le domaine des TIC et impliquer davantage les hommes dans la résolution du problème.

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[28] Source: Eurostat http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/gender_pay_gap_statistics

[29] Données préparées pour la présente étude sur la base de l'enquête sur les conditions de travail (2010). Pour une description détaillée de la méthodologie utilisée, consulter la section «Description du problème».

[30] Sources: Gras-Velazquez, A., Joyce, A. & Debry, M. (2009). Autres sources évoquant ces stéréotypes: Commission européenne (2006) *et* Valenduc, G., Vendramin, P., Guffens, C., Ponzellini, A., Lebano, A., D'Ouville, L., Collet, I., Wagner, I., Birbaumer, A., Tolar, M. & Webster, J. (2004).

Priorité 2 - Donner plus de responsabilités aux femmes dans le secteur

Certains facteurs psychologiques et socio-psychologiques ont des effets importants sur le fonctionnement du marché du travail, surtout dans les secteurs à forte dominante masculine, tels que les TIC. Ces facteurs comprennent les différences entre hommes et femmes en matière de goût du risque, d'attitude à l'égard de la concurrence, de relations humaines et d'attitude envers la négociation.

Ces différences ont une incidence significative sur les disparités hommes-femmes dans le secteur des TIC et s'expliquent en partie par le manque de confiance des femmes dans leurs propres capacités ainsi que par un environnement culturel et social qui reste sous l'emprise de forts préjugés concernant les emplois qui conviennent aux hommes et aux femmes.

Recommandations clés

2. Promouvoir des programmes d'enseignement européens harmonisés (en étroite collaboration avec les entreprises), afin de favoriser les évolutions de carrière claires et simples dans les TIC, notamment dans les secteurs innovants et jeunes, tout en encourageant leur apprentissage en dehors des structures et tout au long de la vie.
2. Améliorer la confiance des femmes dans leurs capacités de gestion par des programmes de formation et d'accompagnement et promouvoir les programmes de parrainage au sein des entreprises.
3. Mettre en valeur les inventions, innovations et développements dus à des femmes: donner plus de visibilité à des produits ou services concrets mis au point grâce à des femmes.

Priorité 3 - Augmenter le nombre de dirigeantes d'entreprise dans le secteur des TIC

Le nombre de femmes chefs d'entreprise dans le secteur des TIC est faible par rapport à d'autres secteurs. Les femmes représentent 53,9 % des chefs d'entreprise dans les secteurs autres que les TIC et 31,1 % des travailleurs indépendants en Europe, mais ne représentent que 19,2 % du patronat dans le secteur des TIC[31]. Il est primordial pour l'économie européenne de promouvoir l'entrepreneuriat en Europe, tant chez les hommes que chez les femmes.

Recommandations clés

[31] Données préparées pour la présente étude sur la base de l'enquête sur les conditions de travail 2010. Le secteur des TIC correspond aux sections suivantes de la NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J et M (71.12, 71.2, 72.1). Les services autres que les TIC comprennent les secteurs suivants: K, L, M (activités spécialisées, scientifiques et techniques, à l'exception des divisions 71 et 72, qui appartiennent au secteur des TIC), N, O, P, Q et S.

3. Améliorer l'accès au financement pour les femmes chefs d'entreprise, surtout en ce qui concerne les programmes «capital d'amorçage et capital-risque».

4. Promouvoir l'idée que la création d'entreprise dans le secteur des TIC est plus facile que dans d'autres secteurs: la programmation peut être faite n'importe où à partir d'un ordinateur individuel et pour un faible investissement initial! Utiliser des modèles à suivre.

Priorité 4 - Améliorer les conditions de travail dans le secteur

Le secteur est confronté à deux grands problèmes qui ont une incidence sur les conditions de travail des femmes: la persistance de certaines règles informelles dans le secteur (le «réseau de vieux amis» et les conditions de travail (plages de travail et horaires). Cela dit, dans ce secteur également, la maternité reste le point sensible de la carrière des femmes.

Recommandations clés:

4. Campagnes de communication visant à diffuser les données économiques existantes démontrant l'amélioration des performances des entreprises qui emploient des femmes (et une main-d'œuvre diversifiée) et la pénurie prévisible de personnel qualifié dans les TIC. Il en ressortira d'autant mieux que les femmes ont les mêmes capacités que les hommes.

5. Les entreprises devraient «parler le langage des femmes»: pour attirer davantage les femmes, elles doivent mettre en avant les aspects auxquels les femmes accordent le plus de valeur (conciliation vie privée-vie professionnelle, épanouissement personnel, etc.).

6. Remanier le code des bonnes pratiques en faveur des femmes dans le secteur des TIC en lui donnant la forme d'un label «diversité des effectifs dans les TIC».

Action transversale 1 - Améliorer la disponibilité des données

En dépit de grandes quantités de données étant disponibles, l'obtention d'une vue d'ensemble complète de la situation des Européennes dans le secteur des TIC est empêchée par le manque de sources de données ventilées par sexe.

Ce problème est particulièrement préoccupant dans le cas des femmes chercheurs dans le secteur des TIC (nombre de brevets, nombre de femmes chefs de service dans les universités), du patronat féminin dans les TIC et des femmes occupant des postes d'encadrement dans les entreprises du secteur des TIC. Ce phénomène pourrait même masquer des problèmes sous-jacents et, partant, persistants.

Recommandations clés

3. Améliorer la disponibilité et la visibilité des données.

4. Encourager la collecte de données par les intermédiaires, tels que les entreprises de recrutement, pour améliorer la collecte de données «objectives» sur les politiques de recrutement, l'ERHF, etc.

Action transversale 2 - Recenser et échanger les meilleures pratiques

Recommandations clés

4. Soutenir les initiatives existantes tout en assurant la visibilité des initiatives les plus réussies, en les soutenant ou en les portant à une échelle supérieure.
5. Un mécanisme devrait être mis en œuvre pour assurer un échange plus efficace de meilleures pratiques évolutives et reproductibles. Le statut de meilleure pratique en Europe devrait être véritablement attrayant pour toutes les organisations sectorielles, de sorte que des récompenses devraient être mises en place et que leur visibilité devrait être assurée.
6. Les activités de diffusion ne devraient pas cibler exclusivement les femmes; les hommes devraient être associés à toutes les actions. L'augmentation de la participation des femmes dans les activités générales du secteur (congrès, événements, ateliers, etc.) est préférable à l'organisation d'événements spécifiques s'adressant uniquement aux femmes.

Tableau 1 - Suggestions de priorités et d'actions transversales

Priorités	1. Renouveler l'image du secteur auprès des femmes et de la société
	2. Donner plus de responsabilités aux femmes dans le secteur
	3. Augmenter le nombre de dirigeantes d'entreprise dans le secteur des TIC
	4. Améliorer les conditions de travail dans le secteur
Actions transversales	1. Améliorer la disponibilité des données
	2. Recenser et échanger les meilleures pratiques

Source: préparé en interne

Les annexes du rapport comprennent des recommandations supplémentaires ainsi qu'une description détaillée des scénarios économiques et de plus amples informations sur les recherches réalisées.

Dans un souci de respect de la vie privée, l'anonymat de tous les entretiens et enquêtes a été assuré.

OBJECTIVES

Despite the vast amount of evidence which proves that women's access to an ICT career is essential for the sector's long-term growth and the sustainability of our economy, and that companies with higher percentages of women on corporate boards perform better[32] (increased innovation and productivity and higher overall corporate performance), there remains a large gender gap in Europe's ICT sector.

The global situation is clearly summarised by the Information and Telecommunications sector in the European Code of Best Practices for Women and ICT[33]:

- The number of young people who choose ICT careers is decreasing, although demand continues to grow, thus meaning that a skills gap in the sector is expected.
- The impact of ICT on the economy is such that this factor could threaten Europe's economic growth in the following years.
- Women are under-represented at all levels in the ICT sector but especially in decision-making positions.
- Getting women to enter and remain in the sector is essential when it comes to filling this gap.

The STUDY ON WOMEN ACTIVE IN THE ICT SECTOR aims to provide evidence in support of further efforts to attract women to the sector and retain female talent. The concrete objectives of the study are:

- To update existing data on the situation of women in the sector in Europe and identify data gaps.
- To identify role models and career paths to inspire women and girls.
- To elaborate on economic arguments supporting the importance of incorporating women into the sector: for the industry, for women and for the whole economy.
- To review the current situation of the European Code of Best Practices for Women and ICT.
- To analyse successful social media campaigns which can be applicable to the objectives of the Commission regarding women in ICT.
- To elaborate on recommendations addressing the various stakeholders: the European Union, national/regional governments, the industry and the third sector.

[32] Source: European Commission (2012): *Progress in gender equality leads to economic growth* http://ec.europa.eu/justice/newsroom/gender-equality/news/20120416_en.htm

[33] European Commission (2009)

SCOPE AND METHODOLOGY

Scope of the study

For the purpose of this study, **Information and Communication Technologies (ICT) are defined** in a wide manner as the technological tools, services and products which allow us to exchange information and communicate. We include in this definition telecommunications, computers, Internet in a broad sense and also the media and digital contents sector.

It is important to take into account the far-reaching impact which ICT has on the whole economy and its close relation with most of today's activities: commerce, distribution, logistics, education, etc. Among the positions and cases which will be analysed some may not be strictly considered as technical careers due to the fact that bloggers, community managers or policy makers, and persons interviewed may lack formal ICT education. With this said, these are nonetheless included in our study to respond to this broad aspect of ICT and the Internet, as well as to illustrate the extensive impact of the sector.

For the elaboration of the economic cases only the ICT business sector has been included (ICT activities performed by the public sector, like regulation, or the non for profit sector have been excluded).

In general, in the study the ICT sector refers to the NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1):

SECTION C — MANUFACTURING
26 Manufacture of computer, electronic and optical products
26.1 Manufacture of electronic components and boards
26.2 Manufacture of computers and peripheral equipment
26.3 Manufacture of communication equipment
26.4 Manufacture of consumer electronics
SECTION G — WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES
46 Wholesale trade, except of motor vehicles and motorcycles
46.5 Wholesale of information and communication equipment
47 Retail trade, except of motor vehicles and motorcycles
47.4 Retail sale of information and communication equipment in specialised stores
SECTION J — INFORMATION AND COMMUNICATION
58 Publishing activities
58.1 Publishing of books, periodicals and other publishing

activities
58.2 Software publishing
59 Motion picture, video and television programme production, sound recording and music publishing activities
59.1 Motion picture, video and television programme activities
59.2 Sound recording and music publishing activities
60 Programming and broadcasting activities
60.1 Radio broadcasting
60.2 Television programming and broadcasting activities
61 Telecommunications
61.1 Wired telecommunications activities
61.2 Wireless telecommunications activities
61.3 Satellite telecommunications activities
61.9 Other telecommunications activities
62 Computer programming, consultancy and related activities
62.0 Computer programming, consultancy and related activities
63 Information service activities
63.1 Data processing, hosting and related activities; web portals
63.9 Other information service activities
SECTION M — PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES
71 Architectural and engineering activities; technical testing and analysis
71.12 Engineering activities and related technical consultancy
71.2 Technical testing and analysis
72 Scientific research and development
72.1 Research and experimental development on natural sciences and engineering

However, for certain analyses, particularly those based on the Labour Force Survey, ICT includes only the J sector (Information and Communication) due to limited availability of data by sub-sections. Further details on the methodology used for each economic case is included in Annex II.

In short, the study will analyse the situation of women in the ICT sector understood as the group of the **computer, telecommunications, communication equipment, Internet related activities and media and digital content sub-sectors**. The jobs which will be part of the

analysis include **manufacturers, engineers, technicians, consultants, developers, designers, traders, researchers and marketing and communication professionals within those sub-sectors**.

Methodology

The selected methodology for this study is a combination of qualitative and quantitative techniques and a combination of primary and secondary sources. In brief, the research methodologies used to carry out this study include:

- **Desk research**, including the review of databases and academic literature, the analysis of existing best practices and the analysis of new case studies.
- Statistical analysis and models for the elaboration of three **economic cases**: on the leaky pipeline, working conditions in the sector and regarding female entrepreneurship in the sector.
- In-depth **interviews**: to inspire women (role models) and stakeholders (for case studies) as well as other relevant stakeholders.
- **Surveys** of recruiting companies and associations (women associations and ICT associations) as well as other relevant stakeholders.

Table 2. Summary of research methodologies by type of objective

Result / Methodology	Economic cases	Role models & Career paths	Case studies	Update of data baseline	Analysis of Social media campaigns	Revision of Code of Best Practices	Recommendations
Desk research	✓	✓	✓	✓	✓	✓	✓
Interviews		✓	✓			✓	✓
Surveys			✓			✓	✓
Statistical analysis and models	✓						✓

Source: prepared in-house

Desk research

The desk research uses online and printed sources, mostly consisting of reports, studies and databases from European and US academic institutions and public administrative bodies.

A comprehensive list of bibliographic resources used for the elaboration of this can be found in the References section.

Statistical analysis and models

With the construction of economic cases we intend to create arguments for the different stakeholders (parents, educators, universities and research centres, businesses, governments and of course the women themselves) for the incorporation of women into the ICT sector. Three cases are designed:

1. ***Descriptive evidence on gender differentials on (i) training in ICT and (ii) working in ICT for European Countries.*** This economic case allows us to identify the type of undergraduate and graduate education acquired by men and women and the actual occupation. In particular, we look at those who obtain bachelor degrees in ICT studies, and who are working in the ICT sector providing relevant information on the leaky pipeline and other analysed topics.
2. ***Differentials on Job Conditions for ICT workers.*** This case analyses working conditions of employees, both men and women, particularly with regard to their satisfaction with the job, recognition by employers, wage differentials, possibilities of reconciling family and work, promotions, etc. The aim is to ascertain whether or not there are gender differences which may prevent women from choosing to work in these sectors or to abandon them at an early stage.
3. ***Entrepreneurs in the ICT sector*.** This case looks at whether male and female entrepreneurs in this sector exhibit differences in terms of proportion, as well as in other job characteristics, such as number of employees and their gender, satisfaction, wages, promotions, etc. This analysis may well serve to help design economic policies directed to promote, if necessary, the situation of female entrepreneurs in the ICT sector.

In Economic Case 1 we present descriptive differences with regards to percentages of males and females who, after having studied in fields related to ICT topics, either (i) do not work at all, or (ii) do work but not in ICT related jobs. In this case, weighted wage gaps are presented, where weights reflect the representativeness of each individual in the whole population.

In Economic Cases 2 and 3 we present descriptive differences in gender with respect to job conditions, and again weight all descriptive gender gaps by the representativeness of each individual in the whole population. In addition to this, we also estimate a different set of job conditions for men and women working in the ICT sector. The methodology we have employed for these estimations is as follows:

The purpose of this analysis, when it comes to the estimation of job conditions such as satisfaction, flexibility, stress, and feelings of discrimination - all of which have been presented as binary variables (1 or zero) - we select men and women working in the ICT sector and estimate each of the work condition variables selected above on a set of controls. These controls include age, educational level, etc., together with an indicator per female. Given that the dependent variables are discrete, we use Maximum Likelihood estimations – logic models to be more precise. The coefficient of the female indicator reveals whether or not gender differences persist when we compare similar men and women in terms of the included controls.

In addition, we report odd-ratios: A value of 1 (or not significantly different from 1) would reveal no gender difference in the estimated variable. A smaller value would reflect a lower position of women with respect to men.

However, for the estimation of wages, we use the standard Ordinary Least Square Estimator. As the number of observations, particularly for some of the groups of countries, is very low, we have estimated all countries together in the estimation, although indicators for each of the four groups are also included as controls.

Further details on the methodology used for the economic cases are included in Annex II.

Surveys

As a way in which to obtain relevant information on the issue, two different surveys have been carried out: of business associations and recruiting companies.

Results lack statistical significance but have helped identify trends and support findings from other sources.

- Surveys of entrepreneurs, women in ICT and women in management associations.

  The objective is to ask business associations and women's associations, as great connoisseurs of the reality of the sector, about the presence of women in the sector, barriers and drivers for their participation and the reality of entrepreneurship in Europe from a gender perspective.

  A different survey is designed for each category of associations (3) with the aim of gathering as much information as possible on Women and ICT in Europe. Questionnaires include a maximum of 6 open questions to limit the time needed for answering and to allow for the maximum number of responses. Questionnaires are sent and received via email.

  Associations are selected on the basis of their objectives and their transnational character. All associations included in the survey

operate at the European level and are devoted to the defence of the interest of women in the ICT sector, professional women and entrepreneurs (both general and female entrepreneurs). A total of 17 associations are contacted, including 9 women in ICT associations, 5 entrepreneurship associations and 3 women in management associations.

- Survey of recruitment companies.

  The objective is to gauge the extent to which gender is part of their interests and to identify what kind of gender data on employment in the ICT sector and what kind of gender analysis they do.

  In order to achieve this task a questionnaire with 15 closed questions is designed and tested through 2 interviews conducted by call conference; the first interview is with an online recruiting service whilst the second is with a recruiting company specialising in IT professionals.

  Questions focus on women's participation in the labour market in the ICT sector, salaries, and hiring companies' preferences and attitudes regarding gender.

The final questionnaire is sent via email to 38 recruiting companies in Europe, including general recruiting companies and recruiting companies specialising in IT.

In addition, a specific survey is carried out across the signatories of the Code of Best Practices for Women and ICT for an assessment of the initiative. In total, 56 organisations are contacted.

Interviews

In order to achieve the goal of mapping the possible career paths of 10 ICT jobs indicated in the tender and to obtain deeper knowledge in terms of the reasons which discourage women from entering and remaining in the ICT sector, 10 semi-structured interviews are conducted with relevant women in the sector.

In drawing up the 10 ICT job profiles, balance between technical and less technical positions as well as backgrounds are taken into account. Finally, the profiles selected are as follows:

1. ICT company Manager
2. ICT Policymaker
3. ICT consultant
4. HR Responsible at ICT company
5. Software developer
6. Technical support
7. Network engineer

8. IT systems administrator
9. Videogames developer
10. Online marketing responsible

A search is carried out in order to find a relevant woman for each position; a woman who would be able to act as a role model and inspire young girls. Other variables such as age, country or sector or activity are also taken into account in order to develop a detailed vision of the problem.

Selected women are contacted and interviewed. These interviews are conducted face-to-face, via phone or via videoconferencing depending on the preferences of the interviewees. All of the interviews are recorded and transcribed.

In addition, 2 interviews are carried out with recruiting companies in order to test the quality of their survey questionnaires and with representatives of the organisations included as case studies.

Social media campaigns analysis

A final task of the project consists of the analysis of successful social media campaigns which could be applicable to the objectives of the Commission regarding women in ICT, particularly to ensure that more girls choose careers in the sector.

An examination of the reactions to certain social media campaigns is conducted in order to reveal the elements common to successful media campaigns. The methodology used for this task is desk research.

A wide variety of campaigns are examined from both the public and private sectors. A total of 4 campaigns, 1 from the public sector, 1 from the non-profit sector, 1 from the ICT sector and 1 from the non-ICT sector, are selected for deeper analysis.

These cases are selected as model or “exemplary” campaigns which harness the spirit, purpose and power of social media and provide elements which could be used to help promote, and entice women to enter ICT fields. Selected cases include:

- “Dumb Ways to Die” from the Melbourne Metro.
- Code.org.
- “Little Amazing Show” from Nokia.
- KLM.

DESCRIPTION OF THE PROBLEM

Women Active in the ICT Sector reflects Europe's need to get more women to participate in the ICT sector, as part of the sector's workforce and, particularly, in decision-making positions.

The facts are that women do not choose ICT studies, and that they are underrepresented in the workforce of the sector. Indeed, they leave the sector at early stages of their careers and do not achieve managerial positions at the same level as their male counterparts.

These phenomena have led to a loss of talent and value for the ICT sector and the whole European economy and society.

In fact, we have estimated that if women who have studied ICT-related fields and who are currently not working were to work in the ICT sector in the same proportion as men, given the level of Average Productivity in the ICT sector, **the gain for the European GDP each year would be around 9 bln Euro** (1.3 times Malta's GDP)[34].

The integration of women with ICT studies into the ICT workforce in the same proportion as men would represent a gain for the EU GDP of ***9 bln Euro***

The following summarises the current situation of women in Europe's ICT sector and describes the main problems which affect women within the sector:

[34] Considering data available from the European Labour Force Survey, if we consider those men and women who attend university to take ICT related studies, we obtain the following figures with regards to their actual labour market situation.

	Women	Men
• % work in ICT	10.76%	20.67%
• % work in non-ICT service sectors	44.28%	27.89%
• % work in other sectors	21.51%	36.17%
• % do not work	23.46%	15.27%

This table reveals that there are around 10% more men who work in ICT compared to women. Indeed, this difference is not much different to the one observed between those who, having studied ICT related issues (at university level) do not work as compared to men (23-15=8%). On the contrary, we find similar proportions of men and women who work in other sectors (66% women versus 64% men).
Suppose the institutions design mechanisms to encourage women who do not work today (even though they studied ICT related fields at university level) to work in the ICT sector. If the percentage of women who do not work resembles that of their male counterparts and these women who enter the labour market are directed to the ICT sector, this would mean the following new hypothetical distribution:

	Women	Men
• % work in ICT	18.95%	20.67%
• % work in non-ICT service sectors	44.28%	27.89%
• % work in other sectors	21.51%	36.17%
• % don't work	15.27%	15.27%

What would this change mean in terms of GDP Gains for all of Europe?
The increase in the 8% of women would affect around 115.000 women, who would incorporate from No work to the ICT sector.
Given that the Average Productivity (per person) in the ICT Sector (Services) is around 78.000 Euro* per year, the net gain we would get on average through this action would be, per year:
115.000 * 78.000 = **8.970.000.000 € per year**

* Source: Stančík, J. & Desruelle, P. (2012): The 2012 Predict Report: An Analysis of ICT R&D in the EU and Beyond. European Commission. Joint Research Centre. Institute for Prospective Technological Studies

1. The low number of women in the sector and the leaky pipeline.

Women represent 59% of all tertiary graduates and 45.7% of total employees in Europe. The high participation of women in tertiary studies[35] and in the workforce does not occur in the ICT sector, where they are underrepresented. Women represent around 33%[36] of total graduates in science and technology and around 32% of employees of the ICT sector[37].

Although there is a demand for digital professionals which is estimated to grow by more than 100,000 annually,[38] the number of students choosing STEM[39] disciplines is decreasing; a problem which affects both men and women. However, there is particular room for improvement in female participation, since from the total number of female students in tertiary education only 9.6% study ICT-related degrees[40], compared to 30.6% of men.

If we consider tertiary graduates instead of students, we see that per every 1,000 women in Europe aged 20-29, there are 8.3 tertiary graduates in Science and Technology in 2010 (same proportion as in 2005), while from every 1,000 men 16.6 are tertiary graduates in Science and Technology (18 in 2005)[41].

Indeed, with this in mind, the first problem is that girls do not choose ICT-related studies, whilst the second is that they choose ICT careers to an even lesser extent. From all women in the labour market only 2% of them work in the ICT sector, compared to 3.6% of men[42].

Table 3. Science and Technology graduatesin Europe

Tertiary graduates in science and technology in EU27 per 1,000 persons aged 20-29 years (2005 and 2010)					
Total		Male		Female	
2005	2010	2005	2010	2005	2010
13,2	12,5	18,0	16,6	8,3	8,3

[35] By tertiary education we refer to level of education: ISCED97 (levels 5 and 6).

[36] Source: Eurostat (2011): Human Resources in Science and Technology (HRST). Data extracted in March 2013.

[37] Source: Eurostat (2012): Labour Force Survey2012Q4. Data for EU27. Data extracted in March 2013

[38] Source: European Commission (2013): *European Commission launches a Grand Coalition for Digital Jobs* http://europa.eu/rapid/press-release_IP-13-182_en.htm

[39] STEM is an acronym which refers to science, technology, engineering and mathematics.

[40] ICT studies include:
- Physical Sciences (441 in Eurostat Codes)
- Mathematics and Statistics (46, 461 and 462 in Eurostat Codes)
- Computing (48, 481 and 482 in Eurostat Code)
- Engineering and Engineering Trades (52, 521, 522, 523 and 524 in Eurostat Codes).

[41] Source: Eurostat: Human Resources in Science and Technology (HRST):
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/R_%26_D_personnel

[42] Source: EUROSTAT. Labour Force Survey 2012Q4. Data for EU27.

Source: Human Resources in Science and Technology (HRST), Eurostat[43]

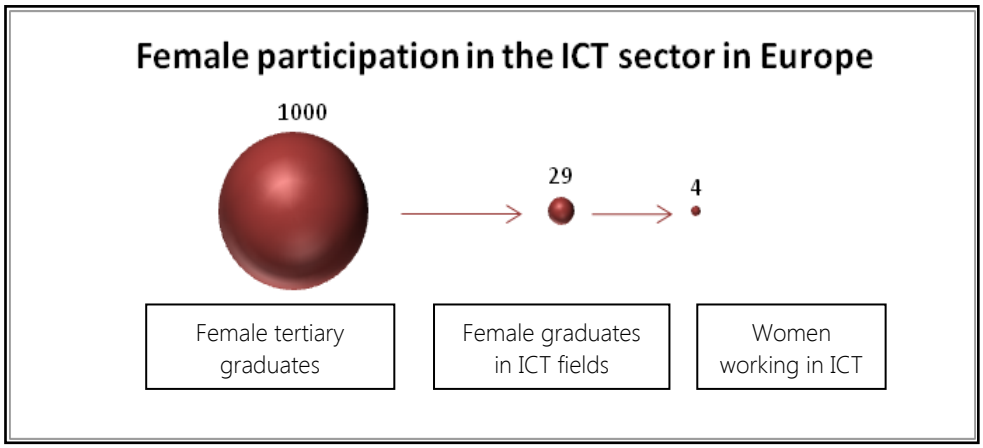
Additionally, one of the most important, and worrying, phenomena in the sector is the so called "leaky pipeline", defined as women abandoning the sector mid-career.

The **leaky pipeline** is a phenomenon widely revised and mentioned in existing literature[44], both in Europe and the US. It is linked, to a great extent, to maternity.

Our economic cases show that[45]:

- For every 1,000 women with a bachelor degree in Europe, 29 hold a degree in ICT, compared to 95 men (3 times more men than women).
- From those 29 women with an ICT bachelor degree, only 4 currently work currently in the ICT sector. From those 95 men with an IT bachelor degree, 20 work in the ICT sector (5 times more than women).

Figure 1. Female participation in the ICT sector in Europe



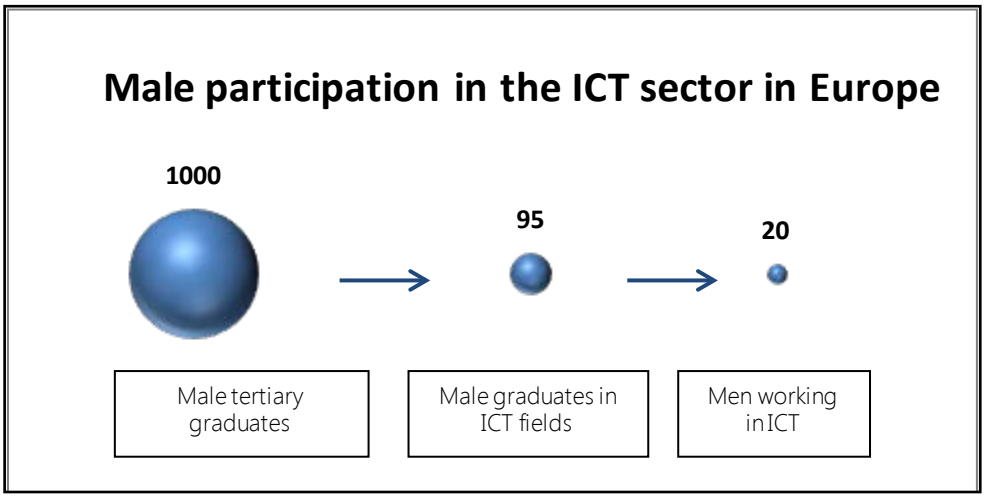
Source: prepared in-house, based on European Labour Force Survey (2011)

[43] At the moment of preparing the study the last data available refers to 2010.

[44] Sources:
- *European Commission (2006)*
- Gras-Velazquez, A., Joyce, A. & Debry, M. (2009): WHITE PAPER. Women and ICT: Why are girls still not attracted to ICT studies and careers. Insight.
- Griffiths, M. & Moore, K. (2010): 'Disappearing Women': A Study of Women Who Left the UK ICT Sector. Journal of Technology Management & Innovation.
- Hunt, J. (2012): Why Do Women Leave Science and Engineering? Discussion Paper No. 6885. IZA Institute for the Study of Labor.

[45] Source: European Labour Force Survey 2011. ICT refers to J sector

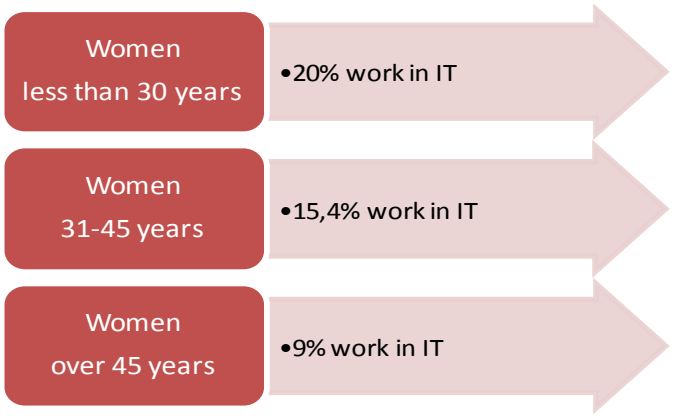
Figure 2. Male participation in the ICT sector in Europe



Source: prepared in-house, based on European Labour Force Survey (2011)

In terms of age, the leaky pipeline in the ICT sector clearly increases in the case of women: among those who study a bachelor degree in ICT fields, the older the women are, the less likely it is that they work in the ICT sector[46].

Figure 3. Female Leaky Pipeline



Source: prepared in-house based on European Labour Force Survey (2011)

Figure 3 shows the participation of women with ICT-related bachelor degrees in the ICT workforce per group of age. 20% of women aged less than 30 years with a bachelor degree in an ICT field work in the sector, while only 9% of women aged over 45 years and with these degrees do so.

Although the **"leaky pipeline"** is an important factor influencing the lack of women in the ICT sector, all women interviewed during this study affirm that they have never thought of leaving the sector. In fact, younger women

[46] It should be noted that direct evidence regarding the leaky pipeline can only be obtained when we have longitudinal data so that we follow individuals over time and get information regarding their labour market trajectory. Given that the European Labour Force Survey offers cross-sectional data, we can only provide indirect evidence of the quit rate of women from the ICT sector such as their age.

do not feel that it is a very widely spread phenomenon, while older women have more examples in their environment and see it as a problem to a greater extent.

It is essential to take into account that all women interviewed during this study are selected as role models for girls and women all around Europe and that they show an extraordinary passion for their careers and the ICT world. However, it is clear during our analysis that women with more experience in the sector, and particularly women with a family, are more aware of the phenomenon. This confirms the idea that the leaky pipeline phenomenon occurs more often in the middle of women's careers and is commonly linked to maternity.

2. The difficulties of women reaching managerial and decision-making positions.

In Europe, the largest quoted companies count 16% of women in their highest decision-making bodies[47]. Worldwide, in 2010 96% of companies' CEOs in the IT & Telecom sectors are male[48].

Table 4. % of women in supervisory board or board of directors in largest quoted companies

		Highest decision making body			
Number of companies		President		Members	
Covered	With data	Women (%)	Men (%)	Women (%)	Men (%)
582	582	3	97	16	84

Source: European Commission (2012): Database on women and men in decision-making

The so-called "glass ceiling" is clearly identified by women: according to a 2011 study from the Institute of Leadership and Management from the United Kingdom[49] 73% of women managers believed that there are barriers preventing them from progressing to top levels, and that these barriers are acknowledged by women at all ages, but particularly those with longer careers (63% of under 30s, 71% of 31–44s and 77% of over 45s

[47] Source: European Commission (2012): Database on women and men in decision-making. Data extracted on March 2013.

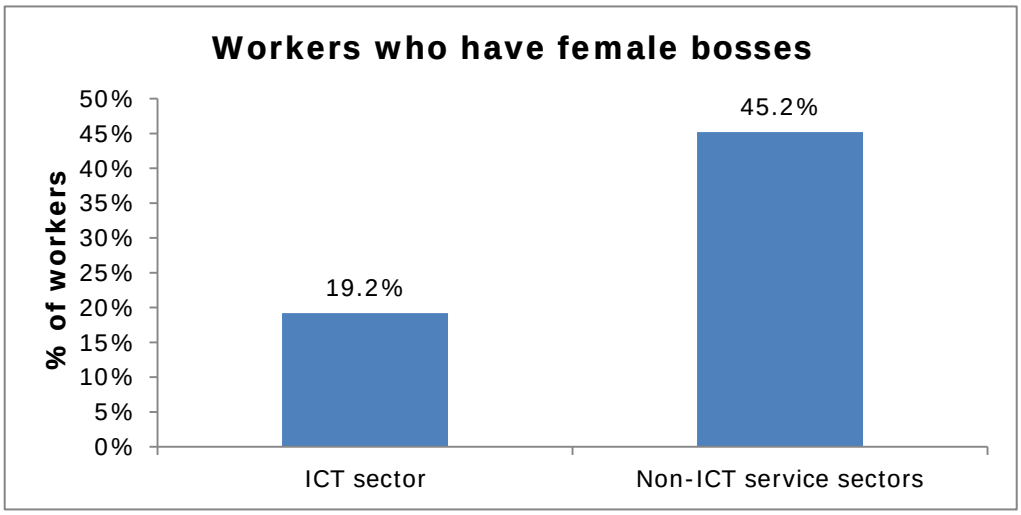
[48] Source: Corporate Gender Gap Report 2010. World Economic Forum. Geneva, Switzerland 2010

[49] Source: Institute of Leadership & Management (2011): *Ambition and gender at work*. pp 5. London, UK.http://www.i-l-m.com/downloads/resources/centres/communications-and-marketing/ILM_Ambition_and_Gender_report_0211.pdf

acknowledge the barrier). In contrast, only 38% of men believe the glass ceiling exists.

Although this is a general problem in all sectors, the percentage of female bosses in the ICT sector is much smaller than in other non-ICT sectors. Our economic case shows that in the ICT sector 19.2% of workers have female bosses, while 45.2% of workers in the non-ICT service sector have female bosses[50].

Figure 4. Workers who have female bosses in the ICT sector and in the non-ICT service sector



Source: Prepared in-house based on Survey on Working Conditions (2010)

3. The low number of women entrepreneurs in the sector

Recent studies have shown that Europe has problems when it comes to creating innovative enterprises, those based on R&D activities and which have great potential growth and create added valued jobs (and externalised less to emerging countries)[51]. This fact is particularly relevant in the ICT sector, which is an essential driver for the economic growth and innovation in Europe.

Indeed, this finding, which is a key issue for Europe in general, is particularly relevant when we focus on women. Women only represent 19.2% of all entrepreneurs in the ICT sector, while they represent 53.9% of entrepreneurs in the non-ICT service sectors[52] and constitute 31.1%[53] of all

[50] Data elaborated for this study from the Survey on Working Conditions 2010. ICT sector refers to the NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1). Under the non-ICT Service Sector we include the following sectoral activities: K, L, M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N, O, P, Q and S.

[51] According to the Global Entrepreneurship Monitor, which compiles comparable data across countries, in 2010 "early-stage" entrepreneurs made up just 2.3% of Italy's adult population, 4.2% of Germany's, and 5.8% of France's, while it was 7.6% in America, 14% in China and 17% in Brazil.

[52] Data elaborated for this study from the Survey on Working Conditions 2010. ICT sector refers to the NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1). Under the non-ICT

European self-employed (all sectors). From all self-employed women in Europe, only 2% work in the ICT sector[54], while 3.5% of self-employed men work in the ICT sector.

There is also a **fourth element** which is most commonly included in the debate regarding the situation of women in the ICT sector, and in the labour market in general. This is **the Gender Payment Gap (GPG)**.

According to the Gender Payment Gap statistics from Eurostat, for the economy as a whole, women's gross earnings are, on average, 16% below those of men in 2011 in EU27[55].

If we use as a reference the European Survey on Working Condition 2010[56] we see that in the ICT sector the average GPG[57] is -21% while the GPG in the non-ICT service sector[58] is -12%.

However, if we use the adjusted gender payment gap, it is observed that the GPG in the ICT sector is **0%**, meaning that once we compare similar men and women in terms of age, educational level, type of contract, size of firm, type of sector (private/sector) and occupation, there is no wage gap between men and women in the ICT sector, while the GPG (adjusted) in the non-ICT service sector[59] is **5%**.

Summarising these findings:

- If we consider the unadjusted payment gap (the average difference between hourly wages between men and women, as used by Eurostat) the results show that:
  - The GPG in the ICT sector is 21%.
  - While the GPG in the non-ICT service sector[60] is 12%.
- If we consider the adjusted gender payment gap (meaning that only men and women with similar socio-economic characteristics are considered):
  - The GPG in the ICT sector is **0%.**
  - The GPG in the non-ICT service sector[61] is **5%**.

Service Sector we include the following sectorial activities: K, L, M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N, O, P, Q and S.

[53] Source: Eurostat (2012): Labour Force Survey.

[54] ICT sector refers to the NACE R2 Information and Communication (J)

[55] Source: Eurostat (2013): Gender Payment Gap Statistics. Data extracted in March 2013.
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Gender_pay_gap_statistics

[56] Source: European Survey on Working Conditions 2010. The survey includes 34 countries EU27, Norway, Croatia, the former Yugoslav Republic of Macedonia, Turkey, Albania, Montenegro and Kosovo.

[57] This refers to the unadjusted payment gap (the average difference between hourly wages between men and women) as used by Eurostat.

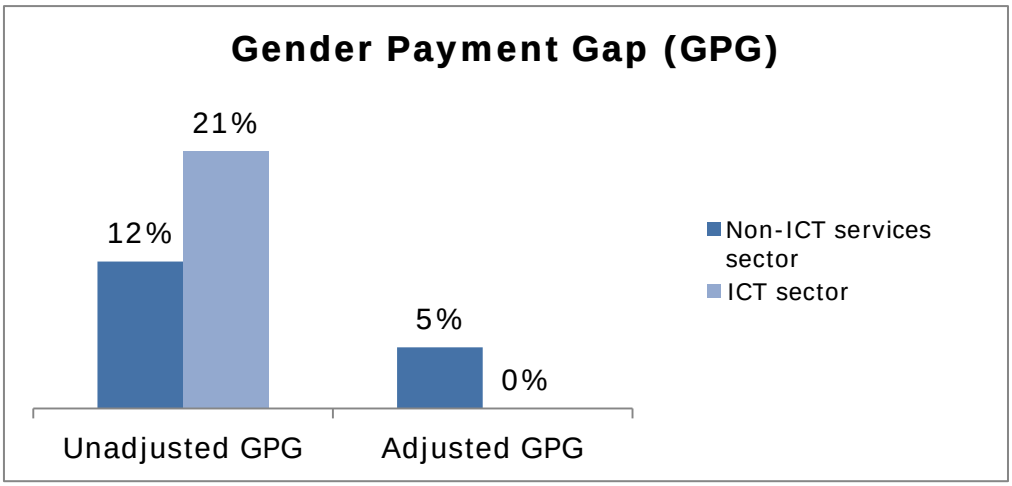
[58] Source: EUROSTAT. Labour Force Survey. ICT includes the J sector (Information and Communication).

[59] Ibid.

[60] Source: EUROSTAT. Labour Force Survey 2012Q4. Data for EU27. ICT includes the J sector (Information and Communication).

[61] Ibid.

Figure 5. GPG in the ICT and in the non-ICT service sectors



Source: Prepared in-house based on data from Survey on Working Conditions (2010) and Labour Force Survey (2011)

The fact that the adjusted gap drops to zero, whereas the unadjusted one amounts to 21%, is due to the fact that most women in the ICT sector work in lower paid jobs, compared to those who end up working in jobs similar to those occupied by their male counterparts where there is no gender wage gap. The problem, therefore, relates to the lack of women in top positions in the sector, and their predominance in less-qualified jobs.

Women in ICT in Europe still:

- *Participate little in the sector*
- *Leave mid-career more often*
- *Are affected by a "glass ceiling"*

For this reason we can recapitulate the main problems which affect women in the ICT sector as follows:

1. Women do not choose to study and work in the ICT sector.
2. Women leave the sector in mid-career more often than men.
3. Women are very much affected by the "glass ceiling" in the sector.
4. There are very few female entrepreneurs in the ICT sector.

There are many and varied causes for all these problems, the most common of which include[62]:

Cultural traditions and stereotypes

1. Cultural traditions and ideas regarding women's role in society:

[62] These causes have been identified from the analysis of existing literature and case studies on the topic and the interviews carried out during the study. Secondary sources can be found in the References chapter of this report.

- Cultural factors pressuring women to stay at home after maternity leave.
- Stereotypes about leadership qualities, which are still linked to men.
- Stereotype of women having “un-technical” minds or poorer capacities for STEM studies and careers.
- Negative connotations of feminism (such as aggressiveness or lack of femininity).

2. Stereotypes about the sector:
    - Existence of strong stereotypes which see the sector as more suitable for men.
    - Lack of knowledge regarding the jobs which can be developed in the sector.

Internal barriers: socio-psychological factors pulling women away from the sector and its top positions

3. Reticence to talk openly about gender issues.
4. Lack of self-confidence.
5. Difficulties when it comes to negotiating and competing in the sector and risk aversion.

External barriers: features of the ICT sector influencing the gender gap

6. Strongly male-dominated environment and discrimination
    - Women have to prove that they are technically capable of performing certain tasks which are associated more with men.
7. “Old-boys' network” culture: the sector follows informal rules from which women are excluded: meetings in the evening, leisure activities only for men, participation in clubs, staying in the office late in the evening, etc.
8. Complexity of reconciling personal and professional life, due to long working hours and heavier workloads:
    - Ever-changing environment: difficulty keeping skills up-to-date.
    - Less time investment, which is very important in relation to taking specialised training, and developing professional networks, etc.
    - Problems with geographical mobility (limited flexibility of women).
9. Lack of role models in the sector.

Figure 6. Problems that prevent women from entering the ICT sector

Cultural traditions and stereotypes:	1. Cultural ideas about women's role in society
	2. Stereotypes around the sector
Internal barriers:	3. Reticence to talk openly about gender issues
	4.Lack of self confidence
	5. Difficulties at negotiating and competing in the sector
External barriers:	6. Strongly male dominated and discrimination
	7. "Old-boys network" culture
	8. Complexity of conciliating personal and professional life
	9. Lack of role models in the sector

Source: prepared in-house

PRIORITIES FOR ACTION AND POLICY RECOMMENDATIONS

PRIORITY 1. BUILD A RENEWED IMAGE OF THE SECTOR AMONG WOMEN AND MAINSTREAM SOCIETY

The problem

Girls generally see jobs in the ICT sector as solitary, boring and useless for helping others[63]. These ideas keep girls away from the sector, since they prefer to work with people instead of machines and to perform tasks related to communication and helping others[64].

Furthermore, there are numerous stereotypes which surround the sector, such as the existence of very long working hours, the predominance of a strong male dominated environment, the difficulty of reconciling personal and professional life, etc.

How we identified the problem

The idea of the need to change the image of the sector is found in reports and existing case studies[65]. Traditionally speaking, the negative image of the sector has been linked to the following factors:

- Work in the sector is connected to isolation and people with limited social skills.
    - Former Policymaker: *"And of course the stereotypes that people have about IT: they normally think that they are people sitting alone with their computers. People in IT are normally very creative and very innovative"*.
    - ICT consultant: *"People just assume that people that work in IT, even women, are kind of nerd. So far I didn't find any. I mean, there are people really very technical in language, however I didn't consider them as nerds: most of them are very open-minded, friendly, communicating"*.
- The sector has very hard working hours and schedules[66].

Although these stereotypes persist, certain things are already changing and some improvements have been made. For instance, companies such as

[63] Source: Gras-Velazquez, A., Joyce, A. & Debry, M. (2009)

[64] Ibid.

[65] Sources:

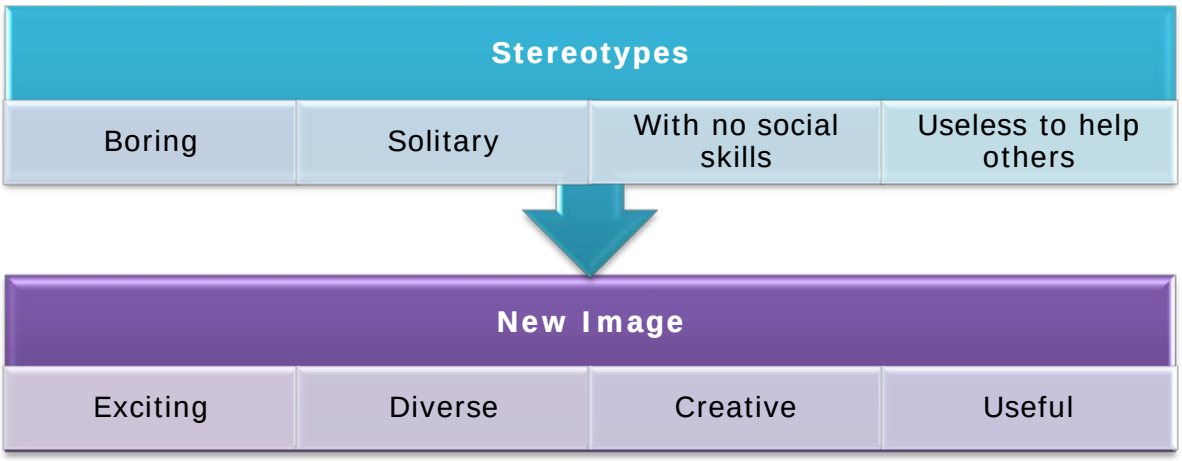
- European Commission (2006)
- Valenduc, G., Vendramin, P., Guffens, C., Ponzellini, A., Lebano, A., D'Ouville, L., Collet, I., Wagner, I., Birbaumer, A., Tolar, M. & Webster, J. (2004)

[66] Source: European Commission (2006)

Google have been able to change this image and as a result most young graduates want to work for them[67].

From our interviews - and these examples of successful companies[68] - it can be deduced that the image of the sector as being **exciting** and, particularly**, creative** should be enhanced.

Figure 7. Image of the ICT sector among women



Source: prepared in-house

In addition, the concept of ICT as an **enabling tool** for innovations in health, governance, communications, commerce, etc. may well be a telling success factor. This allows for great mobility among types of jobs within the sector and in other sectors whilst also providing an abundance of chances for women to meet their professional expectations.

- IT Support Director: "*For me technology offers something very special to the society: it for example enables new medical treatments; gives people better and easier access to education. In many aspects makes people more equal… and this is the very fascinating aspect of technology. And, of course working in support means you help people. Furthermore, in the technology sector you have the opportunity to work with highly skilled people from around the world.*"

Some previous studies have already pointed out these ideas as well[69] although work is still needed in this sense.

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[67] The organisation Universum publishes annually a Student Survey in various countries from which it elaborates on the *Top 100 Ideal Employer Rankings*. Both Global and European rankings are led by Google in 1st position. More information can be found at: http://www.universumglobal.com/IDEAL-Employer-Rankings

Linked also elaborates on a list of the most in demand employers based on the interactions of its more than 175 million members, and Google is again first in the global ranking. More information can be found at: http://talent.linkedin.com/indemand/?trk=blog10.12#global

[68] Just a look to Google's jobs website gives an idea of the image the company wants to present. The slogan for their jobs page is "Do cool things that matter". http://www.google.com/about/jobs/lifeatgoogle/

To guarantee a comprehensive approach to the sector a double perspective should be applied:

- Make more visible the enabling role of ICT for the more technical areas of the sector.
- Make more visible the creative side of technologies regarding areas such as mobile technologies, applications, digital content and the Internet.

General recommendations

1. Create a campaign showing the aspects of the sector which are more interesting for young people, and particularly, for women: the sector is not only a world of "geeks", but is also about communication, and is:

> *"ICT, and particularly mobile technologies, are about communication before being about software"*
>
> *(ICT company manager)*

- **Exciting**: always innovating and inventing new services and products.
- **Diverse**: it is one of the most globalised sectors and diversity is a key value. It is an international environment which allows you to travel and meet different people all the time.
    - Videogames developer/young entrepreneur: *"I think it is an amazing industry because it mixes skills and it is international. There are people with different profiles and nationalities working in the industry so you can really grow as a person, and that is a point both for the girls and for the boys. I believe that it is a very interesting industry because of that. I think that being part of the industry right now makes you grow personally and professionally"*.
    - *ICT company manager: "actually the reason why I joined telecom after doing research to gain a PhD is because I found research very interesting and creative, you have to solve very big complex problems, but you don't really interact with people that much. Clearly what I found in mobile is that I am always interacting with people: mobile operators, vendors, start-ups, clients, people of the Commission, people of the Government… You have lots and lots of contacts: this is about communication before being about software or IT or very technical things"*.
- **Challenging**: you have to adapt to a changing environment, be creative and always be (technically) learning.

[69] Source: Gras-Velazquez, A., Joyce, A. & Debry, M. (2009)

- Network Engineer: *"the most rewarding aspects of working in the sector are the personal satisfaction of understanding technology, solving problems… It is a challenge that motivates me and I don't stop growing and increasing my knowledge. I learn things constantly, new technologies and new protocols, etc."*.

- **Full of opportunities**: the range of different tasks and positions within the sector is one of the most diverse (one can write code, then manage a project, then design strategies, be a policy maker). In fact, most women, even if they begin in very technical positions, tend to end in more managerial or less technical positions (see Annex VI).
- Is an **enabling tool for future activities**: e-health, e-government, communications, transport, commerce, etc.
    - Digital Communications Manager: "*finding a solution in a collaborative way is very rewarding. You ask yourself "how to get this?" And afterwards people use you solution and this is very rewarding".*

- **Profitable**: is better paid than other sectors and offers more flexibility.

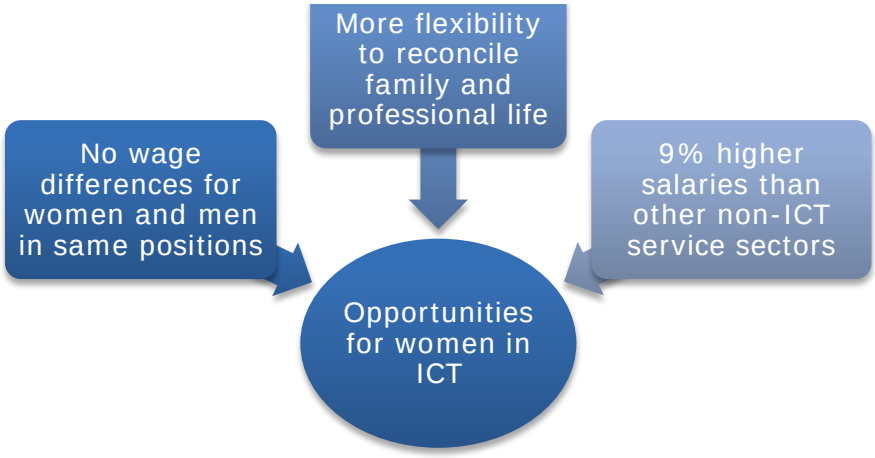
  As we have found in our economic case:
    - The Gender Payment Gap is lower in the ICT sector than in other sectors: **no gender differences in hourly wages emerge** between similar men and women in the ICT sector from our analysis.
    - Women in the ICT **sector enjoy increased flexibility** when it comes to arranging their time schedule for personal or family matters than their female counterparts in the non-ICT sectors.

"Finding a solution in a collaborative way is very rewarding"

(Digital communications manager)

Furthermore, women in the ICT sector **earn almost 9% more than similar women in the non-ICT sectors.**

Figure 8. Benefits for women in the ICT sector



Source: prepared in-house

2. Help creating **role models** through visibility of key women in the sector:

- Increase the number of women at IT public events (general events, not events specific to women). Since there are few women, those who are in the sector are more noticeable (for good and for bad).
    - *ICT company manager: "I think being a woman both helps and hurts. One of the things we have to be honest about is that there aren't many women, especially if you are in the technological side, and everybody sees you and remembers you, which is both good and bad. People see you and remember you. If you do good things they notice, but if you make mistakes, and of course you do, because everybody does, there is probably more weight, more pressure for you".*
- Specific media campaigns with real women (with real problems and real success cases).
- Direct actions in schools.

3. Improve the image of the sector **among parents** so that they encourage girls to study and work in the sector:

- Make available evidence supporting the equal capabilities of women, make STEM studies more visible (there is still the idea that ICT is "too difficult" for girls in certain cultures).
    - ICT company manager: *"there are people who sometimes overestimate the complexity and the difficulty of studying science or mathematics. Also there is an image, which I think it is completely cultural, that this is "not for girls or*

women". In my experience it has never been the case, there is nothing either female or male about mathematics. It is just about what are you comfortable with: abstraction, theories, and numbers".

- Promote the idea among parents of the **great career opportunities** within the sector and the **economic advantages** (higher salaries, less unemployment).
    - Digital Communications Manager: "*at the age of 10 my dad got me into programming and I had a big exposure to videogames through the shop my parents owned. My parents thought that the future was computers, so that definitely influenced me"*.

4. Promote the image of the sector as **accessible** from a great variety of fields and for a great variety of profiles:

- Enhance the acquisition of ICT skills through life-long learning programmes: The sector is very wide and diverse, so there are many "paths" to get to it. Many jobs do not require one single kind of formal study (university studies) but "affordable" training and certifications. It is never too late to enter the sector!

Concrete actions

EC / EU
- Establish specific goals in the frame of the Europe 2020 Strategy for women and ICT.[70]
- Improve accountability of gender measures within ICT funding programmes (Horizon 2020, etc.).
- Institutional campaign targeting girls who are in the process of deciding their branch of studies of deciding branch of studies and their families disseminating economic benefits for women working in the sector: ▪ Traditional media campaigns in cooperation with national authorities and national broadcasters: TV and radio (targeting parents). ▪ Social media campaigns targeting girls.
- Institutional campaign showing studies proving the capacity of girls for all type of studies: ▪ Traditional media campaigns in cooperation with national authorities and national broadcasters: TV and radio (targeting girls and parents). ▪ Social media campaigns targeting girls.

[70] Source: European Women's Lobby (2012): Ticking clocks – Alternative 2012 Country-Specific Recommendations to strengthen women's rights and gender equality in the Europe 2020 Strategy. Brussels.

- Promote the visibility of role models using real inspiring women (aim to create social change):
  - Launch a social media campaign with the direct participation of inspiring women. Channels should be selected for each type of target.
  - Make specific campaign showing diverse career paths.
  - Create spaces for girls to share their vision of the sector.
  - Create quotas of female speakers in all ICT events funded by the EU.
  - Elaborate series of documentaries or conferences on success cases of women in ICT in TED or similar platforms.
  - Focus in the enabling role of ICT and the creative side of the industry.
- Make a study on current role models of European young girls to see what really impacts them and design more suitable strategies.
- Promote the acquisition of ICT skills though informal learning.
- Create a coalition between the industry and the most relevant technical institutions (Universities and research institutions) to design communication campaigns and define priorities.
- Facilitate the exchange of opinions between the media & entertainment industry and the ICT industry (particularly those targeting children and young people) in order to change the image of tech products and jobs e.g.: stereotypes in movies, TV serials, cartoons and promote more gender-neutral products (toys, devices, videogames, etc.)
  - Workshop.
  - Debate platform.
  - Promotion of exemplary cases.
- Coordinate initiatives among DG's and Units, avoid duplicating initiatives, by including the diversity issue in other related initiatives.[71]
- Analyse existing campaigns and initiatives from the 3rd sector to support them, instead of launching new ones with similar objectives.

Industry

- Create national dissemination programmes with educational institutions or authorities, to show in schools the "real side of the sector", focusing on the application of ICT and its enabling aspects. Actions designed for kids and for teachers and career advisors should be included.
- Promote role models inside and outside the company: as an image benefit for the company ("show off" your female workers).
- Further highlight the potential benefits of ICT professional training and official sector's certifications (SAP, ITIL, CISCO, Microsoft, etc.)
- Create the "ICT Company Open Day" for girls.

[71] For example, in the recently launched campaign on maths and science: http://haveyoursay.eisri-summit.eu/index.php/277353/lang-es

Member States
- Create a partnership with the EC for all institutional campaigns suggested. - Establish national targets in the frame of the Europe 2020 Strategy regarding women and ICT. - Revise, together with the industry, all ICT-related syllabuses at primary and secondary education levels. - Create a national programme of dissemination of ICT in school with visits to companies and public events (both for men and women). - Organize schools' challenges (competitions) widely disseminated (national broadcasters) for young students (10-16 years old) on ICT topics, with at least 50% of girls participating. - Focus existing training resources for unemployed people to encourage women into the sector (even if with a different background), e.g.: SAP certifications, ITIL, CISCO, etc.
3rd Sector
- Create a partnership with the EC for all institutional campaigns suggested. - Assist all stakeholders in the previous recommendations by providing advice, contacts, best practices, etc.

PRIORITY 1.2. PROMOTE A "DIVERSITY" APPROACH

The problem

Although the term "feminism" describes a wide range of movements and theories which lead to a variety of interpretations and reactions, based on the results of our analysis, we can affirm that, in general, European women are reluctant to label themselves as feminists and that the term has negative connotations, particularly among young people, who also feel that it is "old fashioned"[72].

As a result there is disinclination towards certain gender policies, particularly the existence of quotas for private companies.

How we identified the problem

Due to the existing reluctance among young people to self-identify with the term "feminist", some existing studies[73] have already suggested moving towards a more integrating term such as "diversity". This has also been recommended by part of the contemporary feminist theory[74] to increase the effectiveness of policies.

From the interviews carried out during the project it is clear that this negative perception is shared among young women and they do not feel comfortable with the idea of quotas and similar gender policies. Indeed, the girls and women interviewed spoke instead of the benefits of diversity in the workforce.

- Apps developer/young entrepreneur: *"I don't really like those kinds of policies. We value CVs by their quality and gender is not an issue. Women should be interested in the sector by themselves and for what we offer, and that's what we do"*.

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[72] The negative connotation of the term "feminism" has been widely revised by social scientific literature over the last decades. A review of literature in this regard can be found at Burlingame-Lee, L.J (2011) *Attitudes of older adults toward feminism and women's roles: The influence of gender, religious orientation and political orientation*. Bibliobazaar, Llc, 2011.

A recent study relating to the term feminism in the British and German press concludes that "*there is a strong tendency to portray the movement in negative terms. In both corpora, there is a general association of feminism with the past*." (Jaworska & Krishnamurthy 2012).

A negative attitude towards the term is also identified during the interviews carried out for this study and in recent surveys in Europe and the USA.

According to a survey carried out by Netmums, Britain's largest women's website, in 2012, only 14% of British women consider themselves as feminists. Younger women are least likely to embrace the term: just 9% of those aged 25 to 29 identify with the term, and only 8% of women aged 20 to 24. In addition, 25% of women aged 45 to 50 describe themselves as feminists. Similar studies have been carried out in the USA with similar results: a 2013 HuffPost/YouGov poll shows that only 20% of Americans consider themselves feminists, although 82% believe that "men and women should be social, political, and economic equals".

[73] Sources:

- European Commission (2006):
- Valenduc, G., Vendramin, P., Guffens, C., Ponzellini, A., Lebano, A., D'Ouville, L., Collet, I., Wagner, I., Birbaumer, A., Tolar, M. & Webster, J. (2004)

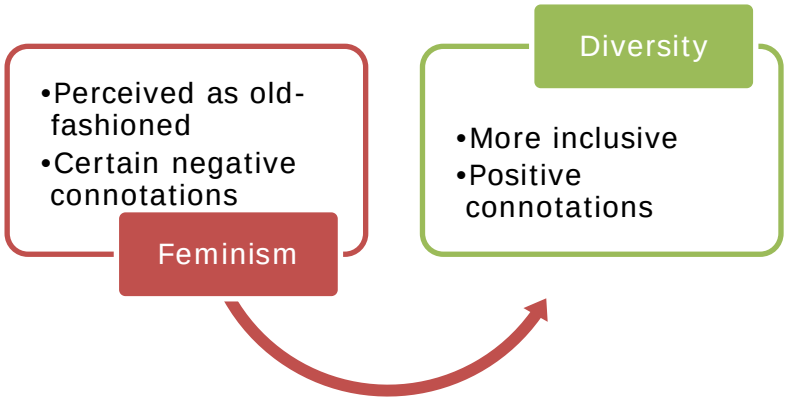
[74] Source: Hankivsky, O. (2005): Gender vs. Diversity Mainstreaming: A Preliminary Examination of the Role and Transformative Potential of Feminist Theory. Canadian Journal of Political Science / Revue canadienne de science politique 38:4. Simon Fraser University.

- Videogames developer/young entrepreneur: "*I like girls contacting me for doing internships, or for asking questions about the company or some of our games. I appreciate that, but I will never hire a girl just for being a girl*".

This is not a new phenomenon, as recognised by Sheryl Sandberg in her book *Lean In: Women, Work, and the Will to Lead*[75]:

It saddens me to admit that we – me and my college friends - *did not see the backlash against women around us. We accepted the negative caricature of a bra-burning, humorless, man-hating feminist. (…) In our defense, my friends and I truly, if naïvely, believed that the world did not need feminists anymore. We mistakenly thought that there was nothing left to fight for.*

Figure 9. Change of approach to the problem



Source: prepared in-house

During the interviews there is a reluctance to recognise that gender has been a barrier, although at some point all of the women interviewed identify certain gender issues which have affected them during their careers. Women do not want to be seen as "weak" and recognise that the fact of being a woman has negative impacts within the sector. As a result, they do not feel comfortable with specific gender policies, and even women entrepreneurs interviewed have not implemented gender policies in their companies.

Some of our interviews with entrepreneurial and recruiting companies also suggest that in many spheres, not making any reference to gender is considered as the best gender policy, as a proof that all actions are gender neutral and that discrimination does not exist.

[75] Source: Sanberg, S. (2013): Lean In: Women, Work, and the Will to Lead. Alfred A. Knopf, New York, USA.

At this point it is fitting to refer once more to the thoughts of Ms Sandberg, who has worked in the ICT sector since 2001 in companies such as Google and Facebook:

But while gender was not openly acknowledged, it was still lurking below the surface. I started to see differences in attitudes toward women. (…) I admitted that I could see these dynamics playing out in the workforce, and that, in order to fix the problems, we needed to be able to talk about gender without people thinking we were crying for help, asking for special treatment, or about to sue.

Since gender problems remain, debate and action is still needed. There are however two different approaches: the first suggests working on the general acceptance of the concept of feminism and the elimination of its negative connotations:

Now I proudly call myself a feminist. (…) I hope more women, and men, will join me in accepting this distinguished label. Semantics can be important, but I don't think progress turns on our willingness to apply a label to ourselves. I do think progress turns on our willingness to speak up about the impact gender has on us. We can no longer pretend that biases do not exist, nor can we talk around them (Sandberg, 2013).

Generally speaking, the term "diversity" could encourage men to participate more in the debate on the gender gap in the sector

The second approach suggests shifting towards other concepts with less negative implications, such as diversity. Although we strongly agree with the need to speak up about gender gaps in the sector, from the interviews conducted during the study, and since this is an old social debate in which little progress has been made in recent years, we suggest a shift towards a new language, more inclusive and with fewer negative connotations. Indeed, this could invigorate the debate within the sector and encourage men to participate more.

General recommendations

1. Change the approach of the issue and focus on diversity: this helps women feel more comfortable with the discussion (especially young women) and encourages men to become involved.

Concrete actions

EC / EU
- Institutional campaign, which targets industry, showing the economic benefits of diversity for enterprises and the risks posed by a shortage of a qualified

workforce.

- Elaborate series of documentaries or conferences with findings from these studies in TED or similar platforms.
- Disseminate data in key publications: business magazines, airlines magazines, economic publications, etc.

- Use an approach focused on diversity in all communication campaigns about gender issues.
- Involve men in all discussions on the topic from a diversity point of view.

Industry

- Change language: shift from gender policies and issues within the company towards the diversity concept.
- Create an open debate within companies about the benefits of diversity and how to increase it, involving men and women.
- Feature diversity as a competitive advantage, since diversity regarding inclusion creates diversity in thought; this can make companies more innovative and creative.

Member States

- Disseminate existing evidence of the economic benefits of diversity in the workforce through mass media.
- Use an approach focused on diversity in all communication campaigns about gender issues.
- Involve men in all discussions on the topic from a diversity point of view.
- Incentivise and promote companies that are examples of best practices.
- Ensure Diversity exists in educational contexts.

3rd Sector

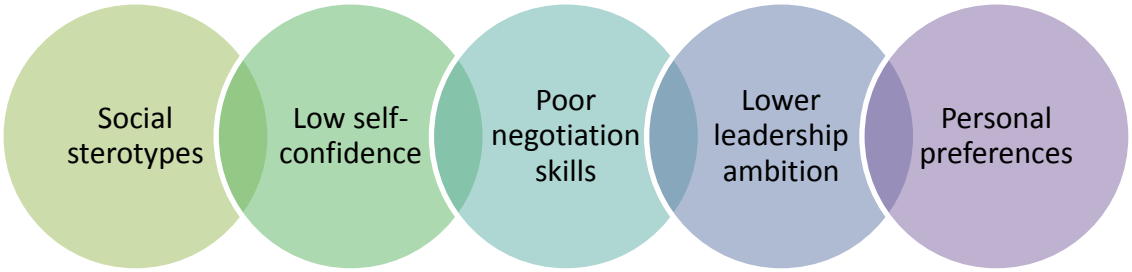
- Disseminate existing evidence of the economic benefits of diversity in the workforce.

PRIORITY 2. EMPOWER WOMEN IN THE SECTOR

The problem

Some psychological and socio-psychological factors have important effects on the labour market outcome, and particularly in very male-dominated sectors such as ICT. These factors include gender differences in risk preferences, in attitudes towards competition, and in attitudes towards negotiation[76]. **The lack of confidence women have in their own capabilities, together with a culture and social environment still dominated by strong preconceptions regarding the appropriate behaviour for men and women,** partially explains these differences.

Figure 10. Factors that limit women's presence in the ICT sector



Source: prepared in-house

These factors play an essential role in the problems which we have identified: women not entering the sector, women leaving the sector, women not achieving leadership positions in the sector or not starting businesses in the sector.

How we identified the problem

The so-called "leadership ambition gap"[77] of women and its causes have been extensively analysed by academic and industry stakeholders, particularly in the last 10 years[78].

***Fear** is at the root of so many of the barriers that women face.* (…)

My argument is that getting rid of these internal barriers is critical to gaining power. Others have argued that women can get to the top only when the institutional barriers are gone. This is the ultimate chicken-and-egg situation. The chicken: Women will tear down the external barriers once

[76] Source: Bertrand, M. (2010)

[77] Source: Sandberg, S. (2013)

[78] See Bertrand, M. for a comprehensive review of research and papers on these topics.

we achieve leadership roles. (…) The egg: We need to eliminate the external barriers to get women into those roles in the first place. (…) They are equally important. I am encouraging women to address the chicken, but I fully support those who are focusing on the egg (Sandberg, 2013).

The **lack of self-confidence** has also been clearly identified during the interviews held for this study:

> *"Women highlight the things they haven't done yet and men highlight the things they can do"*
>
> *(IT Support Director)*

- Videogames developer/young entrepreneur: *"But I have to say that when I started at university I noticed that guys assume that they are always in competition which each other, especially when there are few girls among them. And they often hurt girls because they try to prove how much they know and how much better they are. And that is a little bit intimidating and I thought: "wow, maybe I am not interested or passionate enough". But over time I realised that it was not true, it is just that boys are more competitive, and it doesn't mean that I don't have the same passion, it is just that we have a different way of expressing it. Guys are much more daring especially comparing with girls, who are less confident"*.
- Apps developer/young entrepreneur: "*On the other hand, we need soft skills on technology and in many cases that is the problem with women, that if a girl is not specialised in something she says that she cannot do it or "I'm not good at". Boys always say that they are great at something even if they aren't. So I think it is more an attitude, not a special skill"*.
- IT Support Director: *"However, some female characteristics can be seen in business environment as less effective. Furthermore, women highlight the things they haven't done yet and men highlight the things they can do"*.
- ICT Consultant: *"Women in general are more doubtful when they have to apply for a managing position because they think that they are not able to do it. When I see women like this I tell them: "just do it and you will learn by doing it". So I think that encouraging them is a very big point"*.
- ICT Consultant: *"I don't know if it is a common problem but in Germany I hear mothers saying: "my daughter is not good in sciences". But I think that if you hear this, you will memorise that you are not good in science (…). By hearing it all the time it becomes true, but it shouldn't be this way"*.

Together with self-confidence there are two relevant elements which would need to be included in any action plan: **the attitude of women towards competition and their negotiation skills**. The difficulties

relating to women competing in very male-dominated environments and their lower performance in negotiating (particularly salaries) should be addressed in two ways: first by empowering women to overcome their limitations and better adapt to the requirements of the sector and, secondly, by modifying the "old-boys' network" system[79] which predominates in the sector (this will be reviewed as the next priority).

- Videogames developer/young entrepreneur: *"At the University I had to prove that I was technically better than boys to be considered good. (…) Sometimes I had to stand jokes, and I know that it is a joke but at the same time it is not. But you have to put this behind you and with the time I learnt how to return this kind of comment"*.
- Online Marketing responsible: *"In the past I've sometimes had to deal with individuals that thought as a woman I wouldn't have technical knowledge. I just decided to use that to my benefit when I spotted it"*.
- Former Policymaker: *"Women spend a lot of energy at work, sometimes much more energy than men to prove that they can do the same as men. It is harder because men don't need to prove anything. Women have to prove more to succeed equally"*.
- IT Support Director: *"I observe that many women don't invest enough time in developing and managing their business-related network. Part of career effectiveness is managing the network that is willing to invest in your development, support you on your career journey, sponsor you when required, and give you opportunities. And then it is important to have the courage to take the opportunity when it is offered"*.

Actions should be taken in the sector to empower women to overcome these kinds of limitations which are affecting their entrance, permanence and promotion within the ICT sector.

General recommendations

1. Promote the harmonisation of the educational curricula across Europe (agreed with the industry) thus creating clearer and more straightforward paths to ICT careers, particularly in innovative and emerging sectors such as digital contents (videogames, digital art, etc.) or app development and programming. This will help women to feel more confident about their capabilities for certain positions, thus meaning that they will apply for more jobs in the sector, since women

[79] Source: European Commission (2006)

tend to apply for jobs only when they meet the job description perfectly[80].

Evidence also shows that more innovative study programmes have approximately 10% more women than traditional programmes, whilst engineering study programmes with more than 25% of non-engineering subjects are more attractive to women than traditional engineering study programmes and women have a higher success rate[81].

2. Promote transparency in salary policies and promotions. The sector is characterised by wage policies and promotions based, to a great extent, on individual negotiations, where women seem to focus more on working conditions and personal satisfaction and less on money, which might be influencing the Gender Payment Gap and the "glass ceiling". Two types of measures should be implemented in this regard: first persuade companies to improve transparency in their salary and promotion policies and, second, empower women to improve their negotiation skills.

"Women have this feeling that they earn less than men, even if it is not true"

(ICT Consultant)

- ICT consultant: *"But that could generate negative feelings: maybe you get paid not as well as men in comparable situation. I cannot complain about that because I think I have a good average. But in general women have this feeling that they earn less than men, even if it's not true"*.

3. Improve the confidence of women in their managerial capabilities through training and coaching programmes: this has been proven successful in various case studies[82].

4. Promote mentoring programmes within companies: they have proven to be successful in increasing the promotion chances of women within companies, and therefore, salaries[83].

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[80] Sources:
- Institute of Leadership & Management (2011)
- Desvaux, G., Devillard-Hoellinger, S. & Meaney, M.C. (2008) A Business Case for Women. McKinsey Quarterly.

[81] Source: Centre for Gender Studies. Siauliu Universitetas (2013): HELENA Project (Higher education leading to engineering and scientific careers).

[82] Sources:
- European Commission (2006): Telia Sonera, RTE Ireland, General Electrics France
- European Commission (2010)
- Valenduc, G., Vendramin, P., Guffens, C., Ponzellini, A., Lebano, A., D'Ouville, L., Collet, I., Wagner, I., Birbaumer, A., Tolar, M. & Webster, J. (2004)

[83] The study from Ana Rute Cardoso & Rudolf Winter-Ebmer (2007) "*Mentoring and Segregation: Female-Led Firms and Gender Wage Policies*" confirms that "when female managers are actively mentoring and protecting female co-workers they increase their promotion chances and thus the expected wage for females" in the case of firms where job promotion is an important part of the pay scale, as is the case with the majority of the ICT sector.

5. Outline inventions, developments and innovations coming from women. More visibility of success tangible products or services from women (in the sector) will improve female confidence and might reduce the pressure of women having to show they are technically better than men.

Concrete actions

EC / EU
- Promote a common framework validating ICT and managerial skills acquired in informal settings. - Promote the harmonization of a European educational curricula (agreed with the industry) to create clearer and straighter paths to ICT careers. - Provide visibility of ICT products and services designed or created by women. - Encourage/ sponsor the creation of a website (following the example of http://leanin.org/) led by visible and inspiring European women and men (but orientated towards women) from the sector including useful tools such as: ▪ Debate forum. ▪ Role models (interviews, blogs, articles, etc.). ▪ Professional training and soft skills. ▪ Gateway to ICT training. - Create a centralised data base for ICT CV's from women (high level profiles) to improve visibility of candidates and networking.
Industry
- Create a more narrow relationship with the educational system by: ▪ Creating grant programmes from first years of tertiary education (with minimum participation of women). ▪ Participate in career-orientation programmes at schools. ▪ Design initiatives for girls at school: * Tech camps. * In-site visits to the company. * Awards and competitions. - Implement training and coaching programmes for high-potential personnel segregated by gender[84].

Case studies from the European Commission (2006) also show the success of mentoring programmes when it comes to improving the promotion chances of women.

[84] Various studies show that women tend to perform better in single-sex environments; for example in training environments (European Commission, 2006) and in competitive environments (Gneezy, U.,

- Implement mentoring programmes within the company for women (with senior women and men from the company or the industry).
- Adapt internal training to women's needs:
  - Design flexible training programmes that facilitate balance between work and family life.
  - Guarantee the participation of women in all courses (set minimum quotas), particularly training leading to promotions.
  - Include topics of special interest to women: networking and negotiation skills, strategic planning, etc.
  - Ensure the participation of female training professionals.
- Provide visibility to the company's products and services designed or created by women.

Member States

- Create bridge programmes linking tertiary education institutions with the industry:
  - Mentoring programs at schools[85].
  - Guidance for teachers and career advisors on the need of girls and the sector.
- Revise syllabus to include management, negotiation and entrepreneurial skills designed from the gender perspective.

3rd Sector

- Assist all stakeholders in the previous recommendations by providing advice, contacts, best practices, etc.

Niedeerle, M. & Rustichini, A. (2003): *Performance in competitive environments: gender differences*. Quarterly Journal of Economics, 2003.

[85] Success proven by the case study of Hannover University

PRIORITY 3. INCREASE THE NUMBER OF WOMEN ENTREPRENEURS IN THE ICT SECTOR

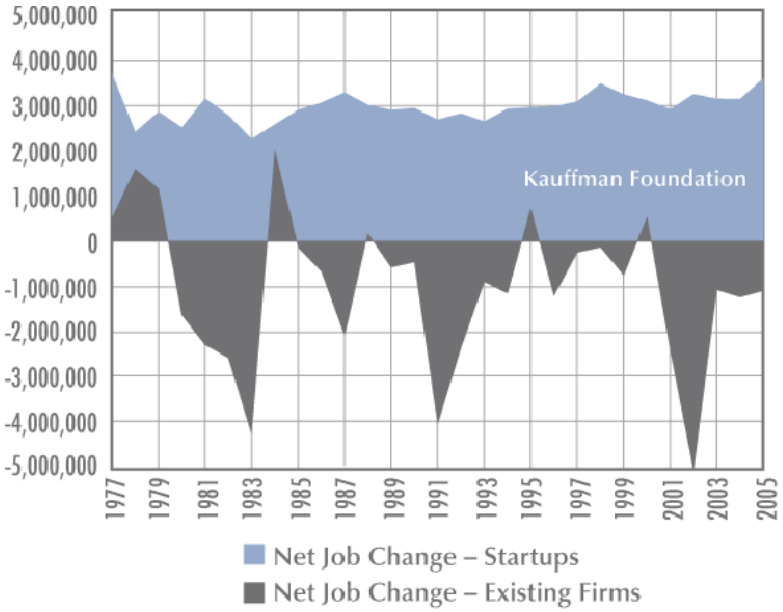
The problem

The number of female entrepreneurs in the ICT sector is less than 20%. Promoting entrepreneurship in Europe, both among men and women, is critical for our economy.

How we identified the problem

According to the Kauffman Foundation report entitled "The Foundation of Entrepreneurship" (2009), since 1980 virtually all net job creation in the United States has come from companies less than five years of old. The following table shows a comparison between job creation by start-ups and existing firm in the US between 1997 and 2005.

Figure 11. Start-ups create most net jobs in the USA



Source: Kauffman Foundation

Data in Europe seconds this fact: during the period spanning 2004-2008, most employment growth is generated by newly born SMEs (up to 5 years old in 2008)[86].

[86] Source: Jan de Kok, P. V., Verhoeven, W. Timmermans, N., Kwaak, T., Snijders, J & Westhof, F. (2011): Do SMEs create more and better jobs? EIM Business & Policy Research. Zoetermeer, The Netherlands.

Figure 12. Net job creation 2004-2020 by age of enterprises in Europe

Table 1 Net job creation 2004-2010 by age group of enterprises that survived

	Number x 1,000,000
Newly born enterprises	17.5
Young enterprises	0.2
Established enterprises	-4.2
Total	13.5

Source: EIM Business & Policy Research

Indeed, this means that Europe needs entrepreneurs, although studies also show that:

- **High-tech companies which women build are more capital-efficient**: venture-backed companies run by a woman have annual revenues which are 12% higher, using an average of one-third less committed capital[87].
- **Women-owned businesses are more likely to survive the transition from raw start-up** to established company than the average[88].

This means that investing more in female entrepreneurs in the ICT sector will improve the bottom-line performance of our economy, and measures for stimulating tech start-ups which are inclusive for women will arouse economic and job growth.

In addition, according to existing studies, women starting up more businesses in ICT:

- Would help to reduce the gender payment gap[89] in the sector.
- Would increase the promotion opportunities for women in these companies[90].

With one of our economic cases we intend to gather further evidence on these facts in Europe, since most existing studies come from the US.

We find that **the gender payment gap for entrepreneurs is in fact lower**[91]**:**

[87] Source: Padnos, C. (2010): High Performance Entrepreneurs: Women in High Tech. Illuminate Ventures

[88] Ibid.

[89] Source: Bell, L.A. (2005): Women-Led Firms and the Gender Gap in top Executive Job. Discussion Paper No. 1689. IZA Institute for the Study of Labor

[90] Source: Cardoso, A.R. & Winter-Ebmer, R. (2007)

[91] Data elaborated for this study from the Survey on Working Conditions 2010. ICT sector refers to the NACE Rev. 2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1). Under the non-

- Entrepreneurs in ICT: women earn 88% of the wage men earn, thus meaning that the unadjusted gap is 12%.
- Non-Entrepreneurs in ICT: women earn 76% of the wage men earn, and as such the unadjusted gap is 24% (we have seen that for the sector as a whole, including all workers, this figure stands at 21%).
- Non-ICT entrepreneurs: women earn 82% of the wage men earn, meaning that the unadjusted gap is 18%.

Although the gap (unadjusted) is lower than for other workers in the sector, since the adjusted GPD for the sector is 0%, it could be expected that for entrepreneurs it should also be close to 0%, since it compares similar positions within the sector. The explanation for this gap can be found in the size of companies. We can see that in the ICT sector females tend to be self-employed with no employees (80.8 % of women entrepreneurs in the sector have no employees compared to 71.8% of men[92]). This can help explain the lower level of wages, because female entrepreneurs work in very small firms, and size of firm is positively correlated with wages.

As a result it would be very important to implement support strategies so as women's start-ups in the sector are able to grow and expand.

We now focus on the influence which women in managerial positions have on other women in the sector. Existing research[93] suggests that women in senior positions tend to reduce the GPG. However, when looking to female workers in the sector with women bosses we see in our economic case that[94]:

- Having a female boss (in the ICT sector) does not have any significant effect on average wages for either males or females.
- Having a female boss (in the ICT sector) decreases the percentage of females who report being very satisfied overall in their job.
- Having a female boss in other non-ICT sectors does not affect either the satisfaction or wages of female employees.

Hence, these results suggest that female bosses in the ICT sector behave differently than in other non-ICT sectors, probably because this is a much more masculinised sector. Therefore, a greater participation of women in the sector should normalise these indicators.

ICT Service Sector we include the following sectoral activities: K, L, M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N, O, P, Q and S.

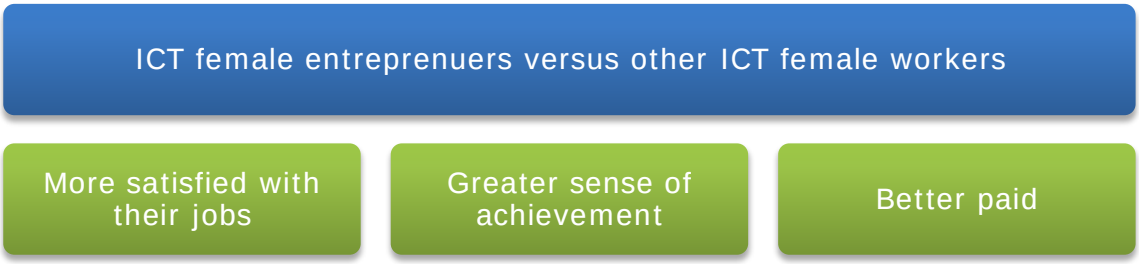
[92] Data from the European Labour Force Survey (2011) for the NACE Rev. 2 J sector.

[93] See footnote 37.

[94] Data elaborated for this study from the Survey on Working Conditions 2010. ICT sector refers to the NACE Rev. 2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1). Under the non-ICT Service Sector we include the following sectoral activities: K, L, M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N, O, P, Q and S.

What is clearly seen in our economic case is that **women entrepreneurs in the ICT sector are, on the whole, more satisfied with their jobs**, **have a greater sense of achievement following well-executed work, and are better paid than other workers in the sector**. This provides a great argument to encourage young women to create new ICT businesses. On the negative side, they do experience more stress.

Figure 13. Arguments to encourage female entrepreneurs



Source: prepared in-house

General recommendations

As a result of the issues outlined above, together with measures for empowering women within the sector by providing them with the right tools and skills, specific strategies should be implemented to encourage entrepreneurship in the ICT sector among women.

1. Improve access to funding, particularly seed and venture capital programmes.
2. Promote the idea of entrepreneurship in the sector as easier than in other sectors: programming or designing can be done from a PC anywhere! Use role models for this aim.
    - Apps developer/young: *"One of the co-founders found a summer job in Sweden developing applications. When his term was finished the guy of the enterprise in which he was hired ask him if he could outsource a project, and he needed help to work on it. He suggested me and two other colleagues to join him and we asked for a European grant (5.000 €) and that is how everything started. We just thought "let's try, if it works it is ok, if it doesn't we have like 'another adventure' and we come back to study". We didn't need much funding because we were students living with our parents and we were programming from home. We didn't need much structure"*.

Concrete actions

EC / EU
- Establish a common framework validating ICT and managerial skills acquired in informal settings for entrepreneurship skills. - Create a communication campaign targeting girls with role models featuring young European entrepreneurs in the sector. - Improve the visibility of social entrepreneurs in ICT. - Enhance regulation favouring entrepreneurs in the sector e.g. tax exemptions and smart regulation (reduction of administrative burdens).
Industry
- Create specific capital seed programmes for female entrepreneurs in the sector. - Create a crowd-funding platform to help female entrepreneurs get funding for their businesses. - Include in the selection of providers at least one offer from a female entrepreneur. - Include in EU tendering: "Women entrepreneurs are particularly encouraged to submit tenders".
Member States
- Create specific funds for women entrepreneurs in ICT. - Support business angels who assist women entrepreneurs. - Revise the regulatory framework to favour entrepreneurs and reduce administrative burdens in the sector. - Include in syllabuses entrepreneurship skills designed taking into account the gender perspective.
3rd Sector
- Create specific programmes for social entrepreneurship for women in ICT in partnership with the European industry, following the example of programmes such as the "Changemakers".

PRIORITY 4. IMPROVE WORKING CONDITIONS IN THE SECTOR

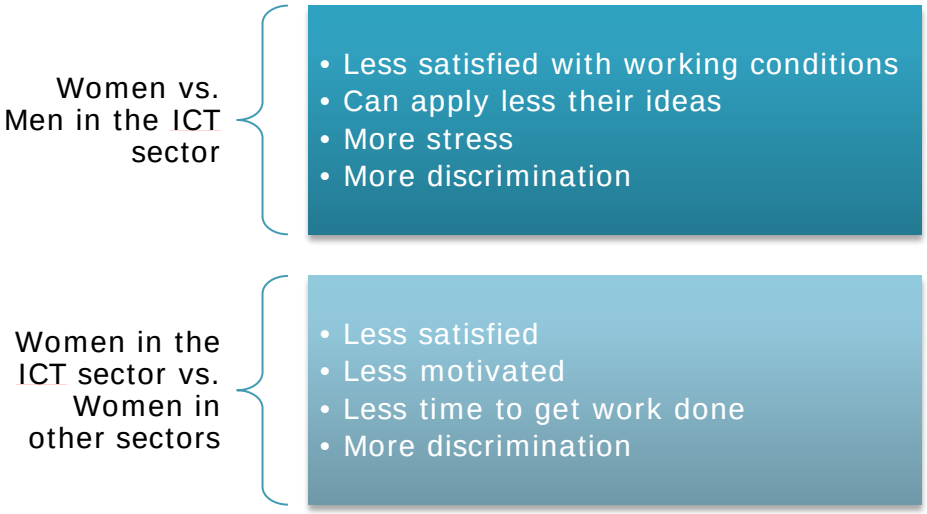
The problem

There are two main problems in the sector affecting the working conditions of women: the first problem involves informal rules in the sector (the so called “old-boys' network system”) - this is not unique to the ICT sector, but has a greater impact on very male-dominated sectors such as this one. The second problem relates to formal working conditions such as working hours and schedules.

How we identified the problem

All of the women we interview for this study are either satisfied or very satisfied with their work in the ICT sector, and have never thought of leaving the sector. That said, the literature review, case studies and findings from our economic cases prove that **working conditions in the ICT sector are among the root causes for the low number of women working in the sector,** and represent one of the main reasons why women may abandon the sector.

Figure 14. Perceptions on working conditions



Source: prepared in-house based on data from Survey on Working Conditions (2010)

From our economic case 2[95] we find that women in the ICT sector generally feel less satisfied than men in the ICT sector and women in other non-ICT service sectors:

[95] Data elaborated for this study from the Survey on Working Conditions 2010. ICT sector refers to the NACE Rev. 2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1). Under the non-

- Women in the ICT sector are less satisfied with the overall working conditions in their main paid job, and feel they cannot apply their own ideas in their work as much as their male counterparts. They feel more stress than their male counterparts in their job and feel more discrimination on the basis of their sex.
- Women in the ICT sector feel less satisfied in their main job, feel less at home in their organisation, and feel less motivation from their organisation than their female counterparts in the non-ICT sectors. Furthermore, women in the ICT sector feel they have less time to get their work done than their counterparts in the non ICT sector and finally, they feel more discrimination on the basis of their sex than their counterparts in the non-ICT sectors.

Table 5. Perceptions on working conditions in the ICT and in the non-ICT services sector

	ICT	*non-ICT Services*
***On the whole, how satisfied are you with working conditions in your main paid job?* (1= positive)**		
Female	0.82	0.85
Male	0.89	0.86
***I feel 'at home' in this organisation* (1=agree)**		
Female	0.66	0.75
Male	0.77	0.73
***The organisation I work for motivates me to give my best job performance* (1=agree)**		
Female	0.64	0.66
Male	0.65	0.65
***You are able to apply your own ideas in your work* (1=agree)**		
Female	0.55	0.72
Male	0.78	0.74
***Your immediate manager/supervisor encourages you to participate in important decisions* (1=agree)**		
Female	0.69	0.76
Male	0.78	0.78
***You have enough time to get the job done* (1=agree)**		
Female	0.66	0.76
Male	0.76	0.78

ICT Service Sector we include the following sectoral activities: K, L, M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N, O, P, Q and S.

***You experience stress in your work* (1=agree)**			
Female	0.27	0.27	
Male	0.23	0.26	
***Have you experienced discrimination on the basis of your sex?* (1=agree)**			
Female	0.07	0.02	
Male	0.00	0.01	

Source: prepared in house based on data from Survey on Working Conditions (2010)

Existing research suggests than some of the sector's main problems regarding working conditions are:

- Long working hours.
- Working out of normal working hours (nights, weekends, etc.).
- Difficulties keeping skills updated.
- Strongly male dominated environment in the sector and discrimination: "old-boys' network" system.
- Prejudices in the sector about women's capabilities.
- Discrimination.

Most of these factors have also been identified by interviewed women:

- IT Systems administrator: "*In my opinion, in the ICT sector there is a kind of lack of trust in women. I believe that this is because this is a, more or less, male-dominated sector. When I started working I was surrounded by men and I had to prove that I was as good as men in achieving the goals set by the upper management. I think that this issue has changed now. But there is a lack of trust in the technical abilities of women in the companies. Women have to prove that they can do the same work that men can do"*.
- Videogames developer/young entrepreneur: *"I really believe that the industry is very tough and I also think that there are personalities that can't handle it"*.
- Network Engineer: *"Normally it is supposed that a man technician is more prepared or maybe bosses decided to promoted men because they thought that if they have to be 8 or 10 hours working they are not going to have problems and a women will have"*.
- Network Engineer: "*This job has the normal requests of working by projects and sometimes it is complicated, it depends on the project. Achieving deadlines and milestones requires that you have to be*

available out of normal working hours (Systems work 24 hours), plus we travel a lot".

- IT Systems administrator: "*This is the difficult part. In the ICT sector you have always to move forward. However it is different in the public sector where leaves are longer and pressure is lower. But you have to work long hours in ICT, especially if you work with machines because they can be down at any time, and you have to be there to solve the problem"*.
- IT Support Director: *"Barriers we've observed include lack of role models, limited gender specific networking opportunities, as well as the investment you need to make to remain up-to-date in this fast-moving industry; constantly updating your technical skills to stay current"*.

"You need to make a great investment to remain up-to-date in this fast-moving industry"

(IT Support Director)

- Network Engineer: *"The technological world evolves very quickly and you have to be self-learning all the time"*.

Although the high potential of the sector to become leader in gender equality was already pointed out years ago[96], the same problems seem to be still affecting women today.

Reconciling family and professional life is still one major problem.

- HR manager: *"We are working in reconciliation of professional and personal life. But not just for women because we think it is a big issue also for men from the new generations. It is not only the women who want to work part time or want to have more flexible working hours. Men are not willing anymore to work as many hours as they used to work in the past"*.

Although reconciling family and professional life is a matter which affects both men and women, evidence shows that maternity remains an essential factor in determining a woman's career in the ICT sector. Results from our economic cases show that women find more difficulties in arranging their time schedule for family matters than their male counterparts in the sector, due to the fact that European women spend three times longer than men taking care of their children[97]. Maternity is also the time when more women tend to leave the sector, and is therefore a determining factor when it comes to the leaky pipeline:

[96] European Commission, 2006: Even though the literature highlights a variety of obstacles and barriers to women's progression in the ICT sector, it has also shown that this sector has great potential for realising gender equality, as it is based on new and emerging labour relations (non-traditional sector) and in urgent need of highly qualified personnel.

[97] Source: European Institute for Gender Equality (2011): Review of the Implementation of the Beijing Platform for Action in the area F: Women and the Economy. Reconciliation of Work and Family Life as a Condition of Equal Participation in the Labour Market. Luxemburg.

- HR manager: *"We consider very important to be keep in touch with women during the maternity leave because we do see that this is the time when we lose them: they take the maternity leave and they don't come back"*.

Women with children participate in the labour market in Europe 12.1% less than women without children, while fathers participate 8.7% more than men without children[98].

In addition, evidence from our existing studies show that women under 30 are much less likely to acknowledge that gender has hindered their career[99]. It should be noted that the average age in Europe at which women have their first child is 29.8[100]. This evidence suggests that woman either now enjoy better conditions and are treated more equally, or that younger women have not yet experienced discrimination or problems with balancing work and family life. However, interviews with young women in the sector support the second option:

- Apps developer/young entrepreneur: *"I work a lot, but I think in the future -when I have children- it will change because the balance and the focus will be different. Balance will be difficult but possible because it's my passion"*.
- ICT consultant: *"I think there are many unconscious things people just assume, like that many things change when you have children. And even women who haven't children yet probably assume that the day that they have children they will not take that serious the fact of having a career"*.

Maternity is still the turning point of women's careers in the sector. Since the sector is a very fast-changing environment women fear of lagging behind if they get pregnant and their managers fear the possible inconvenience of the leave and maternity in general (as well as the fear of losing them because they don't come back to their jobs). Our research suggests that those fears should be dismissed because the impact of maternity is in practice less relevant than generally believed.

- IT Support Director: *"At first – during my maternity leave- I was scared of being out and losing contact. But things move on but they don't move on so much. Sometimes it is more about the pressure we put on ourselves. The important thing is that women who take maternity leave return"*.

> *"Sometimes it is more about the pressure we put on ourselves than the real problems derived from maternity"*
>
> *(IT Support Director)*

[98] Source: European Commission (2012): Commission Staff Working Document: Progress on equality between women and men in 2011. 16.4.2012 SWD(2012) 85 final. Brussels.

[99] Institute of Leadership & Management (2011): The percentage of women who believe that gender has hindered their career progression doubles from 20% of under 30s to 44% of over 45s. pp.5.

[100] Source: Eurostat (2012): Fertility statistics. Data extracted on March 2013.

If the industry wants to attract and retain female talent, it has to rethink the way in which it addresses women and the working conditions, particularly in relation to balance family and professional life.

General recommendations

1. Make high-impact campaigns based on the existing economic data regarding the improved performance of companies with women (and a diverse workforce), the foreseeable lack of qualified workers in the future, and reinforce the idea of women having the same technical capabilities as men.

   The inclusion of women in top positions in the sector has a double positive impact:

   - For the whole economy, since evidence proves that organisations which are the most inclusive of women in top management achieve 35% higher ROE and 34% better total return to shareholders[101].
   - For other women. This is because evidence shows that it reduces GPG, since females enjoy higher wages in female-led firms and have more chances of promotion[102].

2. Companies should "speak female language": to become more attractive to women, they must focus their efforts on the aspects which women value the most (work-life balance, personal fulfilment, etc.). To retain female talent, companies must have in mind their needs, and make clear what the job entails by revising the language used in communications; the images used internally and externally, the design of activities, etc.

3. Reform the Code of Best Practices on Women and ICT in the shape of a label:

   - Create clearer objectives and a monitoring system.
   - Clarify the membership and make various categories or branches with specific objectives and differentiated criteria: private companies, NGOs, networks, etc.

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[101] Source: Padnos, C. (2010). Other studies showing the improved performance of companies with women in high positions are:

- *Catalyst (2007): The Bottom Line: Corporate performance and women's representation on boards. New York, USA* http://www.catalyst.org/publication/200/the-bottom-line-corporate-performance-and-womens-representation-on-boards
- *McKinsey & Company (2007): Women Matter: Gender diversity, a corporate performance drive. France* http://www.mckinsey.com/locations/swiss/news_publications/pdf/women_matter_english.pdf
- *Credit Suisse Research Institute (2012): Gender Diversity and the Impact on Corporate Performance. Credit Suisse Research Institute publications. Zurich, Switzerland.* https://infocus.credit-suisse.com/data/_product_documents/_shop/360145/csri_gender_diversity_and_corporate_performance.pdf

[102] Source: Cardoso, A.R. & Winter-Ebmer, R. (2007)

- Advertise and give visibility to complying entities.
- Improve visibility of the label within signatories and outside organisations which are potential applicants.
- The label management should be centralised with a clear contact unit or person, so there is a clear head of the label and a monitoring unit.

4. Initiatives like the **'Global Board Ready Women'** from European business schools[103] would help to stop companies giving "excuses" such as "there are not enough qualified women for this position", particularly for managerial positions.
5. Make work truly flexible: promote flexible working hours and telework.
6. Implement "keep in touch" policies during maternity leave (the time when more women leave the sector): this would improve the confidence of women and the vision of their managers and colleagues.
7. Create more measures to promote paternity leave, and facilitate the division of child-raising responsibilities.
8. Design information campaigns to "loose" fear of maternity leave: both women and managers (and colleagues...).
9. Case studies have shown that childcare facilities always improve reconciling work and a family: either within companies or very accessible, nearby public facilities.

Concrete actions

EC / EU
- Create an "ICT diverse workforce" label (reform of the Code of Best Practices) that requires annual monitoring to be kept: ▪ Create clearer objectives and indicators and a monitoring system. ▪ Clarify the signatories and make various "sections" or branches with specific objectives and measures: private companies, NGOs, networks, etc. ▪ Advertise complying entities. ▪ Improve visibility of the signatories within and out of the organisations. ▪ The label's management should be centralized, with a clear contact

[103] Source: European Commission (2012): *Shattering myths and glass ceilings: launch of database of 'Global Board Ready Women'*
http://europa.eu/rapid/press-release_IP-12-1358_en.htm

unit or person.

- Promote creating favourable conditions for childcare facilities for children under 3 years of age.
- Encourage Member States to enhance flexible working arrangements.
- Promote paternity leave through communication campaigns.

Industry

- Implement transparent recruiting policies, such as:
  - Use of anonymous CVs[104].
  - Quotas in candidates (include a minimum number of women among final candidates for a position).
- Implement transparent promotion policies.
- Increase the number of visible women from the company: public presentations and events, training, etc.
- Design specific programmes and "keep in touch" policies for parents during maternity and paternity leaves.
- Create communication campaigns within companies to inform on the paternity policies and benefits.
- Enhance flexible working arrangements.

Member States

- Improve access to affordable child care facilities by facilitating funding (grants, tax, reductions, etc.) and facilitate the procedure of establishing company kindergartens and nurseries.
- Legislate to promote the use of paternity leave.
- Improve the regulatory framework to enhance flexible working arrangements.
- Establish quotas on candidates for PhDs at technology universities and research institutions (following German case).

3rd Sector

- Create an annual survey of "Best European place to work for women in ICT".

[104] Scientific experiments and studies suggest that sex-biased hiring is still an important barrier for women entering certain occupations and that anonymous hiring procedures foster impartiality in hiring and will increase the proportion of women. Some evidences can be found at:

- Moss-Racusina, C., Dovidiob, F., Brescollc,V.L., Grahama, M.J. & Handelsmana, J. (2012): Science faculty's subtle gender biases favor male students. Princeton University, Princeton, New Jersey, USA.
- Goldin, C. & Rouse, C. (2000): Orchestrating Impartiality: The Impact of "lond" Auditions on Female Musicians. The American Economic Review. Vol 90. No. 4 pp. 715-741.

TRANSVERSAL ACTIONS

TRANSVERSAL ACTION 1. IMPROVE DATA AVAILABILITY

The problem

There is a lack of available data when it comes to gaining a complete overview of European Women in the ICT sector. A comprehensive monitoring of the measures set up cannot be properly implemented without specific statistics on this issue. This lack of data is especially worrying in the case of women researchers in the sector (number of patents, number of women head of departments in universities) and women in managerial positions in ICT companies. Indeed, these two categories are very important in order to determine the current situation of women in the sector.

How we identified the problem

The gathering of information for the elaboration of this study has faced difficulties with regards to finding certain statistics relating to women in the ICT sector. The most remarkable of these difficulties include:

- Lack of adequate data on wages for the most representative database for labour issues, which is the European Labour Force Survey. Some information is provided on deciles (INCDECIL) [105] but this is insufficient to conduct any sensible and complete study on wage differential in the ICT sector.
- Lack of adequate data on the history of individuals. With either retrospective or panel data we might be able to access deeper knowledge regarding the labour history of each individual and learn more about their trajectory. For instance, we know nothing about those females who quit the ICT sector, nor are we aware of the reasons for their departure.
- Lack of data about women in managerial positions in ICT companies. It would be very beneficial to have data not only relating to the percentage of females in managerial positions in ICT companies, but also microdata on the characteristics of these women (age, tenure in the firm, wages, characteristics of the firm, etc.) in order to compare their situation with their male counterparts.
- Lack of data regarding ICT related patents developed by women – number of patents and details about them.
- Lack of data regarding female researchers in ICT related University Departments. It would be useful to have information not only on the

[105] Decile is a statistical term which refers to each of the 10 parts into which a sample or population is divided. INCDECIL is a variable, mandatory in the European Union since 2009, which presents the salary of workers on income deciles.

number of female heads of ICT related Departments, but also on their CV details, particularly on the number and quality of their publications, as well as the number and details of female researchers head of research projects from competitive sources.

- Problems related to setting the ICT sector in the statistics provided by the Labour Force Survey, since the Economic Activity variable is not always disaggregated at the necessary level.
- Lack of data regarding on-the-job training provided by ICT companies to their male and female employees.
- Lack of data disaggregated by gender among recruitment companies.

Annex X includes a revision of existing data bases on selected indicators regarding women and ICT in Europe and the gaps found.

General recommendations

1. Improve the availability and visibility of data in general and facilitate exchange of information: among public entities and their departments, research institutions, private companies, NGOs, etc.
2. Encourage data gathering by intermediaries such as recruiting companies to improve "objective" data on recruiting policies.

Concrete actions

EU / EC
- Consider adding women-related indicators to the Digital Agenda Scoreboard. - Encourage EUROSTAT to include new statistics about women in ICT: ▪ Better information on Wages. ▪ Retrospective information or panel data for previous situation of workers in the labour market. ▪ Women in managerial positions. ▪ Patents. ▪ Women head of ICT departments. ▪ Women entrepreneurs in the sector. ▪ Provided training for women employees in the sector.
Industry
- Gathering data about women in the sector, especially: ▪ Number of women working in the sector. ▪ Number of women taking training.

▪ Number of women participating in networking and mentoring programmes set up by the companies. ▪ Number of employees who enjoy childcare facilities. ▪ Number of employees with a flexible schedule.
Member States
- Coordinate with EC the elaboration of new statistics.
3rd sector
- Facilitate the availably of existing data to the scientific community. - Facilitate the exchange of information with public authorities and the private sector.

TRANSVERSAL ACTION 2: IDENTIFY AND EXCHANGE BEST PRACTICES

As part of our research, cases are being studied in order to identify best practices in three areas:

- Initiatives launched by organisations from the sector to increase the number of women among their workforce and reduce the leaky pipeline.
- Initiatives encouraging social change and/or enhancing the interest of girls in ICT.
- Initiatives empowering women in the ICT sector.

The analysis of cases helps to identify drivers for success and barriers, including regulation or environmental factors, from which lessons might be extracted.

From our analysis, the following general recommendations have been derived:

- Best practices should be analysed and publicised on a continuous basis at the European and national levels. An annual award praising the best initiatives should be established. Awards should be designed for at least the following areas:
    - Best 3rd sector initiative.
    - Best industry initiative.
    - Best public or governmental initiative: political commitment has proven to be a main driver for change.
- Best practices and case studies should be monitored in the mid-term in order to truly analyse its impacts and identify areas of improvement.

- The European Commission should support existing initiatives, providing visibility and support to the most successful ones and scaling them up.
- A mechanism for the more effective exchange of scalable and replicable best practices should be implemented;
    - The reform of the Code of Best Practices (the Label proposed) should include mechanisms to provide visibility of organisations with best practices and providing support for organisations willing to replicate them in an easy and effective way.
- Becoming a best practice in Europe should be truly attractive for all industry organisations, and therefore rewards should be put in place.
- Dissemination activities should not exclusively target women; men should be involved in all actions. The increase of women's participation in general activities of the industry (congresses, events, workshops, etc.) should be preferred over the organisation of specific events only for women.

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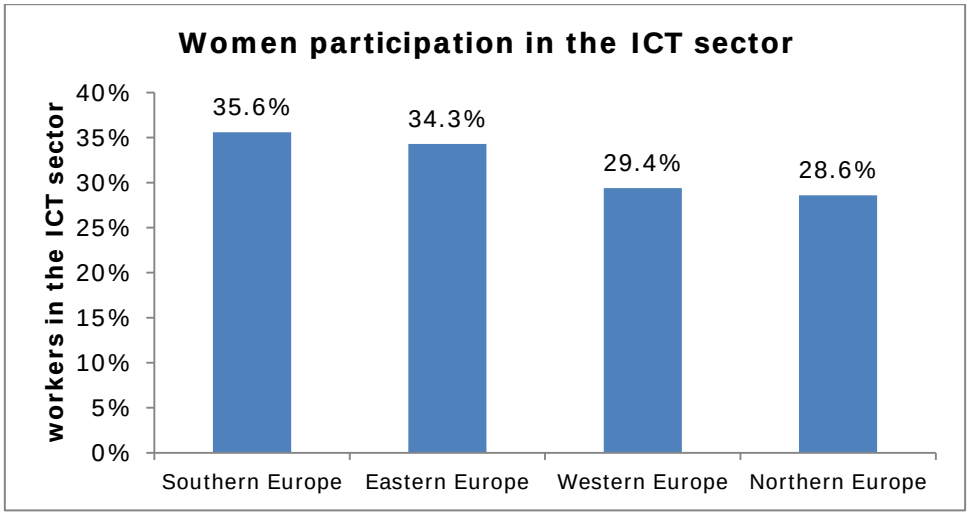
ANNEX I. GEOGRAPHICAL ANALYSIS

The economic cases carried out for this study have allowed for the development of a comparative analysis of the gender gap in the ICT sector among European regions. The most relevant findings from this analysis are:

- Female participation in the ICT sector is higher in Southern (35.6%) and Eastern Europe (34.3%) than in Western (29, 4%) and Northern countries (28.6%)[106].
- Working conditions in the ICT sector for women are, generally speaking, worst for women in Eastern European countries, and best for Northern European countries, with the exception of[107]:
  - Unadjusted Gender Payment Gap: the biggest difference is in Western and Southern Europe, where the female to male ratio is 0.78. The smallest difference is observed in Northern Europe, where the ratio rises to 0.89.
  - Discrimination: the largest difference is found in Western Europe, with 10.9% of women having experienced discrimination on the basis of sex whilst this stands at only 0.5% for men. The smallest is in Southern Europe, with 4.7% of women experiencing discrimination compared to only 0.7% of men[108].

Figure 15. Women participation in the ICT sector



Source: prepared in-house based on European Survey on Working Conditions (2010)[109]

106 Source: European Survey on Working Conditions 2010

107 Ibid

108 The ESWC reflects perceptions of workers regarding the various topics. It should be noted that social and cultural factors might influence differences in attitudes and awareness of discrimination. As a result it might be the case that what is considered discrimination in one country is socially accepted in another.

109 Southern Europe: Southern: Greece, Spain, Italy, Malta, Portugal, Slovenia

Explanations for the existing differences among countries in Europe could come from institutional factors (legislation and social policies), economic factors (labour markets) or social and cultural factors (traditions, history, etc.).

During our study we have found **two main types of factors: institutional and cultural**.

Existing case studies show that in many cases legislation has been the driver of change and has allowed for the implementation of gender policies in private and public companies and organisations. This is the case in both Germany and Sweden[110].

However, **historical and cultural issues** still seem to represent the predominant reason for variations across Europe.

For example, the socialist era has left a powerful imprint on Central and Eastern European countries, particularly with regards to the inclusion of women in the labour market:

*In fact, state socialist societies have gone further than most Western welfare states in expanding the female role beyond that of a family caregiver, encouraging women to join the labour force, become economically independent, and participate in society outside the private sphere. However, social policy goals have been inclined primarily to satisfy the extensive demand for labour, while ideas about women's emancipation have played a subordinate role (*Schmitt, C. & Trappe, H., 2010)[111]*.*

This legacy helps explain why the participation of women in the ICT sector in Eastern European countries is higher than in Western and Northern countries, although general satisfaction with working conditions is lower.

- Former Policymaker: *"Sometimes your opponents are not taking you seriously enough. (...) And this is even worse in ICT because there are not a lot of women. I see this more when I'm in international environments, with people from Western Europe. I think that here in Latvia there is more gender equity"*.

On the other side, particularly during the 50s and the 60s, conservative Western states were encouraging a traditional division of labour based on a male breadwinner and a female homemaker[112].

Eastern Europe: Bulgaria, Hungary, Poland, Romania, Slovakia (Czech Republic not included in the original data sources)

Western Europe: Belgium, Germany, France, Luxembourg, Netherlands, Austria, Switzerland

Northern Europe: Northern: Denmark, Estonia, Ireland, Latvia, Lithuania, Finland, Sweden, UK

[110] European Commission (2006): Best practices for even gender distribution in the 25 member states in the domain of Information Society.

[111] Schmitt, C. & Trappe, H. (2010): Introduction to the special issue: Gender relations in Central and Eastern Europe – Change or continuity? Zeitschrift für Familienforschung, 22. Jahrg., 2010, Heft 3 – Journal of Family Research

[112] Ibid

As a result, in certain countries in Europe, strong ideas about motherhood and gender role attitudes remain.

These stereotypes and preconceived ideas have an important effect on the ICT sector.

- ICT consultant: *"They (the girls) usually choose other paths after school and I don't know if it is a common problem but in Germany I hear mothers saying: "my daughter is not good in natural sciences". But I think that if you hear that you are not good in natural science you will memorise that you are not good in natural science. But that seems good for them because they are normal women. By hearing it all the time it becomes true, but it shouldn't be this way"*.
- HR manager: *"It is especially hard in Germany to find candidate girls for our job offers, particularly the more technical ones. It is easier in India or in the US"*.

Another relevant feature which can have an important effect on the entrance of women in the ICT sector is the nature of scientific and technical higher education studies in each Member State.

A recently concluded study, funded under the 7th Framework Programme, HELENA Project (Higher education leading to engineering and scientific careers) finds that study programmes with more than 25% of non-engineering subjects have more female students and have more female graduates. The HELENA research sample focuses on the engineering degree courses, at bachelor or master level. Indeed, the aim is to compare 'traditional' degree courses and 'innovative' degree courses. 'Innovative' is defined as interdisciplinary degree courses where 25% or more of the total number of ECTS are in non-engineering disciplines[113].

"If I would have stayed in my country I would have never become a game developer because technical studies are very traditional"

(Videogames developer and entrepreneur)

With this in mind, the design of curricula of ICT-related studies in every country could therefore play an important role when it comes to the preferences of girls as they choose a degree.

This is also identified during interviews:

- Videogames developer/young entrepreneur: *"I am from Macedonia and there it wouldn't have been possible to study this because the technical studies are very traditional, but I moved to Denmark and I realised that this is possible. (...) Being in Denmark was a key factor for me finally becoming a game developer"*.

[113] http://www.fp7-helena.org/

ANNEX II. ECONOMIC CASES

Methodology for the Economic Cases

Economic Case 1:

In Economic Case 1 we present only descriptive differences with regards to percentages of males and females who after having studied in fields related to ICT topics, either do not work at all, or do work but not in ICT-related jobs. For this we simply present weighted wage gaps, where weights reflect the representativeness of each individual in the whole population.

Economic Cases 2 and 3:

In these two economic cases, in addition to presenting descriptive differences in gender with respect to job conditions – and again we weight all descriptive gender gaps by the representativeness of each individual in the whole population - we also estimate a different set of job conditions for men and women working in the ICT sector. The methodology we have followed for these estimations is as follows:

For the estimation of job conditions such as satisfaction, flexibility, stress, feeling of discrimination, which we have considered as binary variables (1 or zero), we select men and women working in the ICT sector and estimate each of the work condition variables selected above on a set of controls – age, educational level etc. In addition, as an indicator for females, given that the dependent variables are discrete, we use Maximum Likelihood estimations, in particular logic models. The coefficient of the female indicator reveals whether gender differences persist when we compare similar men and women in terms of the included controls.

In addition, we report odd-ratios: A value of 1 (or not significantly different from 1) would reveal no gender difference in the estimated variable. A smaller value would reflect a lower position of women with respect to men.

However, for the estimation of wages, we use the standard Ordinary Least Square Estimator. As the number of observations, particularly for some of the groups of countries, is very low, we have estimated all countries together in the estimation, although indicators for each of the four groups are also included as controls.

Economic Case 1. Gender Gaps in Education and Work

Introduction

For Economic case 1, the main idea is to compute different gender gaps with regards to understanding the mechanism “from education to work” for those individuals who choose educational fields related to the ICT sector. In order to examine this issue thoroughly, we use the latest wave available (2011) from the European Labour Force Survey, which is by far the most

representative sample of European Countries and contains complete and detailed demographic and labour market information for individuals from the 27 Member State of the European Union[114].

The first stage is to select those individuals who choose educational fields more oriented towards future work in the ICT sector. With this aim, the following educational fields are selected:

a) Physical Sciences (441 in Eurostat Codes).

b) Mathematics and Statistics (46, 461 and 462 in Eurostat Codes).

c) Computing (48, 481 and 482 in Eurostat Code).

d) Engineering and Engineering Trades (52, 521, 522, 523 and 524 in Eurostat Codes).

The first thing to note when looking at individuals who have selected these educational fields is that the highest educational level attained varies to a large extent across those individuals who have selected these types of studies. Table 6 presents, for all countries together as well as for 4 groups of European Countries (Western, Eastern, Northern and Southern)[115] the distribution of individuals who undertake these selected fields by the highest educational level attained.

Table 6. Percentage of Individuals who undertake education in Maths, Statistics, Computing and Engineering by level of Education (2011)

	Average among all 26 Countries	Western Europe	Eastern Europe	Northern Europe	Southern Europe
Upper Secondary	67.03%	28.06%	82.25%	35.37%	29.83%
Post Secondary	5.66%	4.31%	3.3%	12.32%	18.3%
University	26.42%	64.36%	14.28%	50.19%	49.56%
More than university	0.89%	3.26%	0.18%	2.12%	2.3%
Total	100%	100%	100%	100%	100%

[114] At the moment, the LFS microdata for scientific purposes contain data for 27 Member States and in addition Iceland, Norway and Switzerland. Microdata from 2011 necessary for this study is not available for Cyprus and the Czech Republic, therefore 25 countries from EU27 have been included, together with Switzerland, making 26 in total.

[115] The distribution of countries among regions is the following:

- Western: Belgium, Germany, France, Luxembourg, Netherlands, Austria, Switzerland
- Eastern: Bulgaria, Hungary, Poland, Romania, Slovakia (Czech Republic not included in the original data sources)
- Northern: Denmark, Estonia, Ireland, Latvia, Lithuania, Finland, Sweden, UK
- Southern: Greece, Spain, Italy, Malta, Portugal, Slovenia

As is evident from the table, on average 67% of individuals who select these studies only attain upper secondary education. However, this percentage varies widely across groups of countries. In particular, it seems to be very common in Eastern Europe but less in Western and Southern Europe. Second, a small percentage of individuals who undertake these fields seem to have either post-secondary education or more than college. Hence, we will group individuals in two educational levels: (i) Non-College, and (ii) College. Results will be present for the two groups of educational levels separately.

Description of Gender Gaps - From Education (in ICT-related issues) to Work in the ICT sector

1. Gender Gaps in Educational Choices

The first gender gap on which we focus is the percentage of the whole adult population in each country who undertake educational fields related to the ICT sector (Maths, Statistics, Computers and Engineering). Results are presented in Table 7.

Table 7. Gender Gaps in the Percentage of Individuals who undertake studies in Maths, Statistics, Computing and Engineering (2011)

	Average among all 26 Countries	Western Europe	Eastern Europe	Northern Europe	Southern Europe
Total Population (16-64)					
Total	4.49%	1.94%	12.25%	2.3%	1.3%
Males	7.18%	3.05%	20.19%	3.32%	1.62%
Females	1.91%	0.75%	4.54%	1.32%	0.99%
Gap (Male-Female)	**5.27%**	**2.3%**	**15.65%**	**2%**	**0.63%**
Sample Size	2,867,182	678,140	736,747	645,471	806,824
Population (16-64) with less than University Studies					
Total	6.88%	1.36%	17.34%	2.35%	1.68%
Males	10.91%	2.3%	27.28%	3.4%	2.12%
Females	2.72%	0.41%	6.49%	1.24%	1.28%
Gap (Male-Female)	**8.19%**	**1.89%**	**20.79%**	**2.16%**	**0.84%**
Sample Size	1,359,635	314,814	445,196	301,749	297,876
Population (16-64) with University Studies or More					
Total	5.67%	5.2%	11.43%	3.79%	4.2%
Males	9.2%	7.92%	20.61%	6.02%	5.74%

Females	2.84%	2.22%	4.79%	2.14%	2.97%
Gap (Male-Female)	**6.36%**	**5.7%**	**15.82%**	**3.88%**	**2.77%**
Sample Size	619,644	171,268	114,068	204,880	129,428

Overall, we can see that for individuals with less than college education, around 11% of males choose these types of studies, compared with 3% of females. Hence, the gender gap amounts to 8%. The gap varies considerably across regions. In particular, in Eastern European countries, 27% of males undertake these fields, compared to only 6.5% of females, which raises the gender gap to 21%. On the other hand, in Southern Europe, only 2% of males compared to 1.3% of females undertake these studies, which is a very small percentage (for both males and females) and lowers the gender gap to a very small level (less than 1%).

When we focus on individuals with college education, we can see that the percentage of males who undertake these studies falls slightly, whereas the percentage of females remains very similar. Therefore, the gender gap falls slightly. Again we find significant differences between groups of countries. Differences between males and females undertaking these types of studies at university level are biggest in Eastern Europe and smallest in Southern Europe. However, this is partly due to the fact that the magnitude of individuals who pursue these types of studies is much smaller in the latter countries than in the former.

2. Gender Gaps in the % of workers among individuals who choose educational fields related to ICT jobs.

The second gap we can account for is the gender gap in terms of the labour market activity of individuals who have acquired the educational profile described above. Table 8 reports the percentage of individuals who work among those who report having the selected type of studies.

Table 8. Gender Gaps in the Percentage of Individuals who work among those who undertake education in Maths, Statistics, Computing and Engineering (2011)

	Average among all 26 Countries	Western Europe	Eastern Europe	Northern Europe	Southern Europe
Total Population with the selected studies (16-64)					
% Working	71.95%	86.31%	68.57%	79.17%	72.7%
% Working Males	74.45%	88.61%	71.32%	80.27%	77.25%

% Working Females	62.96%	76.96%	56.72%	76.51%	65.56%
Gap (Male-Female)	**11.49%**	**11.65%**	**14.6%**	**3.76%**	**11.69%**
Sample Size	128,725	13,181	90,222	14,844	10,478
Population (16-64) with less than University Studies					
% Working	67.87%	85.17%	66.59%	72.99%	65.6%
% Working Males	70.87%	87.43%	69.58%	74.37%	72.11%
% Working Females	55.46%	72.49%	52.92%	69.01%	55.22%
Gap (Male-Female)	**15.41%**	**14.94%**	**16.66%**	**5.36%**	**16.89%**
Sample Size	93,575	4,268	77,184	7,079	5,044
Population (16-64) with University Studies or More					
% Working	82.8%	86.86%	80.29%	84.8%	79.28%
% Working Males	85.06%	89.22%	82.52%	86.2%	82.09%
% Working Females	76.92%	78.44%	73.33%	81.92%	74.95%
Gap (Male-Female)	**8.14%**	**10.78%**	**9.19%**	**4.28%**	**7.14%**
Sample Size	35,150	8,913	13,038	7,765	5,434

When we take all countries together and focus on individuals with less than a college education, we find that, on average, 71% of males who undertake these types of studies work as compared to 55% of females. Thus, the gender gap on average amounts to 15.4%. Differences across groups of countries emerge very clearly: the gap is the largest for Western and Southern Europe (although for the former the employment rate is much higher for both males and females than in the latter), and lowest for Northern Europe, where the gender gap is below 6%.

With respect to individuals with a college education, we can see that, on average, gender gaps are much smaller. When considering all countries together, the employment rate of male individuals is 85% (much higher than among non-college workers) whereas for females it amounts to 77% (more than 20 percentage points higher than for those females with no

college education). As before, gender gaps in Western Europe are highest (11%) while those in Northern Europe (4.2%) are lowest.

3. Gender Gaps in the Incidence of Workers in ICT Jobs among those who undertake (University) Education related to them

We now look at the magnitude of the leaky pipeline for men and women who undertake advanced (university level) studies but, for different reasons, have not directed their professional trajectory to the ICT sector. In order to assess the magnitude of those females who, in spite of having studied fields related to the ICT sector do not end up there, we report the complete labour market distribution of males and females who engage in these studies. Therefore, we report the percentage of those who work in the ICT sector, in other non-ICT service sectors, in alternative sectors and finally the percentage of those who do not work. In this way, we present the entire labour market distribution of individuals who undertake university studies related to the ICT field. We do this separately for all men and women and also for different ages, in order to ascertain at which stage of life the leaky pipeline seems to be stronger. As before, we report these statistics for all Member States together as well as the four blocks of (Western, Eastern, Northern and Southern) countries.

Table 9 presents these statistics. The first panel presents the distribution for women, the second for men, and the third panel reports the gender gap in the percentage of those who work in the ICT sector for each age interval and for all countries as well as for the different blocks of European countries.

Table 9. Labour Market Distribution of individuals who undertake (university level) education in Statistics, Maths, Computing and Engineering – By Age and Gender (2011)

Women						
		All	Western	Eastern	Northern	Southern
All	**% work in ICT**	**10.76%**	**13.71%**	**6.89%**	**15.02%**	**8.93%**
	% work in non-ICT service sectors	44.28%	45.96%	39.13%	42.88%	52.16%
	% work in other sectors	21.51%	18.37%	27.13%	23.53%	13.48%
	% do not work	23.46%	21.96%	26.84%	18.58%	25.43%
Less than 30 years old	**% work in ICT**	**12.67%**	**13.72%**	**12.16%**	**11.82%**	**13.29%**
	% work in non-ICT service sectors	31.35%	38.11%	27.52%	34.85%	28.99%
	% work in other sectors	19.56%	16.46%	24.64%	22.42%	12.08%
	% do not work	36.42%	31.71%	35.68%	30.91%	45.65%
30-44 years old	**% work in ICT**	**14.66%**	**16.87%**	**8.43%**	**21.90%**	**10.70%**
	% work in non-ICT service sectors	47.29%	46.79%	47.53%	42.71%	53.37%
	% work in other sectors	22.75%	19.91%	30.04%	21.48%	18.40%

	% do not work	15.29%	16.42%	13.99%	13.91%	17.54%
45 years or older	**% work in ICT**	**5.50%**	**9.38%**	**3.30%**	**7.12%**	**4.22%**
	% work in non-ICT service sectors	46.84%	48.77%	37.62%	46.00%	63.67%
	% work in other sectors	21.00%	17.23%	25.92%	26.62%	8.03%
	% do not work	26.66%	24.62%	33.17%	20.26%	24.08%
Men						
		All	Western	Eastern	Northern	Southern
All	**% work in ICT**	**20.67%**	**26.45%**	**13.48%**	**26.47%**	**21.55%**
	% work in non-ICT service sectors	27.89%	32.15%	21.19%	28.55%	38.79%
	% work in other sectors	36.17%	30.28%	47.79%	30.88%	20.81%
	% do not work	15.27%	11.12%	17.54%	14.10%	18.85%
Less than 30 years old	**% work in ICT**	**25.49%**	**33.65%**	**19.32%**	**28.47%**	**26.45%**
	% work in non-ICT service sectors	19.25%	24.72%	14.53%	24.53%	17.24%
	% work in other sectors	30.16%	21.25%	40.74%	26.70%	17.89%
	% do not work	25.10%	20.38%	25.42%	20.30%	38.42%
30-44 years old	**% work in ICT**	**26.11%**	**29.88%**	**18.56%**	**32.44%**	**26.03%**
	% work in non-ICT service sectors	30.19%	33.85%	24.27%	29.24%	38.80%
	% work in other sectors	37.87%	31.37%	52.56%	30.86%	26.83%
	% do not work	5.83%	4.91%	4.60%	7.46%	8.34%
45 years or older	**% work in ICT**	**10.91%**	**17.00%**	**5.28%**	**16.16%**	**11.34%**
	% work in non-ICT service sectors	30.41%	33.99%	22.23%	30.06%	55.67%
	% work in other sectors	37.80%	33.99%	47.49%	33.58%	14.54%
	% do not work	20.88%	15.02%	25.00%	20.19%	18.45%
Gender gap in the proportion of those who work in ICT						
		All	Western	Eastern	Northern	Southern
All		9.91%	12.74%	6.59%	11.45%	12.62%
Less than 30 years old		12.82%	19.93%	7.16%	16.65%	13.16%
30-44 years old		11.45%	13.01%	10.13%	10.54%	15.33%
45 years or older		5.41%	7.62%	1.98%	9.04%	7.12%

Some interesting issues emerge from this table:

1. Taking all countries together and for all men and women (without disaggregating by age), we can see that the percentage of males who choose to work in the ICT sector amounts to 24%, whereas only 14% of their female counterparts work in it – the gap amounts to 10% in favour of men.
2. Differences across groups of countries are not very significant, with the exception of Eastern Europe, where the incidence of males and

females are, in general, much lower than the rest, and the gaps are also smaller.

3. If we focus on differences by age and take all countries together, we can see that the percentage of women who work in the ICT sector when they are 30-44 years old is even higher than that found for younger women (less than 30 years old). If we consider that the women included in the sample are representative of the population at that age interval, then we can conclude that, at least on average, there does not appear to be evidence that women quit this sector to move to either of the other sectors or to no work as they age from less than 30 to at most 44 years[116]. On the contrary, the incidence of women in the ICT sector among those between 30 and 44 is slightly higher than that observed for those younger than 30. However, the picture is not identical for different groups of countries, given that for Eastern and Southern Europe, the percentage of women who work in the ICT sector in the 30-44 age group is smaller than that found for the previous age interval, i.e. less than 30. Therefore, for these two groups of countries, there may well be some evidence of a small leaky pipeline of women who quit the ICT sector as they reach the age of 44.

4. When we compare the incidence of women who work in the ICT sector of those between 30 and 44 with those older than 45, there seems to be a significant decrease. Indeed, if we compare the differences in the distribution between these two age intervals, we can see that the drop observed is basically compensated with the increase in the percentage of women who do not work. The incidence of women working in other sectors remains approximately the same between the two age groups. Therefore, for Europe as a whole, we can see that a significant percentage of women who work in the ICT sector may quit the labour market at the age 45 or older[117]. We only see this effect in the ICT sector, and not from other either service or non-service sectors. However, this behaviour is very similar to that observed by males. If we interpret this, at least partly, as a leaky pipeline, we must therefore conclude that this is an effect which relates to both men and women who work in the ICT sector and not in others.

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[116] It should be noted that direct evidence regarding the leaky pipeline can only be obtained when we have longitudinal data so that we follow individuals over time and get information relating to their labour market trajectory. Given that we only have cross-sectional data, we can only provide indirect evidence of the quit rate of women from the ICT sector such as their age. Indeed, to obtain this indirect evidence, we must assume that there are no significant cohort changes in the incidence of women in the ICT sector among those between 30-44 and those younger than 30 on the one hand, and between those older than 45 and those between 30-44 on the other. In other words, we must assume that those who are 30-44 (>45) years old at the time of the interview their incidence in the ICT sector when they were younger than 30 (31-44 years) can be represented by the one observed at the time of the interview for those younger than 30 (30-45).

[117] See footnote 57.

Economic Case 2: Gender Differences in Job Conditions: ICT sector versus other non-ICT Service Sectors

Introduction - The European Survey of Working Conditions (2010)

The European Survey of Working Conditions (2010) covers 34 European countries, although for this study only 33 have been included in the analysis[118]. It was launched in the early nineties, and contains individual information on issues such as employment status, working time duration and organisation, work organisation, learning and training, physical and psychosocial risk factors, health and safety, work-life balance, worker participation, earnings and financial security, as well as work and health. For our analysis, we use the latest wave, 2010, so as to have a more actual picture of the whole analysis.

Given its European coverage as well as its main aim, it is particularly appropriate for the analysis of Gender Differences in Work Conditions, which is the focus of our Economic Case 2. In what follows, we select all those workers working in the ICT sector[119] from all countries and try to describe male and female workers in this sector so as to establish whether or not, and indeed how, job conditions differ by gender.

Gender Differences in the ICT Sector – Demographics and some Job Characteristics

We start by presenting gender differences in demographic and job characteristics of males and females working in the ICT sector with respect to those working in Service Sectors other than those related to ICT[120]. Since the number of observations per country is not particularly large (the ICT sector employs a small share of total employment), we group the 33 different countries into four blocks: Western Europe, Eastern Europe, Northern Europe and Southern Europe[121]. Table 10 and Table 11 present the basic demographics and job characteristics for workers in the ICT and non-ICT service sectors, respectively.

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[118] Countries include: EU27, Norway, Croatia, the Former Yugoslav Republic of Macedonia, Turkey, Albania, Montenegro and Kosovo.

[119] The ICT sector refers to the NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1).

[120] More precisely, under the non-ICT Service Sector we include the following sectoral activities: K (Financial and insurance activities), L (Real estate activities), M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N (Administrative and support service activities), O (Public administration and defence), P (Education), Q (Human health and social work activities) and S (Other service activities).

[121] Regional distribution:

- Western Europe: Belgium, Germany, France, Luxemburg, Netherlands, Austria
- Eastern Europe: Bulgaria, Czech Rep., Hungary, Poland, Romania, Slovakia
- Northern Europe: Denmark, Estonia, Ireland, Latvia, Lithuania, Finland, Sweden, the UK, Norway
- Southern Europe: Greece, Spain, Italy, Cyprus, Malta, Portugal, Slovenia, Croatia, Albania, Kosovo, FYROM, Montenegro

Table 10. Gender Differences in the ICT sector – Demographics and Job Characteristics. (2010)

% of Women	Western		Eastern		Northern		Southern	
	29.42%		34.30%		28.57%		35.60%	
	Men	Women	Men	Women	Men	Women	Men	Women
Demographic Characteristics								
Average Age	39.3	39.1	38.2	37.8	41.8	41.6	36.1	38.0
Primary	0.46%	2.20%	0%	0%	0.20%	0.49%	1.17%	0.42%
Secondary + non-tertiary	31.74%	32.97%	42.31%	61.05%	35.56%	33.01%	46.60%	50.00%
University	67.81%	64.84%	57.69%	38.95%	64.24%	66.50%	52.22%	49.58%
Head of the Household	81.06%	36.87%	70.56%	34.74%	71.54%	39.90%	59.76%	38.46%
Job Characteristics								
Average Monthly Earnings (in Euros)	2280.52	1911.33	621.86	546.73	2808.29	2141.31	1004.74	918.00
Managers and Professionals	58.16%	37.43%	48.90%	37.89%	66.27%	60.59%	40.43%	39.91%
Technicians and assoc. Professionals	23.45%	24.02%	30.77%	22.11%	23.47%	19.21%	40.90%	24.46%
Clerical	7.59%	27.93%	2.75%	25.26%	2.76%	14.78%	6.86%	30.04%
Services and Sales	2.07%	5.03%	2.75%	6.32%	1.18%	2.96%	2.84%	3.00%
Manual Labour	8.74%	5.59%	14.84%	8.42%	6.31%	2.46%	8.98%	2.58%
Female Bosses	11.38%	18.87%	9.22%	38.89%	17.87%	38.12%	11.88%	26.94%
Mostly Female Co-workers	4.37%	32.21%	2.08%	40.26%	5.46%	31.36%	7.20%	32.85%
Permanent Contract	84.13%	73.13%	85.42%	70.00%	87.80%	88.59%	65.56%	68.34%
Temporary Contract	13.77%	24.38%	14.58%	25.56%	9.09%	10.87%	23.51%	21.61%
Small Firm (1-9 workers)	32.40%	28.32%	47.80%	27.91%	30.88%	21.78%	41.36%	44.35%
Medium Firm (10-99 workers)	32.87%	33.53%	39.01%	48.84%	32.67%	34.65%	42.82%	39.13%
Large Firm (100 or more workers)	34.73%	38.15%	13.19%	23.26%	36.45%	43.56%	15.82%	16.52%
Private Sector	80.87%	78.69%	79.67%	73.68%	76.47%	63.11%	79.16%	72.46%
Public Sector	8.20%	9.84%	10.44%	22.11%	17.06%	29.61%	9.60%	23.73%

Table 11. Gender Differences in the Non-ICT Service Sectors – Demographics and Job Characteristics. (2010)

% of Women	Western	Eastern	Northern	Southern
	63.84%	69.13%	71.39%	58.94%

	Men	Women	Men	Women	Men	Women	Men	Women
Demographic Characteristics								
Average Age	42.4	40.8	43.6	43.7	44.7	44.3	42.1	40.3
Primary	1.88%	2.23%	2.30%	1.19%	1.36%	1.15%	4.44%	5.28%
Secondary + non-tertiary	46.59%	54.26%	60.09%	62.66%	45.54%	48.14%	51.41%	49.41%
University	51.53%	43.51%	37.60%	36.15%	53.10%	50.71%	44.14%	45.31%
Head of the Household	76.89%	34.96%	72.87%	39.81%	69.53%	44.04%	71.62%	34.10%
Job Characteristics								
Average Monthly Earnings (in Euros)	2032.16	1415.46	452.82	405.72	2271.20	1555.91	830.31	797.60
Managers and Professionals	39.23%	30.42%	32.34%	36.07%	47.80%	41.90%	37.04%	40.22%
Technicians and assoc. Professionals	21.34%	22.19%	17.99%	24.47%	15.45%	18.32%	18.51%	20.18%
Clerical	9.57%	12.34%	4.59%	11.06%	4.10%	7.55%	8.32%	14.45%
Services and Sales	16.18%	23.62%	23.25%	16.11%	19.10%	22.96%	17.72%	13.80%
Manual Labour	13.67%	11.43%	21.82%	12.30%	13.55%	9.27%	18.41%	11.34%
Female Bosses	20.63%	52.78%	24.44%	61.48%	29.58%	67.81%	16.97%	47.95%
Mostly Female Co-workers	18.03%	69.11%	19.89%	80.71%	22.91%	78.16%	15.77%	65.19%
Permanent Contract	86.95%	84.16%	76.77%	84.17%	82.25%	83.23%	69.88%	69.57%
Temporary Contract	11.11%	13.23%	19.75%	14.25%	13.38%	12.96%	17.94%	19.96%
Small Firm (1-9 workers)	33.01%	39.80%	35.61%	34.97%	26.18%	28.07%	38.74%	39.74%
Medium Firm (10-99 workers)	39.95%	36.96%	46.84%	47.24%	45.51%	53.09%	43.71%	46.18%
Large Firm (100 or more workers)	27.03%	23.25%	17.55%	17.79%	28.31%	18.85%	17.54%	14.08%
Private Sector	47.43%	48.68%	35.48%	29.52%	37.76%	26.79%	39.04%	39.13%
Public Sector	38.61%	35.00%	55.76%	63.71%	54.91%	67.52%	57.12%	55.15%

* Under non-ICT Service Sector we include the following sectoral activities: K (Financial and insurance activities), L (Real estate activities), M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N (Administrative and support service activities), O (Public administration and defence), P (Education), Q (Human health and social work activities) and S (Other service activities).

In what follows, we highlight the most important differences:

1. % of Women in ICT and non-ICT sectors: The first row of Tables 6 and 7 reveals an interesting, although well-known fact: women are highly

represented in non-ICT sectors (in every group of European countries, although more so in Northern and Eastern Europe), whereas its incidence in ICT sectors is much smaller – from 28.6% in Northern Europe to 35.6% in Southern Europe.

2. If we compare demographic characteristics between females in the ICT versus non-ICT sectors, we can see that in the former, women are younger and their educational level is clearly higher. This is so for each of the four groups of countries under consideration.

3. When we compare job characteristics between women in the ICT versus non-ICT sector, we observe the following:

    - Average **monthly earnings are clearly higher for women in the ICT versus non-ICT sector**, and the difference is generally larger than those observed among men.
    - **The Gender Gap** (unadjusted) **in monthly earnings is smaller in the ICT than in the non-ICT sector in Western and Northern Europe, although it is slightly higher in Eastern and Southern Europe**.
    - Women in the ICT sector work generally in larger firms than their counterparts of the non-ICT sector.
    - **The percentage of female bosses in the ICT sector is much smaller than in the non-ICT sectors**.

Gender Differences in Work Conditions in the ICT versus Non-ICT Sectors - Descriptive

This section presents a descriptive analysis in gender differences observed in each of the following aspects related to work conditions:

(i) Training

(ii) Flexible schedule

(iii) Wages

(iv) Satisfaction

(v) Work environment

(vi) Stress

(vii) Discrimination.

All of our mean values take the value of 1 when the individual responds positively to the question (i.e. agrees or says “yes”), and even if the question is a negative one, the mean values are always between 0 and 1. These (weighted) mean values for men and women give us an idea of the different experiences men and women have in the ICT sector. We start by analysing each aspect.

Table 12. Gender Differences in Work Conditions in the ICT and non-ICT Service Sectors (2010)

	ICT		non-ICT Services	
	Female	Male	Female	Male
***Training paid for or provided by your employer or by yourself if self-employed* (1=agree)**				
Western	0.42	0.42	0.43	0.44
Eastern	0.26	0.41	0.40	0.36
Northern	0.56	0.48	0.52	0.53
Southern	0.36	0.42	0.38	0.36
***Would you say that for you arranging to take an hour or two off during working hours to take care of personal or family matters is ... ?* (1=easy)**				
Western	0.75	0.77	0.61	0.67
Eastern	0.72	0.84	0.56	0.64
Northern	0.81	0.90	0.70	0.79
Southern	0.67	0.76	0.59	0.66
***Hourly Wage* (in Euros)**				
Western	10.56	13.41	11.02	12.78
Eastern	3.37	4.08	2.54	2.79
Northern	14.36	16.06	10.85	14.46
Southern	5.40	6.87	5.71	5.66
***Agree/Disagree: I am well paid for the work I do?* (1=agree)**				
Western	0.51	0.56	0.49	0.55
Eastern	0.32	0.51	0.29	0.32
Northern	0.52	0.64	0.38	0.49
Southern	0.41	0.52	0.38	0.42
***On the whole, how satisfied are you with working conditions in your main paid job?* (1= positive)**				
Western	0.84	0.90	0.87	0.90
Eastern	0.76	0.85	0.84	0.83
Northern	0.87	0.93	0.89	0.90
Southern	0.82	0.88	0.81	0.80
***I feel 'at home' in this organisation* (1=agree)**				
Western	0.70	0.78	0.79	0.77
Eastern	0.56	0.76	0.71	0.67
Northern	0.77	0.81	0.80	0.79
Southern	0.61	0.72	0.70	0.70
The organisation I work for motivates me to give my best job				

***performance* (1=agree)**				
Western	0.65	0.70	0.67	0.66
Eastern	0.60	0.49	0.61	0.60
Northern	0.65	0.72	0.72	0.69
Southern	0.65	0.71	0.66	0.65
***You are able to apply your own ideas in your work* (1=agree)**				
Western	0.56	0.73	0.64	0.64
Eastern	0.34	0.75	0.62	0.58
Northern	0.67	0.84	0.69	0.71
Southern	0.64	0.68	0.63	0.66
***Your immediate manager/supervisor encourages you to participate in important decisions* (1=agree)**				
Western	0.71	0.72	0.63	0.67
Eastern	0.57	0.72	0.74	0.72
Northern	0.75	0.85	0.78	0.78
Southern	0.75	0.84	0.74	0.80
***You have enough time to get the job done* (1=agree)**				
Western	0.60	0.72	0.72	0.74
Eastern	0.61	0.79	0.81	0.82
Northern	0.73	0.76	0.74	0.75
Southern	0.70	0.78	0.78	0.81
***You experience stress in your work* (1=agree)**				
Western	0.37	0.30	0.28	0.26
Eastern	0.14	0.21	0.30	0.27
Northern	0.22	0.14	0.22	0.21
Southern	0.35	0.29	0.28	0.30
***Have you experienced discrimination on the basis of your sex?* (1=agree)**				
Western	0.109	0.005	0.031	0.023
Eastern	0.074	0	0.009	0.003
Northern	0.053	0	0.023	0.010
Southern	0.047	0.007	0.016	0.006

(i) Training:

Regarding whether or not training has been provided (or paid for) by their employer, Table 12 reveals that for workers in the ICT sector, there does not seem to be much of a difference between men and women in Western Europe, although 41% of men in Eastern Europe and 42% of men in

Southern Europe are given training whilst this is only the case for 26% of women in Eastern Europe and 36% of women in Southern Europe, and vice versa (56% of women and 48% of men) in Northern Europe. Hence, gender differences exist and do not favour women with regards to be given training in Eastern Europe and Southern Europe, whereas women from Northern Europe receive more training than men in this sector. These gender differences are not observed in the non-ICT sectors. Training is provided to men and women in similar proportions. In addition, when comparing women in the ICT to non-ICT sectors, differences in training do not appear to be high, except for Eastern European females who appear to enjoy training less in the ICT than in the non-ICT sectors.

(ii) Flexible Schedule:

Table 12 shows that considering the ICT sector, when asked if arranging to take an hour or two off work due to personal matters is easy, the men, overall, agree that it is easier than for women. The difference between men and women in Western Europe (77% and 75% respectively) is the smallest, while the difference between men and women in Eastern Europe (84% and 72% respectively) is the largest. There seem to be significant differences between men and women in Eastern Europe with respect to flexibility, smaller differences in Northern and Southern Europe, and hardly any differences in Western Europe. In the non-ICT sector, although gender differences are similar to those observed in the ICT sector, the general pattern is that flexibility is, on average, more difficult than in the ICT sector, which clearly represents an advantage of working in the ICT sector for both men and women.

(iii) Hourly Wages:

With respect to hourly wage, men, overall, earn more than women both in the ICT and non-ICT sector. Within the former, the table below shows that the biggest difference is in Western and Southern Europe, where the female to male ratio is 0.78. The smallest difference is observed in Northern Europe, where the ratio rises to 0.89. If we compare the ICT with the non-ICT sector, we can observe that in the non-ICT sector, the gender wage gap is highest in Northern Europe (the ratio is 0.75), whereas it is smallest in Eastern Europe (the ratio rises to 0.91). In Western Europe the gender gap is higher in the non-ICT sector whereas in Southern Europe the difference is negligible. Hence, there is no uniform pattern across Europe with respect to gender differences in pay in the ICT versus the non-ICT sector: Northern and Western Europe females have smaller gender wage gaps in the ICT sector when compared to the non-ICT sectors, whereas for Eastern European females the reverse is found.

Finally, if we compare hourly wages of females in the ICT and non-ICT sectors, we can see that in Western and Southern Europe females earn less in the ICT than in the non-ICT sector, whereas the contrary seems to true in

Eastern and Northern Europe. The difference is particularly significant in the latter.

(iv) Satisfaction

When workers in the ICT sector are asked if they are well-paid for the work they do, a higher percentage of men than women, overall, agree. The largest difference is in Eastern Europe, with 51% of men agreeing, whereas only 32% of women agree; the smallest difference is in Western Europe, with 56% of men agreeing and 51% of women agreeing. If we compare this pattern with the one observed for workers in the non-ICT sector, it can be observed that gender differentials are smaller in the latter. Finally, if we compare women in the ICT with the non-ICT sectors, a higher percentage of women feel that they are well-paid for their work in the ICT sector.

Concerning satisfaction with working conditions, the first point to note is that on average, satisfaction with working conditions is very high for all men and women working in the ICT and non-ICT sectors – over 80% report being satisfied or very satisfied). Regarding gender differences, the men, overall, report higher satisfaction levels than the women. The biggest difference is in Eastern Europe; 85% of men report being quite satisfied with only 76% of women reporting the same. Again, gender differences are smaller in the non-ICT sector.

(v) Work Environment

With regards to work environment, four questions stand out in our preliminary analysis.

- Firstly, they are asked if they feel 'at home' in their organisation; men agree with this statement more than women, overall. The largest difference is between the men and women in Eastern Europe (76% and 56% respectively) while the smallest difference is in Northern Europe (81% of men and 77% of women agree). If we compare these gender differentials with those observed in the non-ICT sector, we can see that in the latter, gender differences are tiny, if present at all. Comparing women in the ICT to non-ICT sectors, we observe, in general, a lower perception of feeling at home for women working in the ICT sector.
- Secondly, when asked if the organisation motivates them to give their best job performance, with the exception of Eastern Europe, the men agree more than the women (5-7% more on average). However, in Eastern Europe, almost 60% of women agree while only 49% of men agree. Gender differences in non-ICT jobs are, again, smaller. Indeed, in Eastern Europe, 71% of women report feeling at home in their job, whereas this is the case for 67% of men. Differences between females working in the ICT versus non-ICT sectors seem rather small in general.

- Thirdly, when asked if they are able to apply their own ideas in their work, the men agree more than the women. In Eastern Europe, we can see the largest difference (75% of men agree while only 34% of women do); in Western and Northern Europe, 17% more men agree than women, while in Southern Europe, the difference is not so large (68% of men and 64% of women agree). Gender differences are much smaller in the non-ICT sector. If we focus on differences between women who work in the ICT versus non-ICT sectors, we can see that, particularly in Western and Eastern Europe, women in the ICT sector feel less able to apply their own ideas than their counterparts in the non-ICT sector.

(vi) Stress

With respect to stress, participants are asked a couple of questions:

- Do you have enough time to get the job done? In general, men agree more than women, with the biggest difference, again, in Eastern Europe (79% of men agree whilst only 61% of women do), and the smallest difference is in Northern Europe (76% of men and 73% of women). Another interesting issue to note is that when females from the ICT and non-ICT sectors are compared, in general females in the ICT sector agree less with the question than those in the non-ICT sector, thus revealing that there is more stress in the job for females in the former than in the latter.
- When asked if they experience stress in their work, with the exception of Eastern Europe, the women agree more than the men (on average 5-8% more), whilst in Eastern Europe, 21% of men agree while only 14% of women do. Regarding stress, apart from Eastern European men, women experience more stress at work than men. If we compare females in the ICT with respect to the non-ICT sector, females from Western and Southern Europe who work in the ICT sector report experiencing more stress in their work than their counterparts from the non-ICT sectors. The reverse is found for Eastern European females, while no difference is found in Northern Europe.

(vii) Discrimination

Finally, concerning discrimination, participants are asked if they have experienced discrimination on the basis of their sex. All of the values are quite low, but nevertheless, women report higher values than men. The largest difference is in Western Europe, with 10.9% of women agreeing and only 0.5% of men, whilst the smallest is in Southern Europe, with 4.7% of women and 0.7% of men. If we compare females in the ICT and non-ICT sectors, we can see that, on average, females in the ICT sector experience more discrimination, particularly in Western Europe, where differences are

noticeable. Still, the perception of gender discrimination is quite small in both in the ICT and non-ICT sector.

In summary, from this descriptive analysis, we can conclude that average gender differences in work conditions exist although we cannot find a clear and homogeneous pattern for all European countries. Still, women in ICT sectors seem to do worse in general with respect to men in particular when they relate to hourly wages and work environment.

If we compare women in the ICT versus non-ICT sectors, we also find interesting differences: On the one hand, they seem to exhibit higher flexibility when it comes to taking care of personal or family matters, whilst they also earn higher wages on average in Northern and Eastern, although not in Western and Southern Europe. On the other hand, they seem to feel more stress in their job and their perception of having experienced gender discrimination is higher than for their counterparts in the non-ICT sector.

However, mean differences, although illustrative, offer an incomplete picture of gender differences. We need to estimate whether the observed differences persist when we compare similar men and women or similar women in the ICT and non-ICT sectors in terms of age, education, and other job conditions, such as type of contract, type of sector and occupation. Therefore, in the next section, we extend the analysis to estimate whether once we compare similar workers, gender differences in work conditions still persist.

Estimation of Differences in Work Conditions – Men versus women in the ICT sector and women in ICT versus women in non-ICT sectors

The aim of this analysis is twofold:

1. Firstly, we select men and women working in the ICT sector and estimate each of the work condition variables selected above on a set of controls – age, educational level…. In addition, we select an indicator for females. The coefficient of such an indicator reveals whether gender differences persist when we compare similar men and women in terms of the included controls.
2. We select women working in the ICT and in the non-ICT sector and estimate whether differences among these women persist when we compare similar women in terms of age, education, type of contract, occupation and type of sector (public/private).

For the two estimations, as each of the dependent variables reflecting work conditions are binary (1 or zero) except for hourly wages, we estimate them by maximum likelihood (logic model)[122]. For the estimation of wages, we

[122] We report odd-ratios: A value of 1 (or not significantly different from 1) would reveal no gender difference in the estimated variable. A smaller value would reflect a lower position of women with

use the standard Ordinary Least Square Estimator. As the number of observations, particularly for some of the groups of countries, is very low, we estimate all countries together in the estimation although indicators for each of the four groups are also included as controls. Table 13 presents the results:

1. In the first column, the reported coefficients are gender differences in the ICT sector for each of the working condition variables described in the column on the left. Only those coefficients with at least one * are significantly different from zero. A coefficient lower than one would reflect poorer conditions for females with respect to men in the ICT sector. The table reveals that when women in the ICT sector are compared with men in the same sector with the same age, educational level, occupation, type of contract, size of firm and type of sector (public/private) and the same group of countries, the following results emerge:
    a. Women encounter more difficulties when it comes to arranging their time schedule for family matters than their male counterparts.
    b. Women disagree more than their male counterparts with regards to their feeling of being well-paid for the work they do.
    c. Women are less satisfied with the overall working conditions in their main paid job.
    d. Women feel they cannot apply their own ideas in their work as much as their male counterparts.
    e. Women feel more stress than their male counterparts in their job.
    f. Women feel more discrimination on the basis of their sex than their male counterparts.
    g. Finally, with respect to hourly wages, we find no significant differences between similar men and women in the ICT sector.

Table 13. Estimation of Differences in Work Conditions (2010)

	Men vs. Women in ICT	ICT vs. non-ICT for Women	Men vs. Women in non-ICT
Training paid for or provided by your employer or by yourself if self-employed	0.923 (0.136)	0.832 (0.100)	1.040 (0.042)
Would you say that it is easy for you to arrange to take an hour or two off during	0.618*** (0.110)	1.618*** (0.214)	0.728*** (0.030)

respect to men. The same interpretation must be applied to the second column, when women from the ICT and non-ICT sectors are compared in terms of work conditions.

working hours to take care of personal or family matters?			
***Hourly Wage* (in Euros)**	-0.075 (0.047)	0.089** (0.036)	-0.073*** (0.016)
Agree/Disagree: I am well paid for the work I do	0.657*** (0.094)	1.068 (0.127)	0.792*** (0.031)
On the whole, how satisfied are you with working conditions in your main paid job?	0.594** (0.130)	0.750* (0.120)	0.925 (0.051)
I feel 'at home' in this organisation	0.753* (0.126)	0.662*** (0.085)	1.028 (0.046)
The organisation I work for motivates me to give my best job performance	0.904 (0.143)	0.803* (0.102)	1.081* (0.044)
You are able to apply your own ideas in your work	0.494*** (0.080)	0.709*** (0.090)	0.938 (0.039)
Do you have enough time to get the job done	0.609*** (0.097)	0.688*** (0.087)	0.909** (0.041)
Do you experience stress in your work	1.437** (0.232)	1.072 (0.136)	1.045 (0.045)
Have you experienced discrimination on the basis of your sex?	23.026*** (19.328)	3.121*** (0.748)	1.836*** (0.288)

Note: In addition to the indicator for female (in (1)) and for the ICT sector (in (2)), all estimations include three age groups, three controls for occupation, one control for university education, one control for temporary contract, two controls for firm size and one control for public/private.

The second column of Table 13 estimates the difference in work conditions between females in the ICT versus non-ICT sectors which share demographics and job characteristics (age, education, occupation, type of contract, firm size and type of sector). The interesting results to highlight are the following:

1. Women in the ICT sector enjoy higher flexibility when it comes to arranging their time schedule for personal or family matters than their female counterparts in the non-ICT sectors.
2. Women in the ICT sector earn almost 9% more than similar women in the non-ICT sectors.
3. However, on the negative side, women in the ICT sector feel less satisfied in their main job, feel less at home in their organisation, and feel less motivation from their organisation than their counterparts in the non-ICT sectors.
4. In addition, women in the ICT sector feel they have less time to get their work done than their counterparts in the non-ICT sector.

5. Finally, women in the ICT sector feel more discrimination on the basis of their sex than their comparable women in the non-ICT sectors.

Conclusion

In this economic case we have analysed gender differentials in work conditions between men and women who work in the ICT sector. In addition, we have also analysed differences in work conditions between women in the ICT sector and women in non-ICT sectors. By work conditions we refer to issues related to training, flexibility in the work schedule, hourly wages, job satisfaction, stress and discrimination on the basis of gender.

After a description of average differentials on the different aspects of work conditions, we estimate whether differences persist when we compare (i) similar men and women in the ICT sector in terms of age, occupation, educational attainment and other job conditions such as firm size and type of contract. The most important results can be summarised as follows:

When women in the ICT sector are compared to similar men in the same sector, in general, women feel worse in terms of work conditions. In particular, they encounter more difficulties when it comes to arranging their time schedule for family matters than their male counterparts, they disagree more than their male counterparts with regards to their feelings of being well-paid for the work they do, and they are less satisfied with the overall working conditions in their main paid job. Women also feel that they cannot apply their own ideas in their work as much as their male counterparts, and feel more stressed than their male counterparts in their job in addition to feeling more discrimination on the basis of their sex than their male counterparts. Finally, no gender differences in hourly wages emerge between similar men and women in the ICT sector.

In the same vein, when we compare women in the ICT sector with comparable women in the non-ICT sectors, we find some positive and negative issues. With regards to the positive issues, women in the ICT sector enjoy higher flexibility when it comes to arranging their time schedule for personal or family matters than their female counterparts in the non-ICT sectors. Furthermore, women in the ICT sector earn almost 9% more than similar women in the non-ICT sectors. However, on the negative side, women in the ICT sector feel less satisfied in their main job, feel less at home in their organisation, and feel less motivation from their organisation than their counterparts in the non-ICT sectors. Furthermore, women in the ICT sector feel they have less time to get their work done than their counterparts in the non ICT sector and finally, they feel more discrimination on the basis of their sex than their comparable women in the non-ICT sectors.

Economic Case 3: Gender Gaps among Entrepreneurs in the ICT and non-ICT sectors

Introduction - The European Survey of Working Conditions (2010)

As with Economic Case 2, for this analysis, we make use of "The European Survey of Working Conditions (2010)", which covers 34 European countries[123]. This survey was launched in the early 90s, and contains individual information on issues such as employment status, working time duration and organisation, work organisation, learning and training, physical and psychosocial risk factors, health and safety, work-life balance, worker participation, earnings and financial security, as well as work and health. For our analysis, we use the latest wave, 2010, so as to have a more actual picture of the whole situation. For the purpose of this Economic Case, we focus on the entrepreneurs (workers who report to be self-employed with or without employees) and compare work conditions of men and women in the ICT sector[124] in the first place, as well as entrepreneur women in the ICT versus the non-ICT sectors.

In what follows, we select all those entrepreneurs who work in the ICT sector from all countries and try to describe male and female workers in this sector to learn whether or not, and indeed how, job conditions differ in accordance with gender.

Gender Differences among entrepreneurs in the ICT/non-ICT Sector – Demographics and some job characteristics

Table 14 presents gender differences in demographic and job characteristics of males and females working in the ICT sector with respect to those working in service sectors other than those related to ICT[125]. Selection of entrepreneurs, particularly in the ICT sector reduces the sample size to a great extent and therefore, in what follows, we will refer to all European countries as a whole, without making differences across groups of countries, as was the case with Economic Case 2.

[123] Countries include: EU27, Norway, Croatia, the Former Yugoslav Republic of Macedonia, Turkey, Albania, Montenegro and Kosovo. For the purpose of this study only 33 are considered, with Turkey not included for consistency reasons.

[124] The ICT sector refers to the NACE R2: C (26.1, 26.2, 26.3, 26.4); G (46.5, 47.4); J and M (71.12, 71.2, 72.1).

[125] More precisely, under the non-ICT Service Sector we include the following sectoral activities: K (Financial and insurance activities), L (Real estate activities), M (Professional, scientific and technical activities except for 71 and 72, which are in the ICT sector), N (Administrative and support service activities), O (Public administration and defence), P (Education), Q (Human health and social work activities) and S (Other service activities).

Table 14. Descriptive for Entrepreneurs and non-Entrepreneurs (2010)

	ICT				Non-ICT	
	Entrepreneurs		Non-Entrepr.		Entrepreneurs	
% of Females	19.20%		34.09%		53.89%	
Demographic Characteristics						
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Average Age	41.4	43.3	38.7	38.8	44.9	41.8
Primary	2.32%	0%	0.08%	0.93%	3.14%	3.64%
Secondary + non-tertiary	33.11%	37.50%	39.46%	42.81%	40.53%	50.47%
University	64.57%	62.50%	60.46%	56.26%	56.32%	45.89%
Head of the Household	78.79%	48.57%	69.40%	36.82%	79.11%	41.04%
Job Characteristics						
Average Monthly Earnings (in Euros)	2084.64	1453.23	2006.69	1533.96	1762.13	1431.15
Managers and Professionals	69.90%	65.28%	51.36%	42.63%	56.38%	41.17%
Technicians and assoc. Professionals	24.08%	23.61%	30.18%	22.41%	18.24%	14.27%
Clerical	2.01%	5.56%	6.02%	26.65%	2.54%	2.45%
Services and Sales	0.67%	5.56%	2.41%	3.76%	11.90%	35.67%
Manual Labour	3.34%	0%	10.03%	4.55%	10.94%	6.45%
Mostly Female Co-workers	0.80%	28.57%	5.73%	33.45%	13.00%	66.46%
Small Firm (1-9 workers)	89.77%	93.06%	22.89%	24.56%	85.79%	91.60%
Medium Firm (10-99 workers)	8.25%	5.56%	43.07%	41.36%	11.01%	6.90%
Large Firm (100 or more workers)	1.98%	1.39%	34.04%	34.09%	3.19%	1.50%
Private Sector	88.78%	77.78%	76.38%	70.83%	85.27%	87.68%
Public Sector	1.98%	6.94%	14.13%	23.30%	7.68%	6.60%

In what follows, we highlight the most important differences:

1. **% of Female Entrepreneurs in ICT and non-ICT sectors:** the percentage of females as entrepreneurs in the ICT sector is very low, at less than 20%. This is much smaller than the percentage of

females in the ICT sector as a whole, thus revealing the poor presence of females as entrepreneurs in this sector. Although there are small variations of this percentage across different groups of European countries – larger in Northern and Southern Europe and smaller in Western and Eastern Europe - the percentage is very low for all countries. If we compare this percentage with that of entrepreneurs in non-ICT countries, we see that the difference is striking: In non-ICT service sectors, the percentage of entrepreneurs is larger than 50%. The understanding of this poor presence of females as entrepreneurs in the ICT sector can represent an important initial step towards measures which induce more females to work as entrepreneurs in this sector.

2. **Demographic and job characteristics between entrepreneur females and males in the ICT sector:**
    a. Females are approximately two years older on average and their education level is lower.
    b. Female entrepreneur wages are approximately 30% lower than that of their male counterparts.
    c. The presence of females in less qualified occupations (clerical and services and sales) is higher than that of males. Male entrepreneurs in the ICT sector are more concentrated in Managers and Professional occupations.
    d. Female entrepreneurs tend to work more in smaller firms than males.
    e. Male entrepreneurs tend to be more in the private sector than females.
3. In addition, if we compare **female entrepreneurs in the ICT sector with those entrepreneurs in Service Sectors other than ICT** (columns 1 and 3 of Table 15), we observe the following:
    a. Female entrepreneurs in the ICT sector are older than those in other service sectors.
    b. The educational level of female entrepreneurs in the ICT sector is clearly higher than in other sectors. The percentage of female entrepreneurs with university education is around 62.5% in the ICT sector, compared with 41% in other non-ICT sectors.
    c. Hourly wages are very much the same among female entrepreneurs in the ICT and other non-ICT service sectors.
    d. Female entrepreneurs in the ICT sector work more in managerial, professional and technical jobs than those from other sectors.

Gender Differences in Work Conditions among entrepreneurs in the ICT and non-ICT Sectors

This section presents a descriptive analysis in gender differences among entrepreneurs, as well as a comparison between female entrepreneurs in the ICT and non-ICT sectors. For entrepreneurs, some of the work conditions we analyse in Economic Case 2, such as recognition of the institution about one´s work, do not make much sense, and as such we have restricted the analysis of work conditions to the following aspects:

(i) Satisfaction

(ii) Wages

(iii) Feeling of Work Well Done

(iv) Stress

Since the total number of records of female entrepreneurs as a whole is very low (43 observations in the ICT sector) we group all 33 countries and describe average conditions for entrepreneurs for all 33 European countries as a whole. For all of the questions, the value 1 signifies when the individual responds positively to the question (i.e. agrees or says “yes”) and zero otherwise. Therefore, even if the answer to the question is a negative one, the mean values are always between 0 and 1. These (weighted) mean values show the different experiences encountered by men and women as entrepreneurs in both ICT and non-ICT sectors. We begin by analysing each question.

(i) Satisfaction:

Regarding overall satisfaction, participants must answer how satisfied they are with working conditions in their main paid job. Almost all female entrepreneurs in ICT respond positively to the overall satisfaction in their job. This positive response is higher than that obtained for male entrepreneurs in the ICT sector (although this is also very high – 91% of positive responses), and also higher than that obtained from non-entrepreneurs in the ICT sector, as well as for entrepreneurs in the non-ICT sector. Therefore, the first issue to address is that the levels of satisfaction among entrepreneurs are higher than for other workers in the ICT sector and for other entrepreneurs in sectors other than those related to ICT sector.

(ii) Wages:

If we compute the ratio of Hourly Wages of female/male workers, we can see that it is very similar among entrepreneurs in the ICT sector (88%), non-entrepreneurs in the ICT sector (76%) and entrepreneurs in non-ICT service sectors (82%). Therefore, on average, females earn approximately 20% less than their male counterparts and this seems to be similar within entrepreneurs in the ICT and non-ICT sectors, and within the ICT sector, for entrepreneurs and non-entrepreneurs. In addition, if we compare hourly

wages for entrepreneurs in the ICT and non-ICT sector, we can see that men have a slightly higher wage in the non-ICT sectors, whereas women have a slightly higher wage in the ICT sector, although on average the differences are very small.

(iii) Feeling of Work Well Done

With regards to their work environment, participants answer a question regarding whether or not their job gives them the feeling of work well done. The answers to this question look very similar to the first one, the satisfaction level: Entrepreneurs in the ICT sector respond very positively to this question, more so than when the question is asked to non-entrepreneurs in the ICT sector. However, when we look at the responses of this question from entrepreneurs in the non-ICT sector, we also observe a very positive response. Therefore, it seems that for entrepreneurs, either in the ICT or non-ICT sectors, their job gives them a very nice feeling of Work Well Done. And this feeling seems to be similar for males and for females.

(iv) Stress:

Regarding stress, participants are asked if they experience stress at work. Within the ICT sector, entrepreneur females seem to experience more stress in their jobs. In addition, the levels of stress shown by entrepreneurs in the ICT sector when compared with others in non-ICT sectors are higher – approximately 10% more of female entrepreneurs in the ICT sector feel stress in their job when compared to their counterparts in other non-ICT sectors.

Conclusion

In summary, female entrepreneurs seem more satisfied in the ICT sector than in the non-ICT sectors, while for the most part the gender differences are quite small. With respect to hourly wages, male entrepreneurs earn around 12% more than their female counterparts, and this difference is slightly smaller than that observed among male and female entrepreneurs in other non-ICT service sectors (18% more). Comparing female entrepreneurs in the ICT and non-ICT sectors, differences are very small. Finally, the level of stress for entrepreneurs is higher in the ICT sector than in other sectors.

Unfortunately, we cannot estimate differences in the ICT sector for entrepreneurs when we consider similar workers in terms of education, age and type of firm. Indeed, this is due to the fact that the number of observations, particularly that of females, is very low. Estimates are too imprecise because of the low number of observations.

Table 15. Differences in Work Conditions – Entrepreneurs in the ICT and Non-ICT Sectors (2010)

	ICT				non-ICT	
	Entrepreneurs		non-Entrepreneurs		Entrepreneurs	
	Female	Male	Female	Male	Female	Male
On the whole, how satisfied are you with working conditions in your main paid job?						
(1=positive)	0.98	0.91	0.81	0.89	0.90	0.87
Your job gives you the feeling of work well done						
(1=agree)	0.93	0.91	0.79	0.87	0.91	0.90
You experience stress in your work						
(1=agree)	0.37	0.30	0.28	0.22	0.24	0.32
Hourly Wages						
(in Euros)	10.71	12.22	9.44	12.48	10.48	12.72
Sample Size	*43*	*183*	*336*	*691*	*824*	*726*

Annex Tables

Table A

Proportion of individuals who choose fields related to the ICT sector (data does not cover the Czech Republic and Cyprus) (2011)						
	All		Less than university		University or more	
	Male	Female	Male	Female	Male	Female
Austria	0.86%	0.30%	0.23%	0.10%	0.63%	0.21%
Belgium	2.67%	0.75%	0.45%	0.14%	2.21%	0.61%
Bulgaria	0.60%	0.57%	0.11%	0.14%	0.50%	0.43%
Switzerland	18.49%	2.52%	11.04%	1.44%	7.46%	1.09%
Germany	2.19%	0.58%	0.87%	0.22%	1.32%	0.37%
Denmark	2.86%	1.35%	1.81%	0.99%	1.05%	0.37%
Estonia	20.67%	4.37%	14.15%	1.25%	6.51%	3.12%
Spain	2.09%	0.98%	0.22%	0.04%	1.87%	0.93%
Finland	1.73%	1.15%	0.45%	0.20%	1.28%	0.95%
France	1.99%	0.68%	0.05%	0.01%	1.95%	0.67%
Greece	2.20%	1.51%	0.91%	0.82%	1.29%	0.69%
Hungary	31.49%	2.47%	27.70%	1.82%	3.79%	0.66%
Ireland	2.21%	1.51%	0.29%	0.51%	1.92%	1.01%
Italy	1.45%	1.01%	0.88%	0.53%	0.56%	0.49%
Lithuania	1.18%	0.88%	0.10%	0.12%	1.08%	0.76%
Luxembourg	4.16%	1.29%	1.18%	0.39%	2.98%	0.89%
Latvia	25.69%	3.37%	20.83%	1.99%	4.85%	1.38%
Malta	2.42%	0.72%	1.05%	0.28%	1.37%	0.44%
Netherlands	2.42%	0.38%	0.90%	0.18%	1.52%	0.20%
Poland	1.78%	0.71%	0.70%	0.23%	1.08%	0.48%
Portugal	1.15%	0.39%	0.77%	0.18%	0.38%	0.21%
Romania	32.76%	12.93%	29.12%	11.39%	3.64%	1.54%
Sweden	1.76%	0.93%	0.57%	0.40%	1.19%	0.52%
Slovenia	0.97%	0.25%	0.30%	0.05%	0.67%	0.21%
Slovak Republic	42.20%	7.58%	37.07%	6.20%	5.13%	1.38%
UK	2.58%	1.12%	0.56%	0.39%	2.03%	0.73%

Table B

Proportion of workers among those who study fields related to the ICT sector (data does not cover the Czech Republic and Cyprus) (2011)						
	All		Less than university		University or more	
	Male	Female	Male	Female	Male	Female
Austria	90.80%	76.34%	79.26%	66.67%	94.95%	80.95%
Belgium	83.81%	75.29%	68.46%	63.83%	86.95%	77.88%
Bulgaria	80.95%	77.05%	45.45%	26.67%	88.46%	93.48%
Switzerland	91.92%	77.76%	90.12%	77.33%	94.59%	78.33%
Germany	90.29%	81.52%	86.67%	76.47%	92.68%	84.48%
Denmark	84.94%	78.51%	84.03%	76.94%	86.49%	82.74%
Estonia	79.80%	75.50%	77.59%	64.65%	84.58%	79.84%
Spain	77.99%	74.93%	50.00%	53.33%	81.31%	75.88%
Finland	86.28%	82.79%	72.09%	67.57%	91.32%	85.96%
France	84.34%	77.13%	71.62%	50.00%	84.65%	77.66%
Greece	78.51%	56.86%	71.34%	48.33%	83.55%	67.11%
Hungary	70.41%	57.02%	69.05%	52.53%	80.36%	69.48%
Ireland	78.94%	66.37%	46.63%	50.26%	83.80%	74.44%
Italy	76.06%	67.31%	74.72%	58.19%	78.16%	77.11%
Lithuania	87.15%	89.15%	63.64%	73.33%	89.43%	91.76%
Luxembourg	86.36%	73.91%	73.33%	53.57%	91.53%	82.81%
Latvia	73.84%	69.01%	72.10%	61.48%	81.32%	79.88%
Malta	89.66%	84.75%	82.95%	73.91%	94.78%	91.67%
Netherlands	90.35%	73.98%	83.45%	67.80%	94.46%	79.69%
Poland	80.90%	69.80%	67.00%	58.77%	89.88%	75.11%
Portugal	71.75%	80.77%	65.18%	71.28%	85.11%	88.60%
Romania	69.29%	54.46%	67.79%	51.88%	81.29%	73.53%
Sweden	85.98%	86.20%	77.02%	81.57%	90.28%	89.76%
Slovenia	82.38%	69.64%	64.06%	40.00%	90.41%	76.09%
Slovak Republic	75.05%	59.82%	74.06%	56.82%	82.25%	73.27%
UK	80.09%	73.77%	64.63%	66.96%	84.33%	77.36%

Table C

Proportion of Workers in the ICT sector among workers who study fields related to the ICT sector (data does not cover the Czech Republic and Cyprus) (2011)						
	All		Less than university		University or more	
	Male	Female	Male	Female	Male	Female
Austria	33.41%	12.68%	29.91%	10.00%	34.45%	13.73%
Belgium	33.47%	16.67%	14.71%	6.67%	36.49%	18.52%
Bulgaria	31.37%	17.02%	20.00%	0.00%	32.61%	18.60%
Switzerland	9.87%	11.62%	4.66%	9.77%	17.21%	14.04%
Germany	39.41%	21.33%	36.75%	23.08%	41.05%	20.41%
Denmark	27.74%	11.32%	21.57%	9.51%	38.04%	15.83%
Estonia	4.81%	1.91%	1.08%	0.00%	12.23%	2.53%
Spain	32.93%	21.43%	17.95%	0.00%	34.02%	22.09%
Finland	14.84%	8.43%	17.74%	8.00%	14.03%	8.50%
France	33.11%	18.04%	24.53%	18.18%	33.28%	18.04%
Greece	12.10%	6.40%	7.71%	5.46%	14.74%	7.21%
Hungary	3.02%	4.07%	1.49%	2.30%	12.59%	7.78%
Ireland	35.83%	17.02%	12.37%	2.11%	37.79%	22.06%
Italy	21.55%	9.05%	17.61%	8.11%	27.47%	9.81%
Lithuania	29.03%	9.52%	0.00%	9.09%	31.03%	9.58%
Luxembourg	17.11%	11.76%	16.36%	6.67%	17.34%	13.21%
Latvia	3.19%	4.91%	1.04%	1.33%	11.37%	8.89%
Malta	42.86%	34.00%	35.62%	17.65%	47.71%	42.42%
Netherlands	33.76%	13.19%	28.10%	0.00%	36.74%	23.53%
Poland	20.42%	7.35%	8.33%	3.98%	26.24%	8.61%
Portugal	14.18%	10.12%	9.24%	8.96%	21.88%	10.89%
Romania	2.61%	1.97%	1.11%	0.67%	12.64%	8.73%
Sweden	33.89%	23.91%	26.09%	17.92%	37.09%	28.08%
Slovenia	36.99%	2.56%	29.27%	25.00%	39.39%	0.00%
Slovak Republic	3.90%	4.22%	1.53%	1.86%	19.30%	12.43%
UK	26.33%	9.21%	7.37%	1.33%	30.31%	12.80%

Table D. Labour Market Distribution of individuals who undertake education in Statistics, Maths, Computing and Engineering – By Age and Gender

Out of those women who study ICT-related fields (data does not cover the Czech Republic and Cyprus) (2011)							
		Sweden	Germany	UK	Italy	Poland	Latvia
Less than 30 years old	% work in ICT	12.73%	20.00%	7.50%	10.91%	13.71%	12.50%
	% work in non-ICT service sectors	30.91%	50.00%	32.50%	16.36%	34.52%	43.75%
	% work in other sectors	16.36%	20.00%	27.50%	10.91%	22.84%	21.88%
	% don't work	40.00%	10.00%	32.50%	61.82%	28.93%	21.88%
30-44 years old	% work in ICT	31.91%	21.43%	15.00%	9.62%	4.98%	12.20%
	% work in non-ICT service sectors	51.57%	46.43%	63.75%	56.57%	73.18%	26.83%
	% work in other sectors	10.26%	21.43%	7.50%	19.25%	13.79%	43.90%
	% don't work	6.27%	10.71%	13.75%	14.55%	8.05%	17.07%
45 years or older	% work in ICT	19.89%	11.11%	5.62%	5.09%	2.42%	3.19%
	% work in non-ICT service sectors	51.93%	44.44%	53.93%	65.51%	47.98%	38.30%
	% work in other sectors	17.68%	22.22%	13.48%	7.18%	10.48%	37.23%
	% don't work	10.50%	22.22%	26.97%	22.22%	39.11%	21.28%
Out of those men who studied ICT-related fields (data does not cover the Czech Republic and Cyprus) (2011)							
		Sweden	Germany	UK	Italy	Poland	Latvia
Less than 30 years old	% work in ICT	36.84%	25.00%	26.55%	26.42%	23.56%	21.21%
	% work in non-ICT service sectors	30.36%	35.42%	34.51%	11.40%	19.03%	20.20%
	% work in other sectors	18.62%	27.08%	20.35%	6.74%	40.41%	44.44%
	% don't work	14.17%	12.50%	18.58%	55.44%	17.00%	14.14%
30-44 years old	% work in ICT	37.22%	45.05%	28.14%	27.37%	24.17%	10.34%
	% work in non-ICT service sectors	35.97%	24.18%	36.80%	34.02%	32.92%	15.52%
	% work in other sectors	21.11%	28.57%	27.27%	28.90%	39.72%	61.21%
	% don't work	5.69%	2.20%	7.79%	9.72%	3.19%	12.93%
45 years or older	% work in ICT	23.91%	44.23%	21.71%	16.71%	21.64%	4.52%
	% work in non-ICT service sectors	42.55%	19.23%	34.86%	46.12%	39.77%	18.06%
	% work in other sectors	18.01%	25.00%	18.29%	15.29%	23.98%	54.84%
	% don't work	15.53%	11.54%	25.14%	21.88%	14.62%	22.58%

ANNEX III. CODE OF BEST PRACTICES: STATUS AND ASSESSMENT

Methodology

The European Code of Best Practices for Women and ICT aims to solve the ICT skills gap problem in Europe and also to retain and promote women who are already in the sector. The European Commission launched this programme, intended as a guide to best practice, in 2009 and to date it has been signed by 59 companies and associations from the ICT sector. The Code is available on this website: http://ec.europa.eu/digital-agenda/en/news/code-best-practices-women-ict

The Code proposes different measures and activities for reaching its objective. These actions are organised under 4 different categories: Education, Recruitment, Career Development and allowing for work/family balance (including returning to work after leave). Indeed, it covers all "crucial times" in the election and development of a career.

We contact the signatories of the Code, in order to assess the progress of these organisations regarding Women in ICT since the Code was signed. The aim is to identify specific measures launched among those proposed by the European Commission.

To complete this task, an open questionnaire (which can be seen below) with 4 questions is designed. For those whose contact information is missing, an Internet search is carried out. Finally, 56 signatories are addressed, and the survey is sent. Among the organisations contacted 6 completed surveys are received. In addition 5 responses are received refusing to participate in the survey due to various reasons (lack of capacity for developing the activities included in the Code and therefore impossibility to report them, closing down of the organisation, lack of information about the Code, etc.).

On the basis of the results of the survey and the findings from our research a reform of the Code of Best Practices is proposed below.

Survey for the signatories of the Code of Best Practices for Women and ICT

As you probably know, your company is one of the signatories of the code of Best Practices for Women and ICT (hereinafter the Code). DG CONNECT recently commissioned a study about women in the ICT sector to our company Iclaves, and one of the tasks is to assess the progress of the organisations who are the signatories of the Code.

The signature of the Code does not create any legal obligation or liability – we are trying to assess to what extent such an instrument can be an effective tool.

1. Could you tell us if your company has developed or introduced specific measures since the signature of the Code in the following areas (if yes, please describe briefly):
    a. For attracting more women to study ICT?
    b. With the aim of recruiting more women to your company?
    c. To avoid women leaving the company and/or the sector?
    d. To increase the number of women in managerial positions?
    e. To facilitate the balance between personal and professional life?
    f. To facilitate the return of women to work after maternity leave?
2. Could any of these measures be considered as a best practice? If so, please describe it in further detail and explain briefly why it could be considered as such.
3. Would you be interested in including this case in our current study? If so, please provide a contact person who can provide further information.
4. Has your company started to gather gender statistics within the company? (If yes, are they available to the public or for this assessment? Data can be kept anonymous.

General conclusions

Due to the low number of surveys completed it is not possible to make a general conclusion regarding the application of the Code among its signatories. However, it is remarkable that all of the companies which have sent the completed questionnaire report the use of flexible working conditions. It is also significant that three of them develop activities in universities and secondary schools to increase the number of women studying ICT or entering ICT companies. The largest companies also report training programmes which have been developed to provide the business skills necessary to increase the number of women amongst board members.

One of the most relevant initiatives reported is SAP's "Stay-in-Touch". The programme helps employees stay connected with the company during parental leave. The programme provides information to employees who are on leave regarding changes and developments in their department, and the SAP organisation as a whole. Furthermore, they also have mentors who provide regular communication and information exchange in order to facilitate the process of returning to work. These kinds of initiatives are considered very important when it comes to avoiding the "leaky pipeline" problem, identified as one reason behind the low number of women in the ICT sector.

In any case, taking into account the low number of responses and the difficulties experienced when attempting to contact the person in charge of its implementation, or even an employer who knew about the company's signature, it is possible to state that the Code is not achieving the expected results.

The following is a proposal for a programme which addresses both the low response rate as well as the poor adoption of the Code.

Proposal for reforming the Code: "ICT Diverse Workforce" label

The European Code of Best Practices for Women and ICT (hereinafter 'the Code') outlines practices for organisations in order to increase the number of women entering, and retain those already in, the ICT sector.

However, when the signatories of the Code are prompted to disclose information regarding their progress on this issue, less than 10% respond. This reveals the need for more effective monitoring practices with stronger incentives for participation.

In practice it is impossible to measure the impact of the Code, since there is no monitoring or evaluation mechanism. However, it is clear that the Code has low visbility, even among the signatories themselves, and there is no effective management of the initiative.

The Code should be reformulated and we suggest the creation of a voluntary certification and incentives package which comes with it, in the shape of a "European label".

The label would be part of a wider programme which should include:

- The label.
- A network of organisations.
- Annual awards for best initiatives (best practices).
- An exchange platform for best practices.
- A showcase for role model and other complementary initiatives.

The label itself, the centre of the programme, would identify those organisations which have undergone an evaluation process and have been distinguished by its commitment to the values of the programme.

The remaining activities, which will help in achieving the goals of the programme, will complement the label and will help to attract more organisations.

This proposal advocates for a shift in the approach to the problem from a scheme based on the dissemination of *initiatives to ensure greater participation of women in all areas of the sector*[126] (means) towards the recognition of results (objectives).

The exchange of best practices, networking and advisory activities would be complementary. The label should reward the work and dedication of those organisations truly implementing gender equality measures in the ICT sector and getting results within their own structures.

[126] European Code of Best Practices for Women and ICT, 2009.

Paramount to the success of this programme would be the excellence criteria. While the visibility and public awareness of the label are important, the label should also carry some responsibility. As a result, the evaluation process should be accurate and the label should be issued to organisations which truly deserve it.

For the success of the label two main issues should be taken into account:

- **The simplicity of the application process:** in order to encourage acceptance of this voluntary programme it is important to minimise the effort which must be exerted by the organisation.
- **The incentives for organisations to participate**: the programme should offer enough incentives for organisations to participate. Moreover, the EC should disseminate the label with the objective of creating a collective awareness regarding the importance of the label, thus resulting in social pressure so that they want to have it.

The certification to obtain the label should be valid for a maximum **period of three years**, after which time the label would expire and renewal would be mandatory to continue being part of the programme and using the label (logo).

Description of the proposed programme

Objectives and evaluation criteria

We are of the opinion that the objectives of the current code should be revised and adapted to the new functioning of the programme. However, it is important to note that, in general, the terms are valid and should be maintained:

Signatory European and International stakeholders now propose together a Code of Best Practices for Women in ICT that reflects recent positive developments and seeks to be a rallying point for other stakeholders wishing to support and promote the greater participation of women in the sector. The Code aims not only to ensure that more women choose careers in the sector but also that they are encouraged and supported to remain and progress in their chosen area of work. This code will be subject to national and international practices.

The Code covers different areas of practices, namely: Education, Recruitment, Career Development, and Return to work after leave. The practices, based on input from the signatories are listed in the Annex.

The label will award the commitment of organisations in those areas of practice by evaluating qualitative and quantitative indicators. These indicators will refer to internal and external practices of the organisation.

- **Quantitative indicators:**

- Internal: data regarding the situation of women within the organisation will be assessed, such as the number of women in technical positions, the number of women in managerial positions, number of women returning to work after maternity leave, number of training courses received, increase in results over time, etc.
- External: external data refers to activities conducted by the organisation addressing external stakeholders, such as students, researchers, families, etc. E.g.: number of students participating in an event.

- **Qualitative indicators:**
  - Internal: an internal review will be conducted, with a focus on the quality and impact of initiatives and plans of the company to increase the number of women amongst its workforce and management, improve the balance between family and work, talent management and retention mechanisms, etc. In addition, the satisfaction and perception of its employees with these policies and practices will be assessed. Employees will also identify barriers and drivers for improvement and make suggestions.
  - External: the quality and impact of initiatives targeting external stakeholders will also be evaluated. From the employee side, the general image of the organisation regarding gender issues will be assessed.

The evaluation of the offer will be based on the following criteria:

- **Quantitative indicators**: the current situation of women within the company and, particularly in technical and managerial positions, will be considered. Progress will also be taken into account, especially with regard to renewals of the label. **Weighting 40%**
- **Qualitative indicators**: the scope, impact and quality of programmes and initiatives, both in progress and those which are planned, will be evaluated. **Weighting 30%**
- **Employees' perceptions: weighting: 30%**

In concurrence with the recognition of the activity and commitment of the organisation as a whole, the programme could include the selection of **certain initiatives to be awarded as best practices** and used as a reference or model for the whole sector.

Applicants

All European organisations of the ICT sector will be welcome to apply to obtain the label.

Those organisations proving to comply with the objectives and values of the label will be given a certificate and will be entitled to use the label (logo). The label will be awarded on a temporary basis, and should be **renewed every three years**. This should incentivise the implementation of monitoring mechanisms and a long-term commitment among the participating organisations.

Incentives package

- **Recognition: create value for the organisation.**

  The label would include a logo, or some sort of distinguishing mark for these organisations to use.

  This serves two purposes. First, companies which have this logo would then be able to distinguish themselves from competing companies when it comes to selling or advertising their products or services. Second, it allows for these companies to then distinguish themselves when it comes to attracting prospective employees. Adding a logo which is visible and recognisable to the public adds an extra layer of oversight.

- **Visibility**

  Organisations awarded with the label will be part of all communication campaigns and events organised by the programme.

- **Support and advisory services**

  In collaboration with selected partners from the 3rd sector, the EC would offer advisory services for those organisations participating in the programme.

- **Networking**

  Organisations with the label are listed in a catalogue and will be part of the label Community.

- **Inclusion of the label as evaluation criteria for public procurement or public funding programmes**

  Organisations with the label could be awarded extra points in the evaluation criteria for certain public procurement processes at the EC and Member States levels or public funds (grants, or funding schemes) could be allocated. This could be potentially the largest incentive, particularly for SMEs which wish to expand but suffer from a lack of brand recognition.

These are all factors which can help organisations by increasing brand scope and reputation.

Organisation and structure

The management of the programme should be centralised in one organisation with sufficient visibility.

The management team should be easily identifiable by all stakeholders and its contact details available to the public.

The application and evaluation process must be **transparent:** principles, objectives, evaluation criteria, applicants and all other relevant information about the programme must be public and periodically updated.

Although the programme must have one single contact point and one management unit, the design, monitoring and implementation of the programme must take into account all relevant stakeholders, particularly sector associations and civil society.

3rd parties should become partners and take an active role in 4 main activities:

1. Guiding and supporting organisations through the application process.
2. Advising the organisations in lower stages of development (see next section below).
3. Offering support to all applicants on how to maximise the benefits of the label.
4. Disseminating the label and creating a "demand".

These are very important aspects of the label. First, this collaboration essentially diverts the bulk of the work from the EU, to other bodies which are more apt to respond to issues during the application. It also reduces the difficulty of the application. If organisations feel that the application is too difficult, then they may not be motivated to apply. Finally, offering advice on how to market the label to consumers/workers helps organisations understand both the importance, and the practicality of the label. The important thing to note is that these labels can differentiate organisations, although if they are not marketed properly they will have little benefit[127].

This is also crucial when it comes to incorporating this into the framework of the label programme, specifically aid regarding how to utilise the label. The objective is to motivate organisations which receive the label to flaunt it. The label must be on display in order to be effective. This must be done in order to create value to both citizens and organisations.

However, the award of the label and the supervision of the certification process should be the responsibility of one single unit/organisation. Dilution of authority would threaten the reliability of the label and its impact.

Process of implementation and certification

[127]Use of food labelling: http://www.psi.org.uk/pdf/2011/food_labelling/annex_a.pdf

All application processes and management of the label programme must be based on an online platform which facilitates all procedures both for the applicants and the management authority/unit. The website should ideally be available in all of the Union's languages.

The first application to the programme will consist of 2 online surveys:

1. **One survey for the organisation;** including quantitative data about the organisation and qualitative information on the organisation's policies and initiatives in place.
2. **One possible survey for employees (spot-check);** with questions pertaining to job satisfaction, the work environment and employee benefits packages. This survey will be anonymous.

The proposed application process will be as follows:

1. **Judging Eligibility:** organisations which are interested in applying will go online and review information about the programme, such as requirements, application process, guidelines for qualification, etc.

2. **Getting Advice:** Organisations can then fill out a form on the website declaring their intent to apply. This form asks for simple background information relating to the organisation (company contact name, phone number, email, location of organisation, etc.). An advisory partner (3rd sector) provides advice and guidance.

   Organisations will create an account with a website, which will be the main form of communication between them, their adviser, and the EC representative. This account will also store all required documents (which the organisation can scan, or upload to the website).

   This step will not be mandatory.

3. **Application Procedure:** organisations will start the application survey by filling in an application form with basic information on the organisation.

4. **Surveys:** This is the stage when the organisation actually administers the surveys, completes them, and submits them online. Additional information from the organisation's management might be requested (e.g. formal documents supporting the information provided by the organisation).

5. **Ranking awarded:** Regardless of a company's score, a summary of results can be submitted to management. Based on a company's score, they will either receive the label and the right to use it, or they will receive a "care-package". This package is a summary of the survey results, along with written materials and the contact of one of the programme's advisory partners.

6. **Renewal:** Follow up surveys would ideally be conducted every three years. After labelling, representatives will inform organisations of

when they must renew their application. Representatives reserve the right to conduct random on-site inspections, although this should be done on a needs basis, so as to preserve the integrity of the label.

The renewal of the label will consist of an updating of the managerial survey and a shorter version of the employees' survey, so as to facilitate continuity and make the process easier for organisations willing to maintain the label.

After this process is complete, with all responses and data analysed, companies would be divided into 3 tiers.

a. Organisations in an inception phase:

Organisations with poor scores (few women in management positions, few women in technical positions, few initiatives in place, low female job satisfaction, high levels of women leaving the organisations, etc.) will be invited to participate in a peer learning programme with the best achievers.

This programme designed and implemented by partners from the 3rd sector in collaboration with the EC, will include advice services and working materials, such as: advice regarding recruitment practices, current employee practices, practices to improve employee retention, and analysis of the workplace environment.

The aim of this tier is to reward a company for applying and complying with the programme despite poor performance. It also functions somewhat as a tool to attract more organisations, and provides a direction and model for future companies to use when they prepare to apply.

b. Complying organisations: Label

The second tier of organisations would be comprised of organisations that meet all requirements and are working in the right direction.

These organisations get labelled and can use the label with all its benefits.

c. Best practices: Golden Label

The third tier is for model organisations. These are the organisations which are able to show a stellar combination of employee benefits, support for women (and all other employees), high job satisfaction, and a large (or above average) level of female participation. This company would ideally have female involvement in senior management, or exceedingly positive reviews of the senior management.

This category may also include those organisations obtaining the label 3 or more times in a row or showing high levels of improvement in a short period of time.

These organisations would receive the label, although with some form of differentiation (a gold star, check mark, plus sign, etc.).

They would be used as best practices by stakeholders and would be invited to all events organised by the programme, getting as much visibility as possible.

Additional benefits may include:

- Preference in the creation of consortia and networks.
- Special visibility in the online platform.
- Priority (extra points in some criteria) for certain financial incentives programmes.

Other relevant issues

Communication and marketing

To supplement the establishment of this programme, there is some need to establish a media campaign to promote public awareness and understanding of this label[128] whilst also guaranteeing transparency.

In addition, this programme should have a strong and well-maintained Internet presence. This would include the main webpage, which is also the tool for the management of the project. This page should also contain all necessary information about the programme (objectives, application process and criteria), as well as recent news. However, this website should be accompanied by a social media campaign using outlets such as Twitter, Facebook, and YouTube.

Other benefits to participants

The programme should not add a significant amount of extra work for either the EU or the organisations involved in this program. Moreover, it should be a programme which is beneficial and helpful to organisations in a way which extends beyond financial factors. The first suggestion is to return a copy of the results of the employee survey to the company. This would allow for internal reviews by senior management or HR departments. Ideally this process should function in a similar way to an internal review which many large companies already conduct within their HR departments and which has become a useful internal tool for organisations.

Coordination with existing initiatives

[128] Source: Nguyen, L.Q & Du, Q (2010): *Effectiveness of Ecolabel? A study of Swedish University Students' Choice on Ecological Food.* http://umu.diva-portal.org/smash/get/diva2:327644/FULLTEXT01.pdf

Existing studies on labels warn against the current saturation of labels in the market. This highlights a need to correctly inform citizens and to coordinate with existing initiatives.

One of the potential initiatives with synergies with the proposed programme is *Great Place to Work®*[129], by creating a category "Best ICT places to work for women", for example. Other initiatives to consider include the initiative from *Opportunity now*[130], from the United Kingdom, *The Times Top 50 Employers for Women 2013*, or the European CSR Awards[131] from CSR Europe and supported by the European Commission.

Image 1. Announcing the 100 best places to work in Europe 2013

Source: www.greatplacetowork.com

[129] http://www.greatplacetowork.net

[130] http://opportunitynow.bitc.org.uk/thetimestop502013list

[131] http://www.europeancsrawards.eu/

ANNEX IV. CASE STUDIES

Best practices have been analysed to identify programmes and measures used in Europe by companies and institutions of the ICT sector to increase women's participation.

Three cases included the study commissioned by the European Commission in 2006 "Best practices for even gender distribution in the 25 member states in the domain of Information Society" have been reviewed to monitor the impact of the measures implemented and follow the progress of the organizations' policies.

Besides, three new cases have been identified and analysed, in order to identify best practices that can be scaled to other organizations.

Additionally to desk research, interviews with people in charge of these programmes have been carried out for obtaining first-hand information about the main achievements, successful measures and problems identified.

Review of existing case studies

Case 1. Leibniz Universität Hannover

Name / Title	Leibniz Universität Hannover
Organisation	Leibniz Universität Hannover
Country	Germany
Area of Action	Education/ research
Target	Students, researchers, employees
Objectives of the initiative / Programme	
The objectives of Leibniz Universität Hannover regarding gender equality are: 1. The increase of female proportion in areas in which women are under-represented (Mainly ICT and natural sciences) 2. Improvement of the working and studying situation regarding equal working- and studying conditions. 3. Integration of gender mainstreaming into academic politics.	
Brief history / Background information	

Although German laws favour gender equity[132] cultural issues still prevent woman from participating equally in the ICT sector, particularly from staying in their job after pregnancy.

Leibniz Universität Hannover has established structures for gender equality since 1991. According to the study from 2006 the main element of its policy has been the establishment of the gender equality commissioner and its office for gender equality in the University.

They mainly support the female scientific offspring, working against established restricted choice of profession by female pupils in schools, support the female science assistance, help female university alumnus with their career entry and provide university employees and students with alternative childcare possibilities.

Main tools / Methodology

For achieving their objectives Leibniz Universität Hannover has developed actions in the following areas:

- String focus on awareness, mentoring and dissemination at schools
- Specific post-doctoral programmes for women
- Children care support for students and professors
- Mentoring and specific training courses for university students

One of the most successful initiatives is the Caroline Herschel Programme, which aims to increase the number of young women scientists in those areas where the representation of women has so far been less than 20%. The programme offers highly qualified applicants the prospect of employment for 5 years to develop a scientific perspective. Today more than ten former candidates are professors on chairs at universities and colleges, many of them work in leadership positions in economic companies and concerns.

Another successful initiative is the support for the completion of PhDs delayed for family reasons. Leibniz Universität Hannover has a long-established funding programme for scientists who have not been able to complete their doctorate for family reasons. This programme funds a half-time position for a maximum of six months to enable the candidate to complete their PhD. So far about 60 women and 15 men were supported by the programme.

Monitoring and evaluation system

The main periodical evaluation at Leibniz Universität Hannover is the report on the gender equality plan, which has been developed in 2008 and 2011. On the other hand, the programme for Women Professors has its own monitoring.

Furthermore, Leibniz Universität Hannover has participated on the Statement on the implementation of research-oriented standards on gender equality

[132] In all Länders for example universities are obliged to incorporate a gender equality commissioner.

developed by the Executive Committee of the German Research Foundation for illustrating the ways they offer equal opportunities for successful professional development to both men and women; on the Evaluation of the implementation of the recommendations of the German Rectors' Conference to assure an improved participation of female scientists at every level of the scientific system; on the study for determinants of gender segregation at Universities and on the University ranking according to aspects of gender equality.

Progress: main achievements

Despite the fact that the total number of female students increased since 2007, they represented 10% of all students in the Faculty of Electronics and Informatics in 2012. This is 1.4% less than in 2007, but due to the measures implemented, Leibniz Universität Hannover expects that by 2013 16% of its students are female. On the contrary, the number of PhDs has increased from 0 to 4, which represents 12% of all PhD graduates.

Furthermore, Leibniz Universität Hannover has a strong commitment on increasing the number of women among the professors at the Faculty of Electronics and Informatics and has set ambitious targets. For example, they aim to increase the percentage of female junior professors from the current 0% to 25% and the number of female professors from 5% to 10% by the end of 2013 and therefore extrapolate the tendency followed by the University as a whole, where the percentage of female professors has reached 27.2%

Table 1. Female participation in Leibniz Universität Hannover

	2007		2009		2012		Target
	Total	%	Total	%	Total	%	%
Female Students	9,016	44.7%	8,573	43.1%	9,108	40.7%	45%
Female PhDs Graduates	99	32.5%	121	33.5%	108	30.2%	36%
Female researchers and PhDs students			944	34.9%	1,030	35.6%	38%
Female Junior Professors	10	38.5%	6	24%	5	17.2%	40%
Female Professors	18	17.5%	19	19.6%	25	27.2%	30%
Female Senior Professors	22	13.5%	28	15%	37	18.1%	20%

Source: Abschlussbericht Leibniz Universität Hannover. *Forschungsorientierte Gleichstellungsstandards der Deutschen Forschungsgemeinschaft* (2013)

Table 2. Female participation in the Faculty of Electrical Engineering and Computer

Science

	2007		2009		2012		Target
	Total	%	Total	%	Total	%	%
Female Students	166	11.4%	152	10.2%	195	10%	16%
Female PhDs Graduates	0	0%	2	5.7%	4	12.1%	10%
Female researchers and PhDs students			37	10.7%	36	11.2%	
Female Junior Professors	2	40%	2	40%	0	0%	25%
Female Professors	0	0%	0	0%	0	0%	25%
Female Senior Professors	2	10%	2	8.7%	1	5%	10%

Source: Abschlussbericht Leibniz Universität Hannover. *Forschungsorientierte Gleichstellungsstandards der Deutschen Forschungsgemeinschaft* (2013)

Progress: Problems identified

Leibniz Universität Hannover has numerous measures to attract students to STEM degrees, specifically addressing female pupils and high-school graduates. However, so far, participation has not increased to the desired extent. The reasons for the low impact of the measures established is being analysed by the University and there is not information available at this regard at this moment.

The goals were established in 2009 with the first statement on the implementation of research oriented standards on gender equality. They were evaluated and reviewed for the first time within an interim report in 2011. It should be noted that these objectives are very ambitious, particularly considering the starting point.

New/Corrective measures

Some new measures have been implemented since 2006:

In the STEM area:

- MUT Mädchen-und-Technik-Kongress for schoolgirls: this conference aims to attract more girls to STEM subjects. A variety of projects, experiments, technology challenges and discussions with experienced women as role models is offered to schoolgirls on this day. This congress has been organised every November since 2009.
- FeminIng Initiative for students: this is a project by students for students in the field of engineering. They offer networking, skills

training etc.

- Niedersachsen-Technikum for female high-school graduates: This programme, addressing young women who have just left school, aims to attract young female academics to study STEM subjects. It offers six months of practical training in regional companies together with attendance at selected lectures at Leibniz Universität Hannover. First-hand knowledge of a specific field of work enables participants to make a more informed career choice.
- fiMINT: is a project that helps young women in the STEM subjects to plan their careers, to identify and to achieve their professional goals. There are workshops, coaching, advice, inter- and multidisciplinary networking and activities in cooperation with regional companies.
- Femtec: Leibniz Universität Hannover participates in this national career-building programme for female students of natural sciences and engineering. On the one hand the programme offers training in soft-skills and management. On the other hand the programme provides contact to the participating international companies for industrial placements or even career entry.
- Dual Career Couples Network: Leibniz Universität Hannover supervises and coordinates the Dual Career Network that provides support and assistance for dual-career couples from science and industry making a fresh career start in and around Hannover.

In the University as a whole:

- Diversity Management: Leibniz Universität Hannover has joined the German “Charta der Vielfalt” (Diversity Charter) and drawn up a concept for diversity management. Helga Gotzmann, Equal Opportunities Officer, heads a mixed team from a variety of faculties, departments and service centres, charged with initiating the process of diversity management.
- Visiting Professor for Gender and Diversity: The institution of the Visiting Professor for Gender and Diversity in Leibniz Universität Hannover serves to strengthen the interdisciplinary perspective and awareness on gender issues. The visiting professor brings the current standards of research in women’s and gender studies to those fields which have not previously focussed on this. The visiting professorship is part of the early career support programme.
- Family Service: In all areas and at all levels, students and employees with children, with dependants in need of care or with other family commitments should receive assistance. Leibniz Universität Hannover offers emergency back-up care for children, childcare, nursery school, assistance in finding childcare, and advice for persons with dependants in need of care etc.

Key success factors

In view of the statistics provided by the University, the most successful programmes put into place are the ones addressing PhD students, which have allowed for an increase in the number of doctoral students, scientific staff and number of doctorates.

Findings and recommendations

A great number of initiatives have been implemented before and after 2006 at Leibniz Universität Hannover to increase its number of female students and female staff. Although there have been a lot of improvements at the regard of women in higher management levels of the University, results in STEM area have not been as positive as expected.

The case shows the importance of putting into place an evaluation mechanism that allows identifying success and failure factors and the need to implement measures at different levels, particularly at governmental and industry levels, that complement the efforts of educational and research institutions.

Case 2: Malta University

Name / Title	Gender equality policy in the University of Malta
Organisation	Malta University
Country	Malta
Area of Action	Education
Target	Students and employees of the University. They also develop activities to encourage Maltese girls to choose ICT-related degrees.

Objectives of the initiative / Programme

The objectives of the gender equality strategy are twofold: to increase the number of women studying computer science and technology and to increase the number entering the academic and research careers.

The gender equality policy of the University of Malta has three main pillars:

1. Facilitate domestic responsibilities: promotion of more flexible study and work arrangements for parents.
2. Monitor gender equality: gathering statistics of job applicants and consultations with groups representing employees and students. Results are used to improve the way the services are provided and to implement new policies.

   Facilitate recruitment: design of good practice promotion and selection criteria and procedures.

Brief history / Background information

In the last few years the Government of Malta has launched relevant programmes to increase the number of women among the workforce and has also promoted measures to facilitate their integration in companies and organizations. Among other policies, the Government is encouraging telework and part-time work.

The University of Malta, as a public institution, has implemented those measures.

The study commissioned by the European Commission in 2006[133] identifying best practices in Europe in the domain of Information Society analysed the case of the University of Malta and its efforts to attract female students and professionals to the sector.

According to the report, in 2005 females represented 57% of all registered students at the University of Malta.

[133] European Commission (2006): *Best practices for even gender distribution in the 25 member states in the domain of Information Society.* Brussels

In the Faculty of engineering, 20% women participated in the bachelor course, 11% in the master and there were no women amongst the 5 PhD students.

The board of studies for Information Technology retained 18% women in bachelor courses and 13% in master.

Main tools / Methodology

The Gender equality policy in the University of Malta aims to raise awareness, organize mentoring schemes and implement an anti-harassment policy.

The definition and implementation of gender policies is managed by the Gender Issues Committee (GIC), set up in 1991 with the aim of focusing on gender issues. This Committee works closely with the Human Resources Department.

The main measures implemented at the University level regarding gender issues are the following:

- Measures against discrimination and sexual harassment.
- Participation in projects on gender equality: The GIC participates in different events and research projects related with the gender digital divide and gender in science.
- Career development and promotion of women in the ICT sector: The GIC organises workshops, seminars and other events.
- Promotion of role models: The GIC uses internal and external media to promote the activities and success of women researchers in the University.
- Childcare services: the University has a childcare service for students and staff.

One of the most important initiatives of the GIC is its mentoring scheme. This initiative aims to reach out to students at the crucial decision-making stages in their students' lives and helping them to have the confidence to continue in their chosen field of study.

Monitoring and evaluation system

The University publishes annually statistics on the students and graduates by gender, which are publicly available.

(http://www.um.edu.mt/about/uom/facts)

The Gender Issues Committee commands periodical reports on various topics.

One of the last reports carried out reviewed the situation of female lecturers and senior professors. This last study focuses in the problems that female professors have maintaining a work-life balance and developing their careers. The objective of the study is to inspire young women and provide role models.

Furthermore, the University has elaborated a study about career development of the staff, including female and male employees.

All the studies and statistics related to gender issues are public and are introduced during a seminar held annually at the University.

Progress: main achievements

In the University as a whole, measures implemented have allowed for an increase in the number of women un high positions at the University. At this moment, there are 3 female deans out of 14 faculties.

However, the impacts of the implemented measures are not yet visible in the ICT Faculty, where there are no senior female professors. University and Faculty officials believe that it is still soon to see the effects of the measures at the senior level because university careers are very long.

At the ICT Faculty the number of female students has increased significantly. Since 2007 the number of female students augmented 11.8%, while male students decreased 1.8%. This results in a net difference of 13.6%. In 2007 female students represented 19.3% of ICT students and 21.4% in 2011.

Table 1. Evolution of number of students in the ICT Faculty 2007-2011

	Female Students	Male Students	Total
2007/2008	68	284	352
2011/2012	76	279	355
Variation	11.8%	- 1.8%	0.8%

Source: Facts & Figures, University of Malta (2013)

The number of female graduates has also increased (by 27.8% from 2007). However, their share of the total number of graduates has decreased from 24.6% of all graduates in 2007 to 22.1% in 2011, due to the significant increase in male graduates (an increase of 52.8%).

Table 2. Evolution of number of graduates in the ICT Faculty 2007-2011

	Female Graduates	Male Graduates	Total
2007/2008	18	53	73
2011/2012	23	81	104
Variation	27.8%	52.8%	42.5%

Source: Facts & Figures, University of Malta (2013)

Progress: Problems identified

Results are being achieved slowly. There are still relevant cultural barriers and stereotypes in Malta around the role of women in society and around the ICT sector which prevents women form choosing ICT related degrees.

Regarding the professional career of women at the University, results from latest measures (telework and flexible schedules) are expected to be seen in

the following years.

New / Corrective measures

Government measures to improve female participation in the Maltese workforce have been implemented in the University of Malta. Namely, the University has introduced telework measures this year.

No other relevant measures regarding gender and ICT have been implemented since 2006.

Key success factors

The programmes implemented by the Government to increase female participation in the workforce are a key driver for change in the Malta University.

The introduction of flexible working conditions has been key for increasing the number of female staff in the University, and particularly for guaranteeing the return of women after their maternity leave.

It is also expected that teleworking measures will provide good results but it is still too soon to make an assessment of this measure.

Findings and recommendations

Currently, there are not specific measures regarding gender equality in the ICT area at the Malta University. Main measures in place result from the transposition of governmental measures and apply to the whole University.

Efforts from recent years have had an important effect in the number of female students and graduates in the ICT Faculty, that although are still low, have increased 11.8% and 27.8% respectively in 4 years. The higher participation of women in ICT studies is expected to result in the increase of women among its working staff, particularly professors, in the next years.

Case 3: Motorola Poland

Name / Title	1. Women's Career development 2. Educational Diversity project
Organisation	Motorola Poland
Country	Poland
Area of Action	Mobile industry
Target	Students, employees

Objectives of the initiative / Programme

Motorola Poland has launched two different initiatives with the aim of increasing the number of women among its employees. The first one has the objective of retaining female employees in the company. The second one (Educational Diversity project) aims to increase the number of women attending technical degrees, since the lack of women in technical studies is the main problem for Motorola in recruiting women.

Women's Career development:

In Motorola, gender issues are considered under the diversity section, which aims to embed diversity into business practices. This section is in charge of different Business Councils, among them the Women's Business Council which develops initiatives to enhance women's career development and avoid the "leaky pipeline".

Educational Diversity project:

This project was launched to encourage young people, and girls in particular, to consider pursuing technical studies, showing them the advantages of work in this field. Its objective is to increase the number of women attending computer studies programmes.

Brief history / Background information

The study commissioned by the European Commission in 2006[134] identifying best practices in Europe in the domain of Information Society analysed the case of Motorola Poland. The analysis pointed out the success of the company achieving greater gender equality in a very complex environment with strong cultural stereotypes regarding women and ICT.

The two main initiatives launched by the company are the following:

Women's Career development:

Measures related with women's career development have been implemented for a long time. This is not a fully planned programme for women's careers; it

[134] European Commission (2006): Best practices for even gender distribution in the 25 member states in the domain of Information Society. Brussels

is rather a series of meetings with business leaders, exchanges and discussions about feelings, experiences and information. However, these activities are linked with the Organization Talent Review where every manager declares how many women he or she hired in the organization and what are the plans for their female employees. So this is not only talking, it is a way of following their careers.

Educational Diversity project:

The Diversity Project was launched in 2000 by Global Software Group-Poland. Since its launch until 2006 about 6.000 pupils took part in the project and girls' participation has surpassed 50 per cent. Since 2003, the project is online what has allowed avoiding rejection of some teachers, to reduce costs and to increase its visibility.

Main tools / Methodology

Women's Career development:

Motorola has implemented a great variety of measures for increasing the number of women among its employees and among its highest positions:

1. Job announcements all include that women are particularly invited to apply. Also, recruitment procedures are transparent and do not permit any discrimination.
2. Employees that informed a female friend about an open position, and recruitment managers with high women recruitment numbers receive a bonus.
3. All women on maternity leave receive a promotion when they come back.
4. After maternity leave women can enjoy flexible working hours, specific breaks for breast-feeding and telework.
5. Employees can refuse travelling and working hours are very stable, which allows a good balance between personal and professional life.
6. Interviews and surveys are carried out for all employees in order to know the needs and problems that they face in the work. Some questions of these interviews are specifically adapted to women. Also, when an employee leaves the company there is an "exit interview" and in the case of women there are some questions about equal treatment.
7. There is a service called "Ethic telephone line" that allows employees to complain about harassment cases, bullying or unfair treatment in an anonymous way. Complains can result in an enquiry if considered necessary.

Educational Diversity project:

This project organises among high-school students education projects, provides insight about computer engineering as a profession and shows that Motorola is looking for talent. One example is the contest for the creation of a website that the company launches every 6 months. The website must be

created in six months by teams of 4-6 pupils with a 50% of girls.

Furthermore, Motorola supports women entrepreneurship choosing women-owned businesses as suppliers and participating in the organization of different activities for providing certification, education and networking opportunities to these entrepreneurs.

Monitoring and evaluation system

Motorola has two main tools for monitoring the Women's Career development programme: the Annual Salary Review and the Monthly Operations Reviews.

The Annual Salary Review focuses on the employees' remuneration and contains a special analysis of women's salaries.

The Monthly Operations Reviews analyse the gap between men and women in terms of number of employees, recruitment, promotions, etc.

These documents are for internal use of the company only.

Progress: main achievements

Both programmes have significantly increased their participants since its launch. This increase has been especially relevant in the case of the Educational Diversity Project that has double the number of participants since 2006.

On the other hand, Women's Career Development activities have helped to increase the number of female employees and have also driven them to high positions.

As an example, in Krakow the percentage of female engineering employees in 2006 was 8% and currently it is 11%. The percentage of female managers has increased to 14%.

Progress: Problems identified

Some of the women's career development measures have been reformulated since they were launched.

It has been noticed that female employees do not want to be treated any differently from their male colleagues. Training courses with technical or managerial content targeting exclusively women were not appreciated by female workers, especially in the most technical areas of the company. The strategy was therefore revised for those areas and the measures in place where modified.

Concretely, new informal activities like yoga or dance have been launched to gather together women and create networks. Those activities are also open for men. This has helped reducing women's reluctance to come together and, over time, has facilitated the introduction of other activities more related to career development and professional skills.

Some corrective measures have also been introduced in the educational diversity programme to keep the contents of the programme updated new

interests and its target's maintain interest.

Among new activities, it must be highlighted the organization of meetings with women in high positions to act as a role models and carry out mentoring activities. In these meetings women share experiences about how to balance personal and professional life, how to success within the company, etc.

Furthermore, some new activities for employees' children have been introduced.

Key success factors

This monitoring system has proved very useful for improving the Women's Career development program because it provides very useful information to check the inputs of the actions launched, and also to convince sponsors to finance the events and the activities.

To encourage the creation of women's networks within the company activities not directly related to work content have result more successful than activities centred in the development of professional skills. Initial barriers to participate in such activities have been thinned though the previous creation of informal networks.

Findings and recommendations

For the success of gender policies in an organization is important to avoid measures that could discriminate against male staff since this may result in mistrust.

Implementation of activities that are attractive to women allow them to network in an informal environment.

Case 4. She Will Innovate: Technology Solutions Enriching the Lives of Girls competition

Name / Title	She Will Innovate: Technology Solutions Enriching the Lives of Girls competition
Organisation	Ashoka ChangeMakers & Intel Corporation
Country	Worldwide
Area of Action	Entrepreneurship
Target	The competition is open to solutions from around the world, with special consideration to innovations developed for women by women aged 18 to 34.

Objectives of the initiative / Programme

Intel Corporation and Ashoka Changemakers launched this online competition to find the world's most innovative solutions that equip girls and women with new digital technologies—enabling them to live healthier, smarter, and more meaningful lives.

Brief history / Background information

Intel Foundation supports research and competitions in the field of technology and gender because they are concerned about the technological gap between men and women regarding access to technology. Intel Foundation's objective is to show that technology enables access to education, information and jobs.

For this reason, Intel decided to collaborate with Ashoka Changemakers, a community of action that connects social entrepreneurs around the globe to share ideas, inspire, and mentor each other.

As part of this partnership between Intel and Ashoka the programme "She Will Innovate" was launched. This initiative joins Intel's expertise and desire to improve girls and women's lives through ICT and Ashoka's expertise in sourcing "changemakers" across all fields.

Main tools / Methodology

Within "She Will Innovate" the main element of the partnership Intel-Changemakers is a competition launched in 2012. This initiative rewards ICT innovations targeting women but developed either by women or by men, because including men is considered very important since they must become part of the solution. The solutions proposed must be innovating, must have social impact and must be sustainable.

The first winners have just been announced and have each received a prize of $10,000. In addition, Intel will provide technical support to the winners in order to scale up their solutions.

There are also other benefits for being part of the community: networking opportunities and more visibility for the project that makes obtaining funding easier.

On their side, Changemakers and Intel obtain information about global trends in the sector, people's demands, etc.

Main achievements

The initiative has been a big success: the competition has received close to 300 proposals from 56 countries around the world. Furthermore, the media campaign they have developed has reached over 4,000,000 people, which has contributed to raising awareness on the digital divide.

Key success factors

Changemakers invests in people with innovative ideas with great impact. One of the key success factors of the initiative is the dissemination of the idea that everybody has the power to change things.

Findings and recommendations

Setting up a partnership between technological companies and organisations specialised in developing programmes for raising awareness can establish good synergies between the two, and increase the impact of measures.

Involving men in the actions to empower women through technology helps to increase male awareness of the problem.

Scaling up these initiatives, which encourage girls to join the ICT sector and also foster entrepreneurship.

Case 5. Centrum Wiskunde & Informatica (CWI)

Name / Title	Gender Measures at CWI
Organisation	Centrum Wiskunde & Informatica (CWI)
Country	The Netherlands
Area of Action	Research
Target	Researchers of CWI

Objectives of the initiative / Programme

The aim of CWI is to increase the number of female researchers and enhance their professional development and reduce the leaky pipeline.

Brief history / Background information

According to the 2012 annual report of CWI women represent 19% of all researchers. In 2010 the percentage was 18%.

CWI is an NWO institute (The Netherlands Organisation for Scientific Research, NWO), which is very aware of gender issues and has among its objectives to increase the number of women among Dutch scientists.

As an NWO institute, CWI implements the guidelines of NWO regarding gender, both policies and monitoring activities.

Main tools / Methodology

Currently, CWI's vacancies for tenure track and permanent positions are open to everybody and transparent competition among researchers is encouraged.

However, the participation of women is still low and CWI is considering the implementation of additional measures, such as the creation of positions open only to women.

This measure has been implemented in other Dutch institutions, such as the Universities of Amsterdam, Delft and Groningen, with success. However, there has been certain controversy in the Netherlands with this measure, which has been claimed to be discriminatory, and the measure is still being analysed.

CWI also collaborates closely with Informatics Europe[135] in the **"Women in ICT Research and Education" working group**, aiming at providing information to heads of departments of universities and research centres that will help them to increase the participation of women. Their actions include the realisation of a survey and the elaboration of recommendations based on

[135] http://www.informatics-europe.org/

the survey. The survey was launched in March 2013 and results are being analysed. However, response rate was very low (around 15%)[136].
Findings and recommendations
Implementation of open promotion procedures is useful when there is a high awareness of the importance of having a diverse workforce among people in charge of the selection. If this awareness does not exist, the procedure can be easily influenced and the tradition of the institutions acts in favour of men.
Awareness has proven to be a useful tool to boost the implementation of measures to increase the number of women among scientists. When institutions are encouraged to report their numbers on gender issues they tend to notice gender gaps and take action.
A measure proven to work at other institutes to increase the number of women among scientific staff is the implementation of positions exclusively for women. Despite these policies being criticised as discriminatory, they have shown to be successful to increase the proportion of women, especially in traditional institutions.
For certain positions, and particularly in very traditional and male-dominated institutions, women need to be specifically addressed and encouraged to apply. For this reason, although quotas and exclusive positions for women have to be implemented carefully and in accordance with existing regulations, these measures seem to be effective to increase female participation.

[136] The questionnaire of the survey can be found here: http://homepages.cwi.nl/~lynda/IE-WIRE/IE-Women_in_Informatics_Research_and_Education_Survey_Jan13.pdf

Case 6. Simula Gender Action Plan 2010-2015

Name / Title	Gender Action Plan 2010-2015
Organisation	Simula
Country	Norway
Area of Action	Recruitment and working environment
Target	Employees

Objectives of the initiative / Programme

The goal of Simula's Gender Action Plan 2010-2015 is to increase the percentage of women amongst their employees. The target is to have at least 25% of female employees within the categories of scientific and support staff by December 2015.

Brief history / Background information

The Gender Action Plan is the materialization of Simula's commitment to gender equality. Since Simula is a public entity, this commitment responses to the objective of the Norwegian Government of increasing the number of women in STEM in all levels.

The Plan was established in 2009 by the Board of Directors.

Main tools / Methodology

To achieve its goal, Simula has defined a list of measures addressing the areas of recruitment and working environment.

Measures include some non-gender specific actions, which are however expected to have great impact in helping to attract and retain female scientists.

The management is responsible for the implementation of the Gender Action Plan. It is foreseen that, by the end of the period 2010-2015, the administration evaluates, reviews, and makes a new five-year action plan based on this previous experience.

Furthermore, they have defined a system for producing statistical reports to make the process transparent: the administration shall provide yearly salary reports categorized by gender and position to ensure there are no Gender Payment Gaps.

The monitoring process includes the presentation of an annual report showing the progress in the implementation of the Plan and its results.

Specific measures:

1. Recruitment and hiring

- Highly qualified women should be headhunted directly for research positions.

- In general, all units recruiting should search for qualified female candidates and encourage them to apply for available research positions. When a woman has the same qualifications as a man, the woman should be given priority on the short list.

2. Working environment improvements

- Managers are trained on the importance of recruiting women and creating a working environment that promotes awareness about gender issues.
- Establish a mentoring programme for general advice and support for PhD students, postdoctoral fellows and researchers. A relevant number of mentors in the programme are female.
- Ensure that both genders are represented in boards and committees, and when external assessments are conducted.
- Provide flexible working conditions and family-friendly benefits to support the combination of professional development and family responsibility.
- Arrange an annual seminar series aimed at helping researchers learn the necessary crafts and skills needed to become successful in academia or industry. Such seminars may include topics such as securing funding, project management, career planning, networking, etc. To ensure gender equality among senior researchers, project leaders and managers have to encourage participation in such seminars regardless of gender.
- Engage in discussions with other high-profile research institutions regarding measures designed to reach gender equality, and regarding the assessment of such measures.

3. Encouraging girls to choose ICT

- Simula provides a quiet space during examination time at the local secondary schools, where students can sit and study. PhD and masters students at Simula can also help them to revise and answer question in physics and mathematics.
- Attendance of careers fairs held at the University of Oslo as well as in other cities.
- Attendance at career days for secondary school students who are trying make the choice of which higher degrees to pursue.
- Organize a day at Simula called “Women, science, and leadership”. At this event the girls were introduced to other women working at Simula who gave presentations about the kind of research that they pursue. The girls were also encouraged to join the field of mathematics and natural sciences and informed about the types of careers they can pursue in this field.

These actions are spread through social media because Simula thinks that is an important tool to connect with young people. For this reason, they are

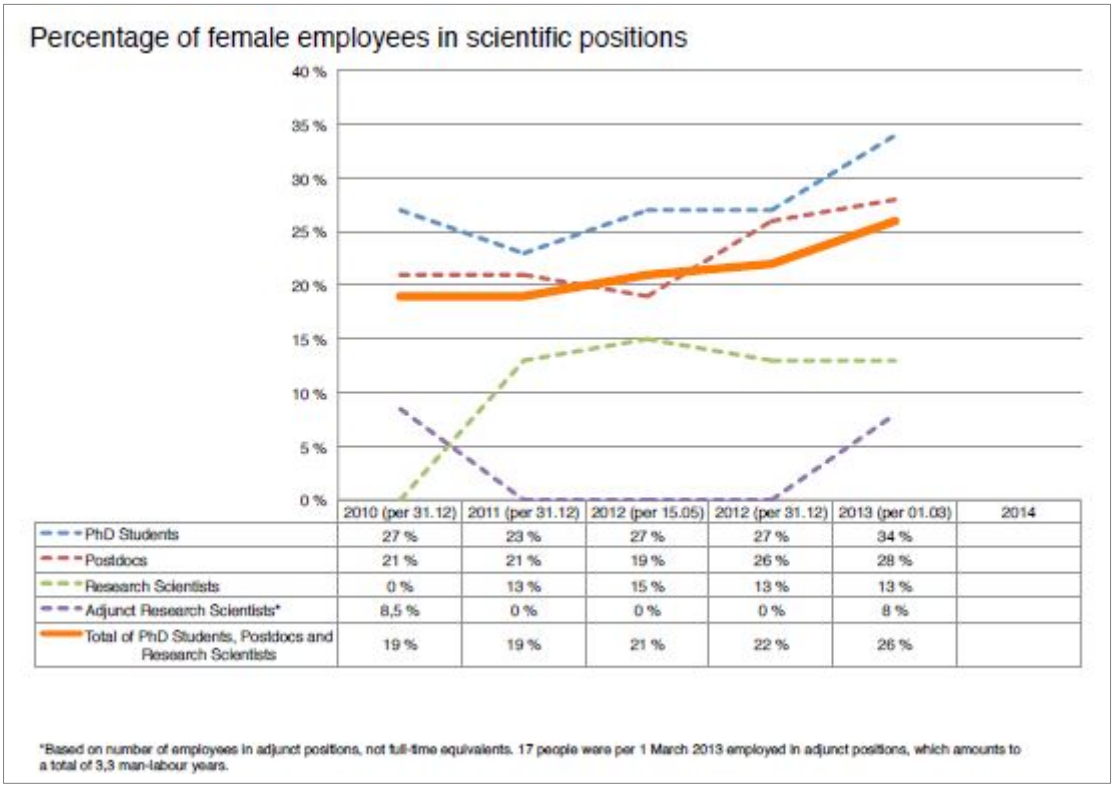
working harder to increase their impact in them in order to get more public interested in these activities.

Main achievements

Today, females account for 26% of scientific staff. When the Gender Action Plan was adopted in 2009, the figure was 19%.

Therefore, the goal established for the year 2015 has already been achieved.

Image 1. Percentage of female employees in scientific positions in Simula



	2010 (per 31.12)	2011 (per 31.12)	2012 (per 15.05)	2012 (per 31.12)	2013 (per 01.03)	2014
PhD Students	27 %	23 %	27 %	27 %	34 %	
Postdocs	21 %	21 %	19 %	26 %	28 %	
Research Scientists	0 %	13 %	15 %	13 %	13 %	
Adjunct Research Scientists*	8,5 %	0 %	0 %	0 %	8 %	
Total of PhD Students, Postdocs and Research Scientists	19 %	19 %	21 %	22 %	26 %	

*Based on number of employees in adjunct positions, not full-time equivalents. 17 people were per 1 March 2013 employed in adjunct positions, which amounts to a total of 3,3 man-labour years.

Source: Simula's Gender Equality Report (2009)

Key success factors

Two are the main key success factors in this case study:

1. **High-level commitment to the objective**

   In the first place the commitment of the Norwegian Government to gender equality has been essential for the elaboration of the Plan, and its goals are a duty for public entities.

   Secondly, the Plan has been adopted at the highest level of the organization (Board of Directors) and has been assumed by the managerial staff as an important objective. This level of commitment has been vital to overcome resistance to change among employees.

2. **The recruiting policy:**

   Despite the low number of female candidates due to the low number of women graduates in STEM studies, they have made an effort to seek

talented women. Furthermore they have proved that women attract other women, which has helped to increase their number among their workforce. An active search of candidates has had a great impact on the success of the Plan.
Findings and recommendations
Government support and active implication in promoting change is essential to achieve gender equality
A high-level commitment among the managing directors of the organization is the key factor for success. Actions must involve all spheres of the organization.
It is necessary to establish a transparent monitoring and evaluation system, including periodical reporting (public or at least available to all employees).
The creation of specific measures for recruiting female talent, such as including quotas for short lists and enhancing active search for female candidates, has proven to be very effective.
The implementation of measures to increase the interaction of research staff (or workers) and students by facilitating co-working spaces or organizing special visits or events increases awareness and helps to attract girls.

ANNEX V. ANALYSIS OF SOCIAL MEDIA CAMPAIGNS

Methodology

An examination of the reactions to certain social media campaigns is conducted in order to reveal the elements common to successful media campaigns.

The purpose is not only to identify which programmes are successful, but also why they are successful. This entails an investigation of both the social and professional responses and criticisms of these campaigns, combined with any measurable impacts such as: Youtube views, Twitter mentions and "Re-Tweets", etc. This is done in the hope of replicating these factors in subsequent campaigns, and to better understand the nature of key success factors in social media.

A wide variety of campaigns are examined from both the public and private sectors. The issues range from public service announcements to brand enhancement and rebuilding, to philanthropic and social initiatives. A total of 4 campaigns, 1 from the public sector, 1 from the non-profit sector, 1 from the ICT sector and 1 from the non-ICT sector, are selected for a deeper analysis.

These cases are selected as model or "exemplary" campaigns which truly harness the spirit, purpose and power of social media and provide elements which can be used to help to advertise to, and entice women to enter into ICT fields. The selected cases include:

- "Dumb Ways to Die" from the Melbourne Metro.
- Code.org.
- "Little Amazing Show" from Nokia.
- KLM.

Case 1: Melbourne Metro, "Dumb Ways to Die"

Name / Title	Dumb Ways to Die
Organisation	Melbourne Metro Rail
Country	Australia
Area of Action	Public safety
Target	Australia's Citizens

Objectives of the initiative / Programme

- Produce an awareness campaign encouraging citizens to act more safely.
- Reduce casualties around the train areas.
- Create a buzz and go viral.

Brief history / Background information

According to Melbourne Metro the risky behaviour of users around trains has been increasing accident rates over recent years. Generally speaking, safety messages are not very attractive to users and, in Melbourne Metro's own words, "*traditional public safety messages just do not work on young people: tell them to do one thing, and they'll do the opposite*"[137].

For that reason the Metro has decided to launch a campaign which could be attractive to young people, so as to get across the message that safety around trains is a very important issue.

The video "Dumb ways to die" was uploaded on November 14th 2012.

Tools / Methodology

The campaign contains a 3 minute video with a "catchy" song designed to go viral around the world of social media. During the video a number of characters (animations) die in easily preventable ways (i.e. setting fire to one's hair). The video concludes with how certain behaviour around trains can also be dangerous.

The campaigned uses a variety of channels, including Youtube[138] and a microsite[139], specially created for the campaign. Furthermore, one could download the video for free from Soundcloud, purchase it on iTunes or get the animated GIFS for free on the Tumblr site.

[137] http://www.google.com/think/campaigns/dumb-ways-to-die.html

[138] https://www.youtube.com/watch?v=IJNR2EpS0jw

[139] http://dumbwaystodie.com

Image 2. Dumb ways to die video on Youtube

Source: www.youtube.com

Main achievements

1. *Media achievements*: Within the first two weeks the video received around 20,000,000 views on YouTube, and two weeks later it was the 6th most shared video of all time. In addition, the song made the top 10 on the iTunes charts in several countries, and was downloaded via Soundcloud hundreds of thousands of times. At the moment it has reached over 50 million visits[140] on YouTube and now there are nearly 100 cover versions of the video on this social site.
2. *Impact achievements*: Schools worldwide have adopted this campaign material with the purpose of teaching good behaviour. In addition, early results show a 20% reduction in accidents on the Melbourne Metro thanks to this campaign.

Key success factors

The campaign has achieved great success, not only in Australia, but all around the world.

- The video itself is simple and enjoyable, with a very catchy song. All elements of the video are attractive: the characters, the song, and the funny situations described.

[140] Source: Youtube, accessed on 12/06/2013

- It does not show who the target is and avoids stereotypes, thus meaning that anyone (and everybody) can be self-represented in the video. - The video has no enforcement character, and does not tell people what to do. - It is very easy to access (mobile) and to share, hence it is accessible through most important social media tools, but with the right type of content for each of them (video, song, animated GIFS, etc.). - It has a strong viral effect.
Replicable recommendations
Campaigns with a persuasive and emotional orientation have greater effects than rational ones, particularly among young audiences.
Educative and enforcement campaigns are associated with less effective campaigns, especially among young audiences.
To obtain a viral effect YouTube is the most useful channel (social media).
Content which avoids stereotypes and present ideas in a neutral way is less likely to be criticised.

Case 2: Code.org

Name / Title	Code.org platform
Organisation	Code.org
Country	USA
Area of action	Education/ Public awareness
Target	Potential students of software

Objectives of the initiative / Programme

- Promote computer science education.
- It is much easier to learn to program than generally thought.
- Build an authoritative database of all programming schools.

Brief history / Background information

Code.org is a non-profit organisation dedicated to increasing the education of programming in the USA. According to the organisation, there is a great demand for programmers and it is estimated that by 2020 there will be 1,400,000 computer-related jobs compared to only 400,000 students, with demand growing at a rate twice that of other fields. However, 90% of the schools do not offer programming classes.

Therefore, computer science and computer programming should be part of the core curriculum in education, alongside other science, technology, engineering, and mathematics (STEM) courses.

Tools / Methodology

The organisation has created a website (www.code.org) which provides arguments in favour of their objectives and resources for students and teachers to learn/teach how to code, whilst also providing parents with tools to take their kids to learn.

As their main dissemination tool they have created a video which collects testimonies of leading personalities of the ICT and non-ICT world. These include the philanthropist and founder of Microsoft, Bill Gates as well as Facebook founder Mark Zuckerberg, who encourage students to learn computer programming at school or free online.

There are three versions of the video with various lengths to facilitate its consumption and distribution.

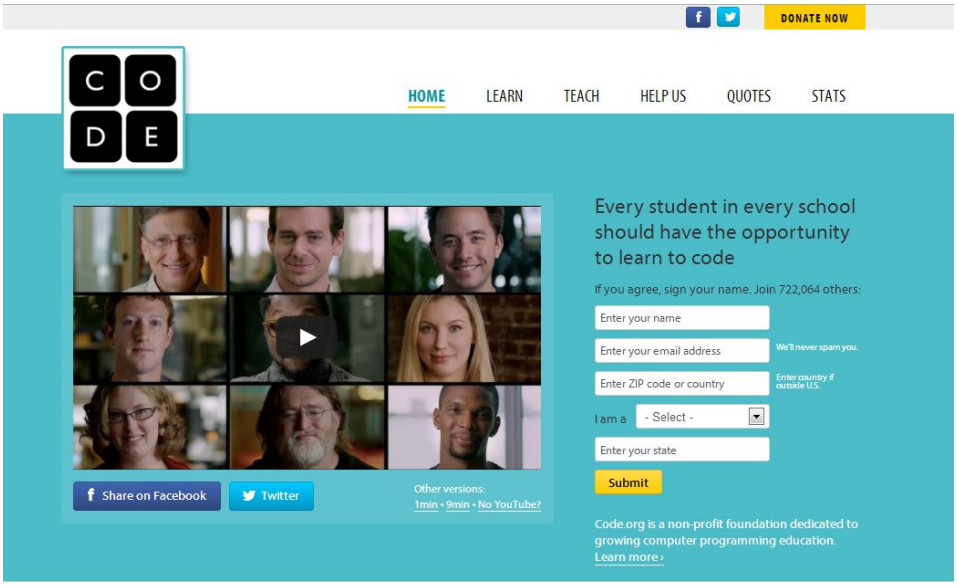
Main achievements

1. *Media achievements*: The video received 5 million views in two days,

and was one of the most popular videos on YouTube.

2. *Impact achievements*: The video itself will be available to over 500,000 classrooms, thanks to a deal the team is working on[141]. A petition on the Code.org website to include coding in schools programmes has been signed by around 700,000 people.

Image 3. Code.org homepage



Source: Code.org

Key success factors

The initiative is based to a great extent on the power of role models. Code.org has brought together some of the biggest starts of the technology industry as well as stars from other areas (i.e. NBA, music, politics) to propagate their message, through quotes on their website or by appearing in the video.

The key success factor of the campaign is therefore the participation of relevant figures that are considered as role models by the US population.

In addition:

- The three different duration types of the video (1, 3 and 9 min) appeal to different audiences who have varying degrees of interest in the topic.
- The website provides many useful tools, such as a database of schools which teach people to program, or websites where you can also learn for free.
- It has a great slogan of: "Every student in every school should have the opportunity to learn to code".
- The website offers the possibility to sign a petition, which might help the organisation to put pressure on public authorities.

[141]Source: Olanoff, D. (2013): *Code.org launches to help make computer programming accessible to everyone.* http://techcrunch.com/2013/01/22/code-org-launches-to-help-make-computer-programming-accessible-to-everyone/

Replicable recommendations
The objective of the organisation is supported by objective arguments (number of students vs. number of jobs in the sector).
The use of famous people (role models) who are known and admired gives credibility to the message and has made the video popular.
The use of different versions of a video is a useful way in which to penetrate different target audiences, depending on their willingness to watch the video.
Websites have better impacts when they include useful resources and tools rather than only providing information.

Case 3: Nokia

Name / Title	"Little Amazing Show"
Organisation	Nokia
Country	Germany, India, Spain, UK and France
Area of action	Marketing
Target	Potential buyers of mobile phones (younger generations)

Objectives of the initiative / Programme

- Build awareness.
- Influence young consumers.
- Generate a buzz and create a viral effect.

Brief history / Background information

In November 2011 Nokia launched a social media campaign called "Little Amazing Show" to support the launch of the Nokia Lumia phone, as part of the bigger marketing campaign tagline "The Amazing Everyday".

Image 4. Action in London

Source: http://printmediacentr.com

The campaign was based on the dissemination through social media of short videos showing small actions which can make a normal day into something special. In addition to these small actions, on the 28th November 2011, a big

event was organised in London, and involved the transformation of a building into different 4D optical effects, a series of giant eyes to hundreds of Tetris-like pieces, all livened up by DJ deadma5.

Tools / Methodology

"Little Amazing Show" is a BTL (Below the Line) type of marketing campaign which used Facebook and YouTube as its primary dissemination tools.

Six episodes were recorded between November and December 2011 under the slogan "Little ideas to make everyday more amazing". Episodes include:

1. Berlin
2. London
3. Madrid
4. Night
5. Paris
6. Mumbai

All episodes, except for Episode 4 (Night), consist of small actions done in public spaces in the mentioned cities which are filmed, edited and published through the social media. For example, the action in Berlin consisted of leaving a piano in the middle of a square so people passing around could play it, and a gift box from which people could take things or into which they could put things[142].

Image 5. Action in Berlin

Source: www.wp7connect.com

The short film in Mumbai (India) consisted of a flash mob in a mall, and showed citizens closing their establishments for the sole purpose of dancing.

Episode 4 was the biggest event of the campaign and consisted of a night

[142] https://www.youtube.com/watch?v=uhw6bsy0PDY

event in the streets of London, which could be followed live on Nokia's Facebook page. A mapping technique allowed for the projection of bespoke graphics directly onto a building (800 windows were covered with vinyl), creating witty and dramatic illusions. A famous DJ also participated.

Main achievements

1. *Media achievements*: Nokia released statistics revealing that its number of Facebook fans had increased by 13% since the campaign. There were more than 5 million viewings of the lightshow event on YouTube and more than 2 million social impressions in Twitter.
2. *Business achievements*: More than 5 million Nokia Lumia sold in 1Q 2013 in comparison to 4.4 million units sold in the last 3 months[143]. This is an increase of more than 25% of the units in comparison with a decrease of 20% of net sales of the overall Nokia phones.

Key success factors

Nokia is a brand which has been typically favoured by older, more conservative consumers[144], and with this campaign it is attempting to speak the language of younger generations (future buyers). In this sense, the main success factors of the camping are:

- It was specifically designed for social media.
- It used the right language: based on visual elements, short and easy to see on any type of device, particularly smart phones.
- It had the right messages: it sent the message to enjoy life, be happy, smile, etc. Videos were intended to make people think like children, that is, see how simple life is and leave everyday problems behind for a while[145].
- It had a participatory approach: actions were simple, accessible and fun, which made people get involved.
- The "Night" event was designed for a young audience: it consisted of a mix of popular DJs and a spectacular free show.
- It had a mix of costly and cheap events and used different locations to facilitate a global dissemination.

Replicable recommendations

A campaign disposed to attract younger generations' needs to create videos/campaigns where these targets feel reflected and are willing to participate.

[143] Source : Interneonomia (2012) : *Lumia, incapaz de salvar a Nokia.* http://www.intereconomia.com/noticias-negocios/claves/lumia-incapaz-salvar-nokia-20130422

[144] Source: Costa, M. (2011): *New growth at Nokia.* http://www.marketingweek.co.uk/new-growth-at-nokia/3031928.article

[145] Source: Hernandez, S. (2012): *"The Amazing Everyday" de Nokia.* http://www.clicker360.com/blog/2012/01/the-amazing-everyday-de-nokia/

The mix of little events/videos with one “big event” which assembles everything together helps to create synergies and may help to reduce costs of long and/or ambitious campaigns.
Organising unexpected actions in different locations helps to create expectation about upcoming activities and makes dissemination easier in the various countries. A single event in one country hardly generates expectation in other countries.

Case 4: KLM

Name / Title	Surprise, Surprise
Organisation	KLM Airlines
Country	Netherlands
Area of action	Customer satisfaction/ Branding
Target	KLM clients

Objectives of the initiative / Programme

- Increase brand recognition, reputation.
- Demonstrate social media abilities.
- Increase social media presence.
- Create buzz and go viral.

Brief history / Background information

During the eruption of a volcano in Iceland in 2010, KLM customers encountered clogged customer service hotlines. Instead, they shifted to social media to communicate with the company and navigate the sea of cancelled flights in Europe. This was so effective that the company then decided to increase their involvement in social media. In 2010 the Dutch Airline randomly selected 40 of their customers who had announced that they were flying KLM on Twitter and Foursquare. They researched these customers and gave them a personalised gift immediately before boarding their flights.

Tools / Methodology

There are three factors which are integral to KLM's decision to try this campaign. KLM advertising places a heavy focus on customer service, and they realised after the Volcano that social media is an easy way to connect directly with the customer. The third factor is the intrinsic viral aspect of social media.

A small team of flight attendants at Schiphol Airport in Amsterdam researched travellers and selected personalised gifts for them. For example, one girl posted that she was flying KLM to Rome to go hiking, so the attendants bought her a pedometer (Nike liveband). They found that another flyer used his iPad to check in on Foursquare, and so they gave him a $15 gift card for the iTunes appstore.

Main achievements

1. *Media achievements*: KLM reports that they had 17,528 Foursquare Followers, more than 150,000 YouTube views, and more than 1.5 million Twitter followers.

2. *Impact achievements*: This campaign served two purposes, as it was both a kick starter and a "test run". KLM followed up the success of this programme with numerous other social media programmes, and they even repeated it in the summer of 2011.

Key success factors

KLM used social media to learn about their customers, and show that they appreciated their business by giving them personalised gifts.

- Passengers at an airport have plenty of idle time to post content. After they received their gifts, they could immediately talk about it on social media, thus spreading the word.
- Follow up campaigns on YouTube, Facebook, and Twitter helped promote by allowing followers to share videos.
- Rewarding customers for doing something the company wants, which in this case was flying with KLM.
- Due to the small scale it had a large impact because of the viral aspect.
- It also has a low financial risk.

Image 6.KLM Action

Source: www.tourism-review.com

Replicable recommendations

The best part about this campaign is that it was not a "one off". KLM has several other gimmicks which increase engagement.

Companies which act small, thoughtful, and seem personal to customers can benefit from Social Media. KLM seems like they care about their customers.

A Microsite on Facebook which reports successful and failed Social Media campaigns makes their overall campaign feel genuine and human. The use of multiple channels of Social Media promotion is crucial in order to be truly effective.

General conclusions

The most remarkable aspect of social media is its ability to “go viral”. This is when something on the Internet, such as a video, Facebook, or Twitter post can spread with such speed that it becomes a global sensation in a matter of hours. This reveals the most crucial element of a social media campaign, namely the ease of which it can be shared.

For example, most of the campaigns we examine have YouTube videos of less than 5 minutes in length. This allows them to be concise, but still effective in addressing their objectives. This in turn increases their number of views, and the likelihood that the video is shared.

A subsequent element is the content of these videos. The cases featured contain videos which use positive emotional appeals such as humour and empowerment. The “Dumb Ways to Die” video repackages a sad subject such as death into something which is light-hearted and engaging. Other campaigns such as the Nokia “Little Amazing Show” and KLM’s “Surprise, Surprise” focus on companies which are giving back to their consumers. The Code.org combines celebrity endorsements and empowerment to capture the attention of viewers. This campaign is successful in sending a message that programming is accessible, and not for a select group.

A third common success factor is how deep into the social media world these campaigns are able to get. These campaigns have a presence in multiple social media networks, rather than relying on one channel. This allows users to cross promote using various mediums, thereby deepening the market penetration. These campaigns also utilise a multifaceted approach regarding the structure of the campaign. In the case of Nokia, they utilise small-scale events to stir awareness for a larger media event. The Code.org campaign was established alongside classroom initiatives to increase awareness. As with any media campaign, social media campaigns are most effective when they are supported by organisational initiatives, which is done to capitalise on the increased awareness, and which in turn increases engagement.

Recommendations are to implement a media campaign featuring prominent females in the fields of ICT, Engineering, and Mathematics to serve as role models. This should be supplemented with educational and social programmes which aim to increase the awareness of the positive aspects of pursuing degrees in this field, while simultaneously attempting to break down gender stereotypes through the empowerment of women.

ANNEX VI. CAREER PATHS

A total of 9 ICT career paths have been elaborated on based on the interviews conducted with relevant women in the sector to show the possibilities that the sector has to offer to women. The aim is to illustrate the evolution of each path as well as the educational and professional background needed to get to those positions. Some quotes from the interviews have been inserted in order to make the paths more visual.

ICT COMPANY MANAGER

Overview

Personal profile: A woman with strong technical and managerial capabilities as well as a deep understanding of the role of ICT in organisations.

Professional profile: also known as CIO (Chief Information Officer), the IT manager is responsible for ensuring that the organisation has all of the IT infrastructure and services necessary for the organisation's operations.

Job description

A CIO, sometimes referred to as the IT Director, is an executive who belongs to the senior management of a company, and is responsible for overseeing, managing and coordinating all IT aspects of the company or organisation.

Responsibilities

- Oversee the development of the IT department of a company.
- Develop, execute, and manage computing and information technology strategies.
- Ensure that the best IT tools, software, equipment, and telecommunication devices are being used to promote business excellence.
- Hire, develop and supervise the department's staff.
- Define and manage the department's budget.
- Report to the Chief Executive Officer (CEO) of the company.

Profile

Individuals usually possess a bachelor's degree, although a master's degree in IT or computer science is beneficial. Hence, CIOs can have jobs with degrees in fields such as business operations, consulting or accounting/finance.

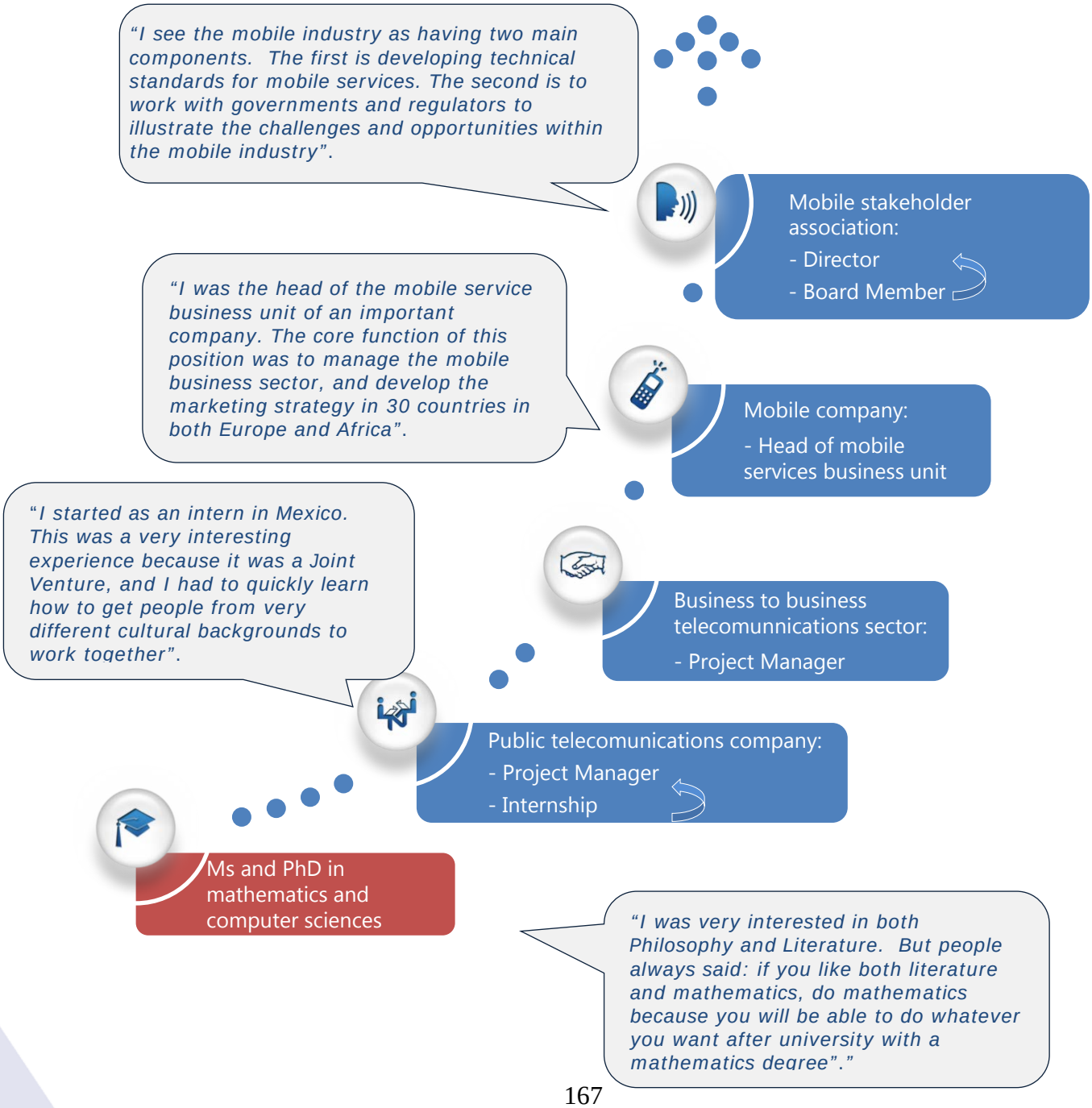
Skills required

- Strong written, verbal and interpersonal skills.
- Ability to manage multiple projects and priorities.
- Effective decision-making.
- Mentoring and team-building.
- Business/negotiation skills (strategic awareness).
- Strong understanding of IT software and systems, web standards, Internet protocols, RFC Standards, Revision Control Systems as well as Database Management Systems, Internet Marketing and search engine optimisation.
- Exposure to business theories, business process development, governance processes, management, budgeting and administrative operations.

Career path

"There are people who sometimes overestimate the complexity and the difficulty of studying science or mathematics. Also there is an image, which I think it is completely cultural, that this is not for girls or for women. In my experience it was never been the case, there is nothing either female or male about mathematics. It is just about what are you comfortable with: abstraction, theories, numbers.

I encourage whenever I can girls to study science and mathematics. I think it is related with the lack of role models or a lack of understating about what it is really".



ICT POLICYMAKER

Overview

Personal profile: A women with a strong character and a deep understanding of the ICT sector and its regulatory and political components, who is willing to influence the course of events.

Professional profile: ICT policy makers are individuals with the authority to set the policies and practices in the area of ICT of governments, public administrations or international organisations. These positions usually involve responsibilities in the areas of regulation, planning, strategic design, strategic management, supervision, and evaluation.

Job description

This is a person involved in a policymaking or regulatory process in the ICT sector. It includes positions in international, national, regional or local governments, as well as public regulators or agencies. Policymakers have strong influence over the sector, and are therefore in positions with high levels of accountability and responsibility.

Responsibilities

- Authorisation of Telecommunication/ICT Services.
- Definition and implementation of international/national/regional IT strategies.
- Competition and Price Regulation.
- Implementation of universal service/access mechanisms to ensure diffusion of information. Radio Spectrum Management.
- Legal and Institutional Framework.
- New technologies regulation.

Profile

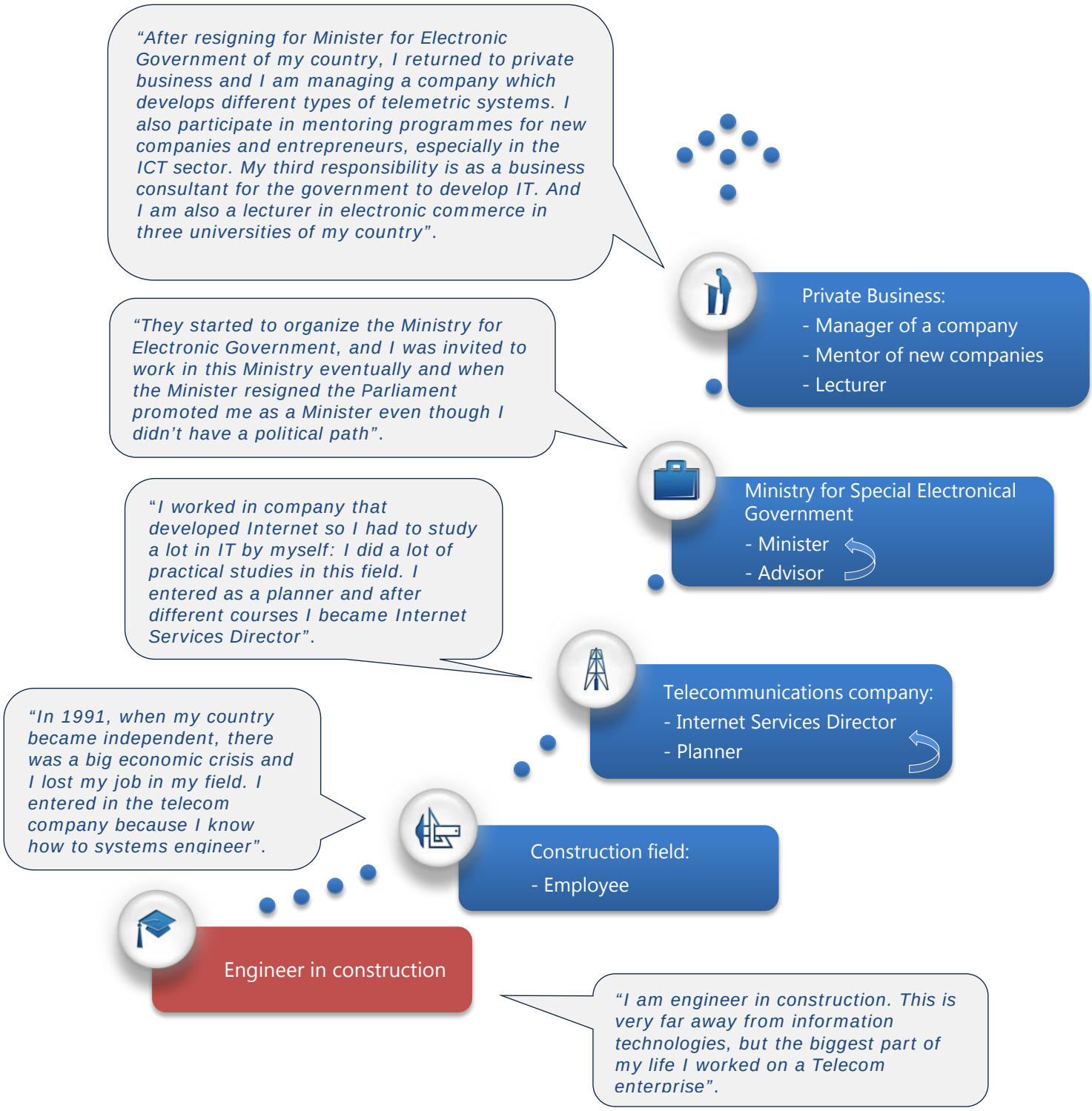
There is not one specific path to becoming an ICT policymaker, although typically there are strong political motivations. Most enter the field as politicians. This means that a bachelor's degree is generally the minimum requirement, though advanced degrees will give a person a distinct advantage. The most important requirement is having a deep understanding of the ICT sector, which comes from having had successful professional or academic careers. Understanding of the legislative and political environment is a must.

Skills required

- Organisational skills, strategic thinking, strong communication skills and political abilities, problem solving capacities, team player.
- Deep understanding of the political and regulatory context and deep knowledge of the ICT sector.

Career path

"(…) Some of my female friends who are in the sector have no academic training in IT: they are lawyers, economists. But they have joined the sector, maybe because it is developing very fast and it is a challenging, interesting and international environment".



ICT CONSULTANT

Overview

Personal profile: A woman with strong business and technical skills who helps clients utilise ICT to meet their strategic goals.

Professional profile: ICT Consultants must be client-orientated and have strong communication abilities. Since their aim is to improve the efficiency of an organisation's IT systems, this position requires both project management skills and a solid business background.

Job description

An ICT consultant is an experienced individual who advises clients on how to implement information technologies to meet their business objectives. In addition to providing advice, IT consultants often create, implement, and administer IT systems.

Responsibilities

- Provide technical expertise in identifying, evaluating and assisting the implementation of IT processes and technologies.
- Planning of IT development. Coordinate post-implementation and enhance support services.
- Provide regular feedback/reports to Business Units, stakeholders, etc.
- Carry out related projects and duties as assigned.
- Analyse and co-ordinate data. Prepare, write, and present proposals per the Project Management Methodology.
- Ensure that programmes meet or exceed specifications.

Profile

Positions normally require a post-secondary degree in business, computer science, or another related field. However, a suitable combination of both education and experience can also differentiate candidates. Professional training is particularly relevant (certificates from Microsoft, CISCO, Oracle, etc.). Technical education is not always required and professionals with no technical backgrounds often enter the industry after obtaining specific training and certificates (SAP, CMMI, etc).

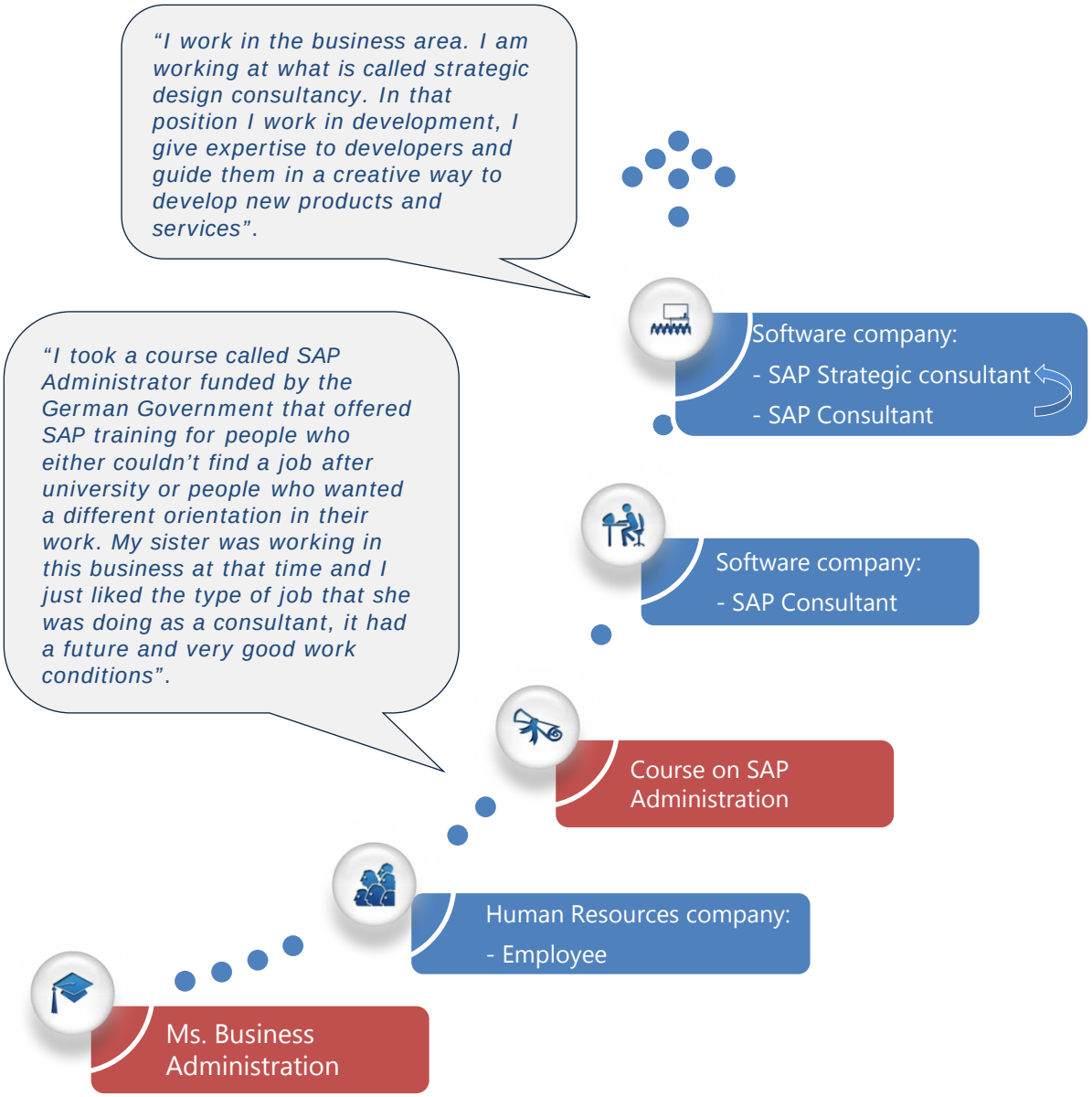
Requirements (skills)

- Technical and problem-solving skills, logical and analytical skills.
- Ability to undertake complex ICT projects.
- Ability to work under pressure, communication skills.
- Business understanding.
- Interpersonal skills and clear client orientation.

Career path

"It is a great option if you feel that you need a different challenge and you want to learn something new. I also think working with technology is really amazing: it allows making things work and become reality. You have always to be up-to-date in technology.

And we have actually very good working conditions and the financial situation of work can be really good, it's well paid".



SOFTWARE DEVELOPER

Overview

Personal profile: a creative woman with strong problem solving, analytical, and programming skills.

Professional profile: software developers create programmes designed to solve problems, improve the efficiency or effectiveness of a process, or simply to entertain.

Job description

Software developers create, test and evaluate software systems used for everything from computer operations to workplace productivity to entertainment.

Responsibilities

- Software design and development.
- Actual core implementation (e.g. installation, configuration, customisation, integration, data migration).
- Participate in software product definition, including business case or gap analysis.
- System requirements analysis.
- Development and refinement of throw-away simulations or prototypes.
- Work closely with analysts, designers and staff to increase effectiveness.
- Prepare training manuals for users.

Profile

A bachelor's degree in a computer-related field is often a requirement for software developer positions, although practical experience may be sufficient to get an entry-level job. Professional training in one or various programming codes is a plus.

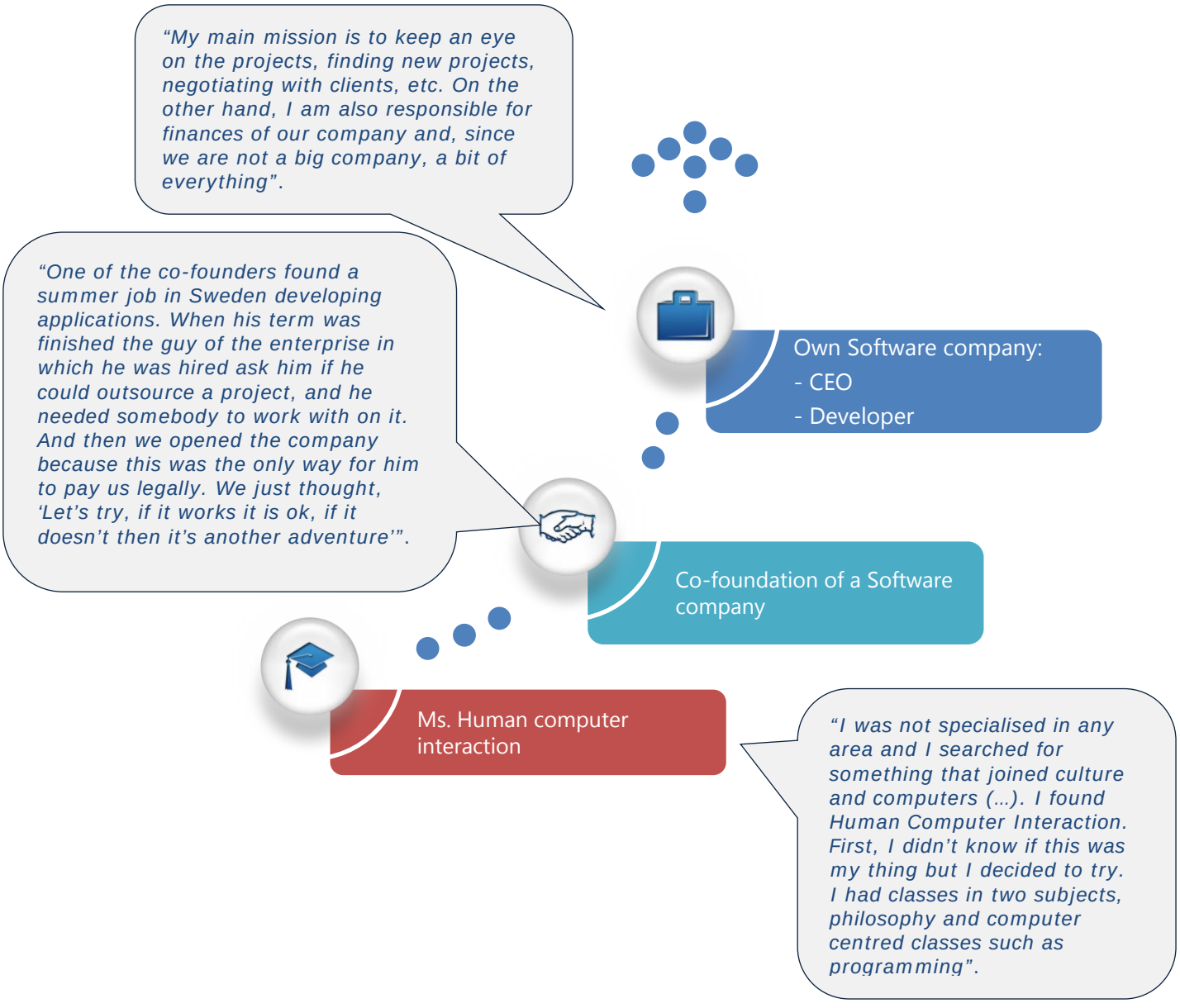
Requirements (skills)

- Experience with software codes (Java, HTML 5, Python, Visual basic, Ruby on Rails, etc.) and expertise in existing computer hardware.
- Good understanding of relational databases (MySQL, MSSQL).
- Curiosity, creativity and problem-solving aptitudes.
- Innovative, flexible and self-motivated.
- Communications skills, team-working skills, organisational skills.

Career path

"I think you need the abilities you need in all kind of jobs. When we are recruiting soft skills are also important for us. It is highly recommended to write correctly in English; because all our communication with clients is in English and we also need that our developers write nice fluent communicating emails. So it's not only about the educational background.

Some of our best developers are not educated in computer science. One of them is a political scientist and there are others that are something similar but technology is their passion. They are just computer fans".



TECHNICAL SUPPORT

Overview

Personal profile: a woman with strong technical and managerial skills who is willing to help customers with their day to day IT issues.

Professional profile: technical support professionals must combine technical skills with communication and managerial abilities, since their objective is to help clients solve breakdowns and faults in their IT systems which are typically crucial for their business to operate.

Job description

Technical support provides information, advice and support to a variety of clients, both professional and amateur. The work relies on a deep understanding of how IT systems work and requires a vast amount of technical knowledge related to networks, hardware, and software.

Responsibilities

- Provide troubleshooting and technical support via phone, web based tools, email or in person.
- Perform general repairs and servicing of equipment or products.
- Develop customer-oriented documentation.
- Manage repairs and parts inventory while maintaining proper cycle counts.
- Maintain customer service complaint logs and information.
- Manage tools and test equipment inventory.
- Conduct root cause analysis which leads to effective problem solving.

Profile

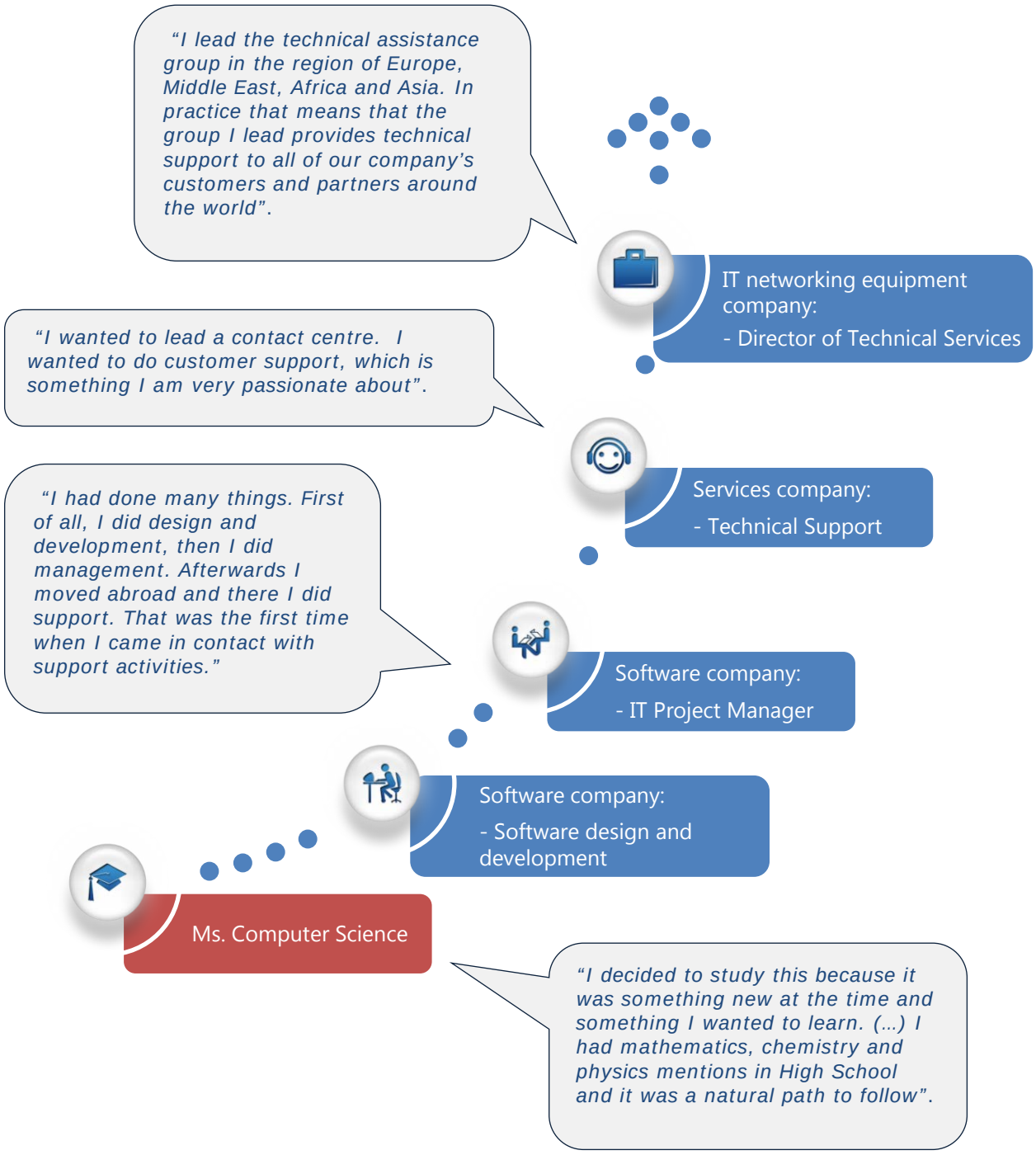
A technical support professional must hold a bachelor's degree in electrical or mechanical engineering, telecommunications, or related fields. Employers may occasionally consider candidates without a degree if he or she has suitable work experience.

Requirements (skills)

- Excellent customer care and communication skills. Ability to be a good listener.
- Strong troubleshooting skills are essential.
- Ability to learn new technologies quickly.
- Technical knowledge and system administration experience (databases, virtualisation software, remote support tools, servers, platforms, etc.).
- Ability to multitask effectively and work well under pressure.
- Strong organisational and time-management skills.
- Ability to work independently.

Career path

"For me technology has something very special: it enables a lot of things: it enables a lot of new medical treatments; it enables people having access to education; it enables intelligence in public sector; it enables things to make people more equal…and this is the very fascinating aspect of technology. And, of course working in support means you help people. Furthermore, we work with very intelligent people around the globe and everyone. It is a great opportunity to work with them".



NETWORK ENGINEER

Overview

Personal profile: a woman with strong technical, analytical, and problem-solving abilities who is willing to constantly learn and update her knowledge and skill set.

Professional profile: network engineers are responsible for designing and implementing communication networks.

Job description

Network engineers must be able to design, plan, install, and maintain, communication networks. This includes the maintenance and monitoring of active data networks, or converged infrastructure and related network equipment. Their goal is to ensure the smooth operation of communication networks in order to provide maximum performance and availability for their users, such as staff, clients, customers and suppliers.

Network Administrators focus on ensuring the integrity of the network components within a company's LAN/WAN infrastructure. Depending on the company and its size, the Network Administrator may also design and deploy networks.

Other job titles used to refer to this kind of work include network support, security engineer and network architect.

Responsibilities

- Design, plan, install and manage telecommunication network infrastructures and systems. Analyse and resolve faults.
- Maintain adequate security. Plan and implement future network developments.
- Ensure network performance optimisation.
- Provide training and technical support.

Profile

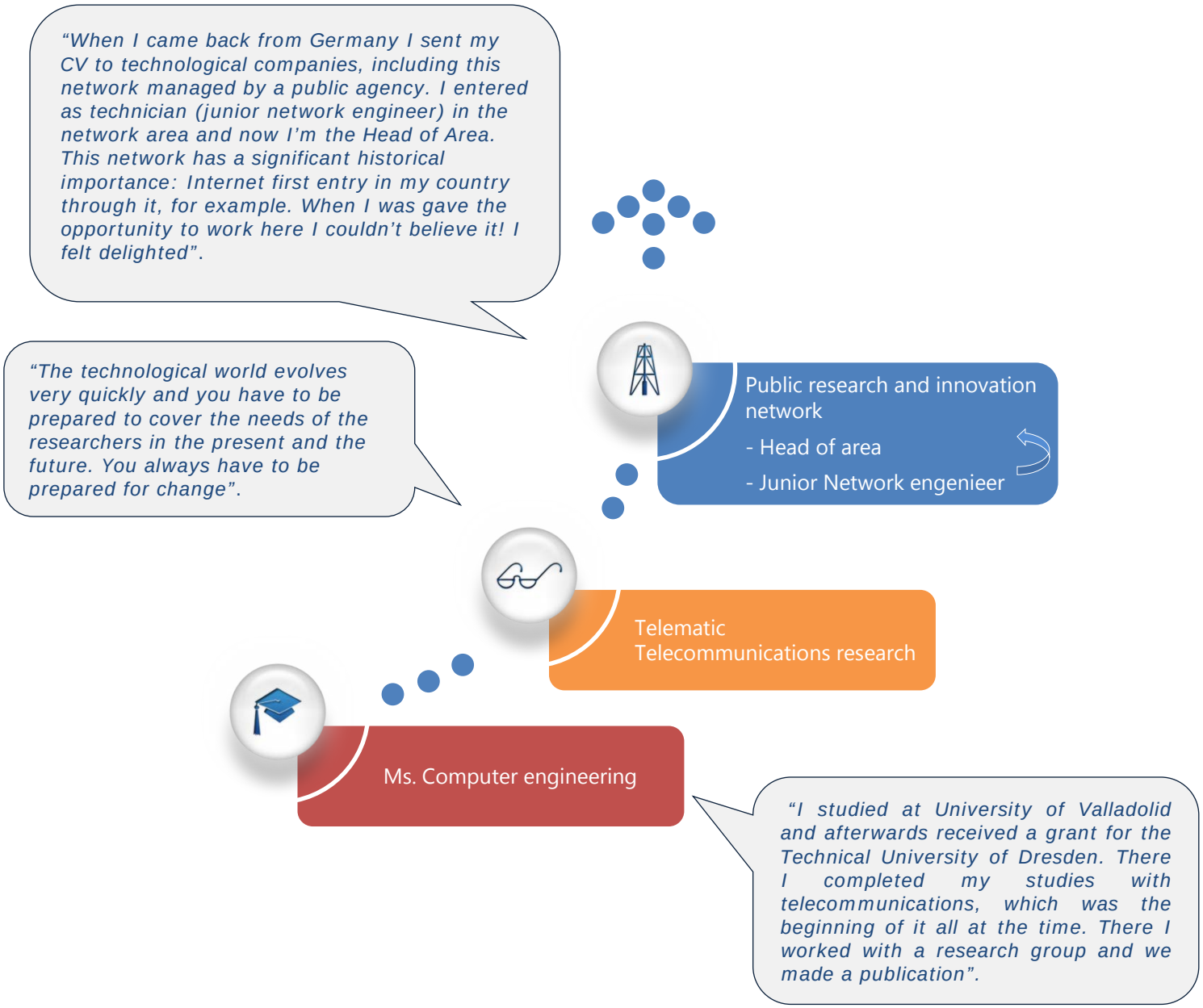
Most positions require a bachelor’s degree or higher in network design, electrical, telecommunications and computer engineering. There are also master’s programmes to specialise in network management and specific certificates depending on the area of network (LANs, MANs, WANs, etc.). Professionals with industry-recognised certifications such as CompTIA or Cisco are highly valued.

Requirements (skills)

- Excellent problem-solving skills and the ability to prioritise tasks.
- The ability to teach technical matters, and excellent IT skills.
- Good interpersonal and teamwork skills.

Career path

"The most rewarding aspects are personal satisfaction of understanding technology, solving problems… It is a challenge that motivates me and I don't stop growing and increasing my knowledge. I learn things constantly, new technologies and new protocols, etc.".



IT SYSTEMS ADMINISTRATOR

Overview

Personal profile: a woman with a passion for IT systems, strong managerial skills, and solid technical knowledge.

Professional profile: system administrators are in charge of the design, configuration, implementation, management, and day-to-day operations of an organisation's IT systems.

Job description

System administrators are those who install, configure, and maintain both the hardware and software components of information systems. Their work is also very closely related to all aspects of the security of IT systems.

Responsibilities

- Install, support and maintain new server hardware and software.
- Ensure the most cost-effective and efficient use of servers.
- Ensure that all IT equipment complies with industry standards.
- Install and configure application software.
- Ensure compliance with security policies.

Profile

Bachelor´s degrees in computer science or management information systems (MIS) are the most relevant educational backgrounds. Knowledge of business functions is also desired, along with advanced degrees in system administration. System Administrator Certifications are commonly required and highly valued, such as Sun Solaris certifications, ITIL, and Microsoft Certified System Administrator (MCSA) for those managing Microsoft server technologies. An example of another popular certification is Red Hat (RHCT), for companies utilising Linux technologies.

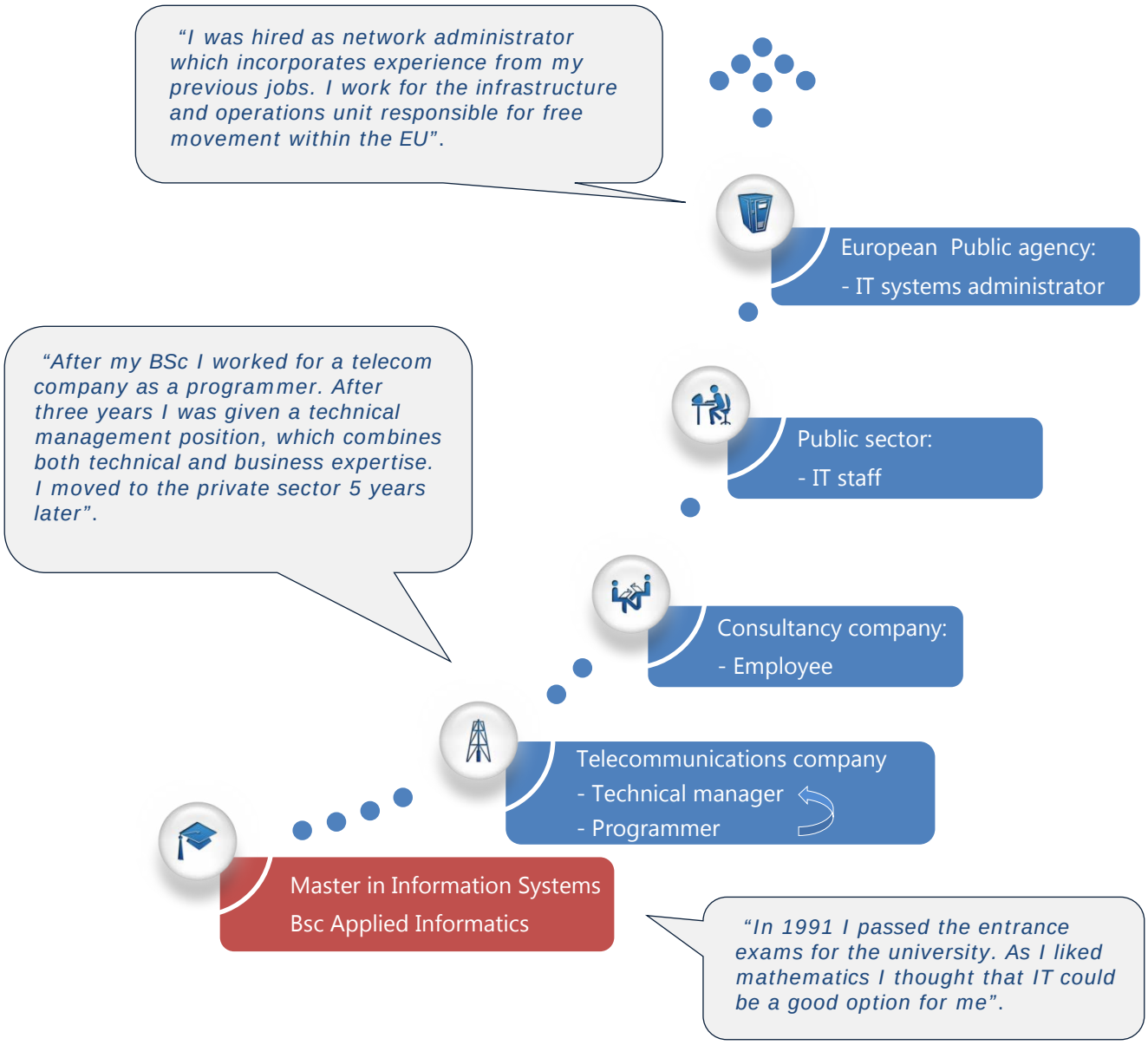
Other technical support roles, such as database administrators, desktop support technicians and network administrators provide an easy transition into an IT system administration role.

Skills required

- Great knowledge of the business side of IT.
- Strong understanding of computer security.
- Proven ability to assess problems and research solutions. Excellent organisation and technical documentation skills.
- Strong interpersonal and communication skills. Ability to work under pressure.

Career path

"When I started I thought that working in the IT was the same as being a programmer. I was surprised when I realised that this sector has a lot of different opportunities to offer: you can be a programmer, a consultant, a project manager and a lot of other very interesting roles".



VIDEOGAMES DEVELOPER

Overview

Personal profile: a creative woman who is passionate about videogames and design, who wants to create new ways of entertaining and be part of a multidisciplinary team.

Professional profile: videogame developers invent, design and create videogames. They combine a deep understanding of programming with artistic passion.

Job description

A videogame developer is essentially a software programmer who writes code for videogames and is responsible for making the game work properly. A developer may specialise in a certain videogame console (i.e. Wii, PlayStation 3, etc.), or may develop for a number of systems (i.e. PCs or smart phones). They can also specialise in certain types of games (i.e. role-playing video games or first-person shooters).

Responsibilities

- Create plot lines and character biographies. Design role-play mechanics.
- Write the code that runs a video game. They may also be responsible for writing the code of the development tools and software which is used to build the videogame interface and platforms.
- Work with a team of programmers, developers and videogame designers.

Profile

Videogames developers may hold a Bachelor's degree in computer science, software engineering, mathematics or computer information systems. In recent years specific degrees in videogame development have been launched in various European countries. It is common for videogame developers to come from professional backgrounds such as physics, artificial intelligence, or graphic design. Active involvement in open source software development projects is usually required.

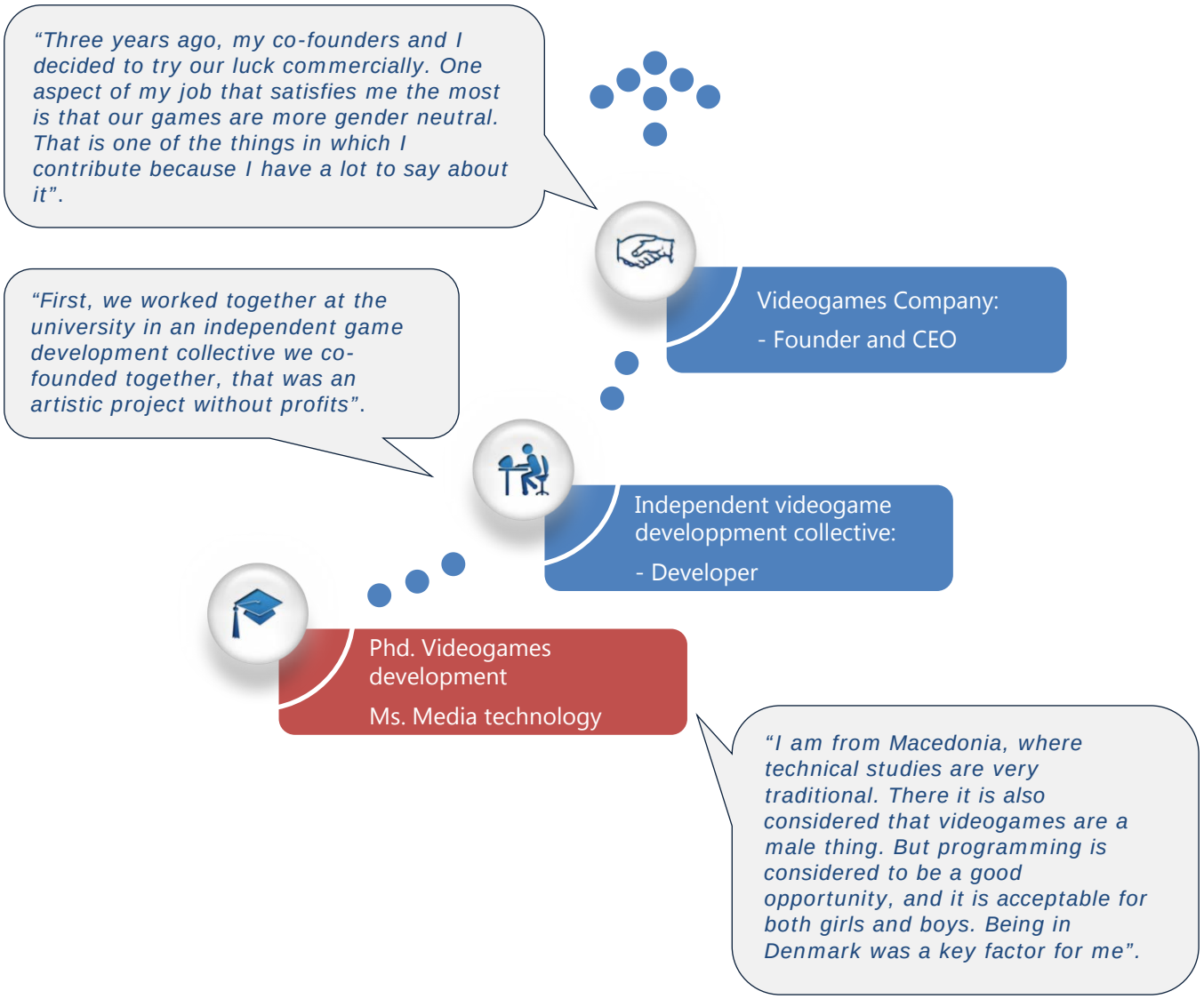
Experienced video game programmers may pursue training in management disciplines and shift towards managerial positions.

Skills required

- Creativity.
- Expertise in the key programming languages.
- Knowledge of Graphics Programming.

Career path

"I think it is an amazing industry because it mixes skills and it is international. There are people with different profiles and nationalities working in the industry so you can really grow as a person, and that is a point both for the girls and for the boys. I believe that it is a very interesting industry because of that. I think that being part of the industry right now makes you grow personally and professionally".



DIGITAL COMMUNICATIONS STRATEGY REPRESENTATIVE

Overview

Personal profile: a woman who has a passion for the Internet, excellent communication skills, and is an independent, creative, self-starter. She is also someone who loves sharing ideas with others and working in teams.

Professional profile: digital communications strategists are in charge of designing, planning and implementing all online communication activities of an organisation.

Job description

The digital communications representative manages the organisation's online strategy and activities. This includes planning and managing the organisation's digital presence, digital marketing, e-commerce and social media. Traditionally, digital presence was part of the marketing departments; however, its growing relevance has resulted in the creation of a new position with influence across the organisation.

Responsibilities

- Lead the organisation's digital strategy and manage its implementation.
- Monitor and evaluate outputs of the digital strategy.
- Implement the online community strategy, coordinating with stakeholders.
- Responsible for all digital content: editorial and visual.
- Responsible for the organisation's presence in social media.
- Develop guidelines, plans, and training programmes to ensure standardisation and coherence of all digital activities. Identify technology trends.
- Ensure engagement with all relevant stakeholders.

Profile

These professionals may come from very varied educational backgrounds, such as management, marketing, communication, journalism, public relations, computer sciences or telecommunications. These positions are open to any graduate with a strong passion for the Internet and the complex digital ecosystem. Communication skills, creativity, and strategic thinking are key attributes.

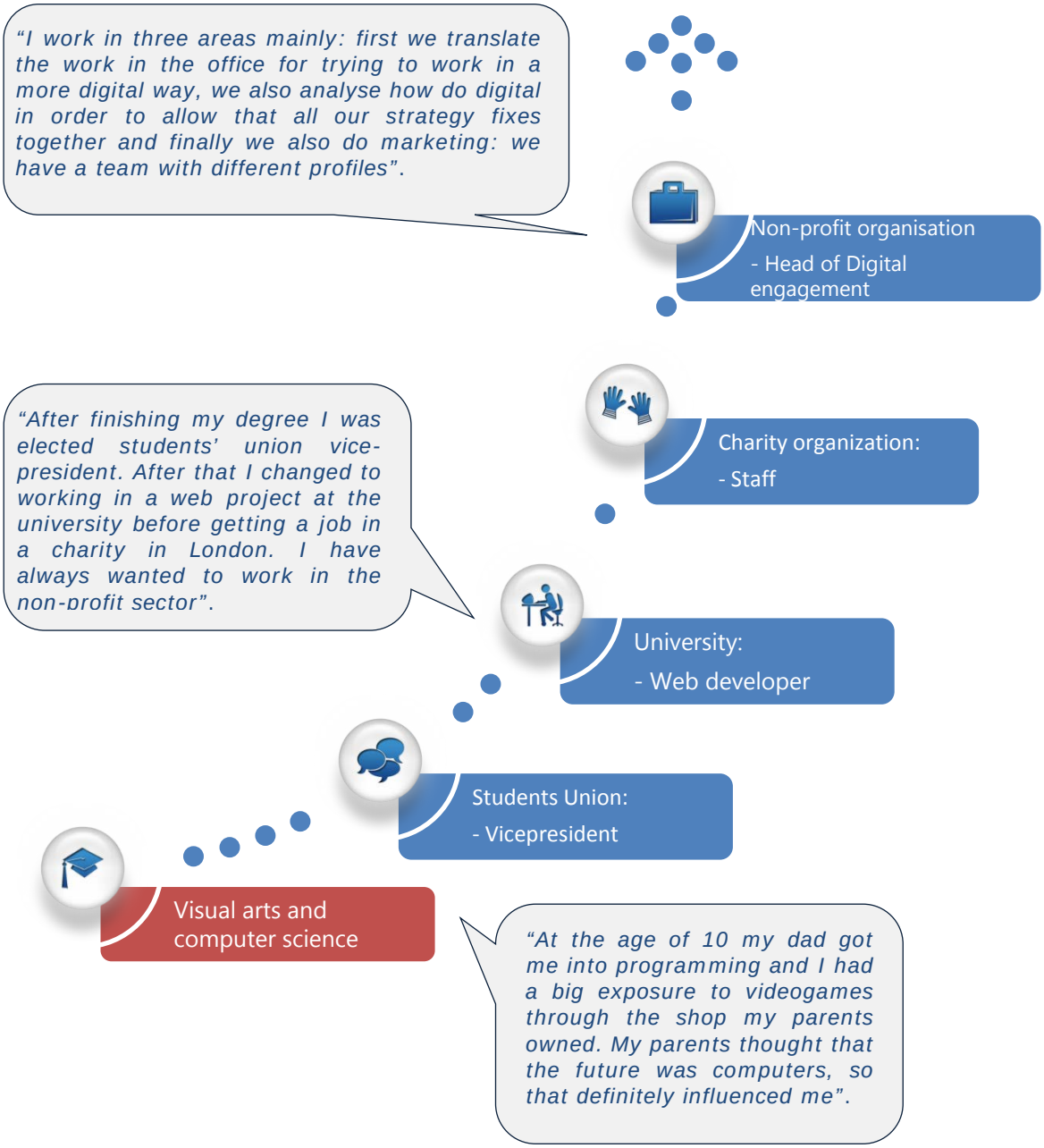
Skills required

- Very good interpersonal and organisational skills.
- Strong project management capabilities.
- In-depth knowledge and understanding of the digital ecosystem and online marketing techniques.
- Team player.

Career path

"A blend of creativity and technical makes a good mix. Working in digital is not just about the technology, you need to be able to think and be creative.

I knew that people who work with technology can be creative people. Some people might call some of the industry geeks but that doesn't mean they aren't fun and interesting".



ANNEX VII. TRANSCRIPTIONS OF INTERVIEWS

Methodology

In order to achieve the task of mapping the possible career paths of 10 ICT jobs indicated in the tender and to develop a deeper knowledge of the reasons which discourage women from entering and remaining in the ICT sector, 10 interviews are carried out with relevant women in the sector.

In drawing up the 10 ICT job profiles, balance between technical and less technical positions and backgrounds is taken into account. Finally, the selected profiles are as follows:

1. ICT company manager
2. ICT policymaker
3. ICT consultant
4. HR Responsible at ICT company
5. Software developer
6. Technical support
7. Network engineer
8. IT systems administrator
9. Videogames developer
10. Online marketing responsible

A search is developed in order to find a relevant woman for each position, who can act as a role model and inspire young girls. Other variable are also taken into account, such as age, country, public/private sector, etc. in order to take all the possible approaches to the problem.

A semi-structured interview is designed, since the aim is to capture the most relevant information provided by the women being interviewed. This template is included below.

Selected women are contacted and interviewed. These interviews are conducted face-to-face, via phone or via videoconferencing depending on the preferences of the interviewees. All the interviews are recorded in order to facilitate the transcription process. This annex has attached these transcriptions and some general conclusions.

Questionnaire

1. What is your current position? What does your job consist of?

Education

2. What is your educational background?
3. What kind of aptitudes do you think are more relevant to succeed in this case of studies? Who should study this?
4. Did your education and social environment influence this decision? Did any particular person have an impact on your decision? (Parents, teachers, a friend, a famous, etc.)
5. Did you find any reticence in your environment to choose this sector?

Career development

6. How has been your professional path until your current position? Tell us a bit about your previous working experience.
7. How did you end up in your organisation?
8. What are the main barriers you have had to overcome to reach your current position? Which ones do you consider to be related to gender?
9. In your opinion, what are the most rewarding aspects of your job in the ICT sector?
10. How satisfied are you with your current position and work in the industry? What are the main advantages for women compared to other industries or sectors?
11. What has surprised you from the sector? Meaning: did you have any stereotype about the sector or your job that experience has removed?
12. How easy is for you to conciliate your personal and professional life?
13. Have you fulfilled your professional expectations? Why?
14. How easy do you think it is for you to conciliate your personal and professional lives?
15. During your career, did you ever have the idea of giving up or exiting the ICT workforce? Why? Why do you think women do exit the ICT sector more often than men?

Recruitment

16. Are women underrepresented in your company/organisation? And in the technical area?
17. If yes, what do you think is the reason for that?
18. Has your organisation launched policies to promote women within your area? If the answer is yes, which ones?

Management

19. In your opinion, what are the advantages for companies to count with women among its workforce? And in decision-making positions?

Uptakes after leaves

20. Have you ever benefitted from maternity leave?

21. Do you think is it easy to keep updated during maternity leave?

Maturity

22. Would you participate in a campaign to promote women's inclusion in the ICT sector? Under which conditions?

23. Have you had a mentor? Do you think this figure could avoid that women leave the sector? And what about the networks of women in the ICT?

Inspiring others

24. Would you recommend girls to choose a career in the ICT sector? Why?

25. In your opinion what could be done to increase the participation of women in the sector?

26. Any final thoughts?

Interview I. ICT Company Manager

1. What is your current position? What does your job consist of?

I am the Director General of an organisation representing mobile network operators. I link this industry with two main things: the first one is the development of technical standards needed for mobile services to work and the second one is to work with governments and regulators to explain the specific challenges and opportunities that mobile brings.

In addition, we do two other things: we run major industry events and activities in emerging markets, where we are working with non-government organisations and other businesses to develop programmes around areas such as mobile agriculture and mobile for women, to name a few.

Education

2. What is your educational background?

First of all I must say that I am French and the French system has a strong bias to mathematics; if you show that you are able to do that, they push you in that direction and this is probably why I started in this field. After a few years, when I had to become more specialized, I decided to enter telecommunications because it was an opportunity to do new and different things. After that I did a PhD in Computer Science.

3. What kind of aptitudes do you think are more relevant to succeed in this case of studies? Who should study this?

You need to be comfortable with numbers and to be able to think in the abstract. But there are people who sometimes overestimate the complexity and the difficulty of studying science or mathematics. Also there is an image, which I think it is completely cultural, that this is "not for girls or women". In my experience it was never been the case, there is nothing either female or male about mathematics. It is just about what are you comfortable with: abstraction, theories, numbers…

Whenever I can, I encourage girls to study science and mathematics. I think lack of participation in these areas is often related to the lack of role models or a lack of understanding about what it entails, and I want to help break down these perceptions.

4. Did your education and social environment influence this decision? Did any particular person have an impact on your decision? (Parents, teachers, a friend, a famous, etc.)

I don't know. I like philosophy and literature quite a lot as well, but I think maybe the fact that my father is an engineer also was an

influence. I remember discussing with people about this issue and they always said: if you like both literature and mathematics, do mathematics because you will able to do whatever you want after all.

5. **Did you find any reticence in your environment to choose this sector?**

   No, not in my close environment, but I remember a story that my brother told to me: One of his friends said to him: I have heard that your sister is studying mathematics, is she really ugly?

Career development

6. **How has been your professional path until your current position? Tell us a bit about your previous working experience.**

   I started in Mexico working as an intern in the public telecommunications company of Mexico. I was in charge of looking at the IT processes and systems. I remember that information was entered on the system in all of the branches but they didn't have a connection to the central office, which I think is basic; they didn't have the same computers so they had to retype everything… But this was a long time ago – systems have evolved and now it is quite impressive to see them.

   That was quite interesting because it was a joint venture between companies from different countries and it was a great experience because I learnt how to get people with different business cultures and from different countries to work together.

   Then I worked for about ten years in the enterprise sector, mostly in the B-to-B side of telecom. I worked at first on a project to lay down cable under the oceans. It was for a big partnership investment program: some companies invest in one part of the cable and the other ones invest on the other side. And then I moved to another B-to-B company that initially served airlines and later became a company that provides telecom services to financial companies worldwide. So I spent about ten years in business to business.

   Then I moved to mobile. I was the head of the mobile service business unit of an important telecommunications company. This position including managing the mobile business across about 30 countries in Europe and in Africa and strategy, marketing…

7. **Why did you join your currently organisation?**

   First of all (two years before I become the Director General of this organisation) I was representing the company I worked for in the board member of this organisation. There are 25 companies represented on its Board and I was representing one of them.

But it became clear to me since the very beginning that it was an interesting thing, with interesting people. I believe that the biggest challenge in the mobile industry is to be able to compete worldwide with new players that can innovate quickly and deploy new offers and services globally. Mobile operators largely have a multi-local position: they can be present in a number of countries but they are generally domestic and never truly global. This is the place in which they can discuss the development of initiatives that for the collective benefit of the mobile industry.

This is why I applied for the position, because I think it is a very interesting commitment.

8. **What are the main barriers you have had to overcome to reach your current position? Which ones do you consider to be related to gender?**

   I think being a woman both helps and hurts. One of the things we have to be honest about is that there aren't many women, especially if you are in the technological side, and everybody sees you and remembers you, which is both good and bad. I remember when I was studying, a mathematics teacher said at the beginning of the year that he wanted a boy and a girl to go at the front of the class and to solve a statistical problem and I was the only girl in class: do you see what I mean with the over-attention?

   People see you and remember you. If you do good things they notice, but if you make mistakes, and of course you do, because everybody does, there is probably more weight, more pressure for you.

   Another thing is that when you are a young woman your bosses always think that you are going to have children tomorrow, they are always afraid of that. And then when you do have children the first question is always: how are you managing that? There is never a good time to have children so just decide when you want to have them.

9. **What are the most rewarding aspects of your job in the ICT sector? What are the main advantages for women in ICT compared to other industries or sectors?**

   I think this is a very dynamic industry, one that changes every day and it's great if you are interested in change and new things. The mobile industry is very new and it changes a lot so it offers the opportunity to learn exciting new things and for changing what are you doing at work as well. So I think is a great thing to join this industry.

10. **What has surprised you from the sector? Meaning: did you have any stereotype about the sector or your job that experience has removed?**

Not everyone in the sector is a "nerd". There are millions of people who are employed by this industry who program and do technical work, but there are many other types of roles in this sector.

Actually the reason why I joined telecom after doing research to gain a PhD is because I found research very interesting and creative, you have to solve very big complex problems, but you don't really interact with people that much. Clearly what I found in mobile is that I am always interacting with people: mobile operators, vendors, start-ups, clients, people of the Commission, people of the Government… You have lots and lots of contacts: this is about communication before being about software or IT or very technical things.

11. How easy is for you to reconcile your personal and professional life?

I guess it is always difficult. It is always difficult to manage any life with a job. One thing that helped me is that my mother helped me to understand that you will never be a perfect mother in any case. I think what is important to children is to make them feel sure that you will take care of them, to make sure they know that their parents love them and to make them feel happy.

I will never be perfect: I travel a lot and I am not there every day… But I think that there's a major challenge for mothers that want to be perfect, because whatever you do could be done better or differently.

I think this is about understanding that you can be a good enough parent even if you are not exactly the parent type that society thinks you must be.

12. During your career, did you ever have the idea of giving up or exiting the ICT workforce? Why?

Yes, whenever you are thinking about interesting jobs you think, what about moving to a different sector? But I think this is a particularly exciting opportunity because mobile is now a sector which is changing and it is impacting many other sectors. It is not just about the skills you can learn or the things you can do.

Sometimes there are opportunities for leaving the sector but clearly I think this is a sector that is becoming more and more connected to other areas.

13. Why do you think women do exit the ICT sector more often than men?

I think there is a trend for women to change for different jobs that maybe don't ask for so much time: become a consultant, or take a less demanding job, because they find that there is too much pressure in the job, they have to be perfect at work and in personal life.

I remember a number of women who I studied with, one after the other opted for different things: take a year off or take a part-time job. When you realized that there are a quite number of them you start to wonder why, and I think that this is because there is a very strong pressure in society for perfection: you have to be perfect at work, perfect at home and perfect in your personal life and it is very demanding to be perfect in many things: you can't be superwoman.

I think we need to realize that it is not necessary to be perfect, just to be good enough at work, at home and in your personal life. I don't know - I don't pretend to have the answer.

Recruitment

Now talking about your organisation in particular…

14. **Are women underrepresented in your organisation? And in the technical area?**

We are actually very well balanced: we have an equal number of men and women and the office has also a quite number of nationalities. We have multi-cultural and multi-gender environment, which is great.

But one thing that it is true here and in many other places is that there are women in the organisation but they are not necessarily in the higher levels. There were all males at the most senior level when I arrived. But we now have a chief strategy officer who is a woman, and we continue to work to hire senior women in our organisation. So we are trying to do everything we can to try to improve this.

Another thing is that in our events we try to increase the number of women who speak in our conference programmes. This is not easy because they often say that they have nothing to say, they are busy, they have another commitment…

15. What do you think is the reason for that?

I think this is in relation with the point I made at the beginning: as there are fewer women everybody will look at you more and this is an additional pressure. If she speaks at a conference, she better do a good job because otherwise people will say that a woman wasn't good enough and everybody will remember. So this is an additional pressure if you are the one among men.

And furthermore it is also related with the idea that women have to be perfect in everything: she has to be good-looking, she has to be nice, she has to be smart, she has to show that she can act like a leader…

Maybe these things make it difficult but we are trying to encourage more women to participate, to take this pressure out and to show the younger women that it is ok and that they have an opportunity in this sector.

16. **Has your organisation promoted policies to increase women's presence? If the answer is yes, what have those policies been?**

Yes, there are probably two: one is our initiative launched in 2011 that aims to provide women equal access to mobile, particularly in developing markets. Right now, they don't have the same opportunity to have access to a mobile as men, and to this kind of communication and technology, which enables to get job, to socialise… This is a very interesting program.

One of the greatest successes in this program is with a mobile operator in Iraq who undertook research studies to understand the habits of women when they use mobile phones, and developed offers and services specifically for their female customers, such as special discounts based on the length of time they talk, or a service that blocks potential harassers from calling or texting. They also offer a shop with female staff that makes easier for women to buy their phones and services. With this program they gained more than a million additional female customers in just a year.

The second program is an initiative which features conferences that bring together leading women in the sector to explore a range of subjects. Last year's event was held in Brussels and this year we will be holding it in the United States. This initiative also includes a range of networking activities throughout the year.

Management

17. **In your opinion, what are the advantages for companies to count with women among its workforce? And in decision-making positions?**

I think in general having a more diverse team is a good thing. If you have only women in your team, or only men, or only eastern people, or only lawyers you don't have the ideas that come from a more diverse team.

Furthermore, in the mobile industry, companies have female customers and it is quite important that you have people in your team that know what women look for in offers, know how to develop marketing, select mobile phones, etc.

18. **At this regard, do you think it is needed to design specific products targeting for women?**

We do some research about what customers want and don't want. When I was in charge of mobile business in my previous company one of the things I was responsible for was selecting mobile devices, selecting which are going to be put in shops and offered to customers. And the two first mobile phones I was given were pink, because I was

a woman, so I had to tell my team: no more pink devices! Just because I am a woman doesn't mean I particularly love pink!

I think for example in Japan the younger women customers segment likes butterflies, pink, etc. for their laptops, but in Europe we are quite different from Japan. I think it needs more work, more thought: not just assuming that if you are a woman, you would like pink devices.

19. Do you think that having women in the design teams will increase the demanding of these products? Do you think women consume technology different than men?

I think it is probably not a women versus men thing but I think that there is some segmentation: there are different type of things you do based on your age, there are different things you like according where you live, how much you earn… and gender is one of the factor but it is not the only factor.

I think it is about doing a good job in segmentation and if you have a diverse team doing that you have fewer possibilities of missing on certain things. I think having a diverse team makes it easier to be successful in designing and in marketing and in any area.

Uptakes after leaves

20. Have you ever benefitted from maternity leave?

Yes, I was working in the B-to-B at that time and we were just going through a merger and of course we were going for the assignments and defining who is going to take each job. I was pregnant at the time, and this made this assignment process a bit more challenging for me. But I had a boss who is a very good guy and he said to me that they weren't to treat me differently because I was pregnant and I was going to take a maternity leave, that they would give me a job and a good assignment when I came back from my maternity leave. But it didn't really work out that way because the guy that managed my job during my maternity leave liked my job and ended up keeping it. When I came back I was given another job that was as good as or maybe even better the previous one. But I will admit I felt a little stress when I came back and they had organized everything and there was a guy doing my job…

21. So maternity leave is still a big issue in women's career?

Yes, it is. But it is probably more perception that anything. I know a lot of women that come to me and they all have this question: how can you work and have children? But it works out. Maybe you can find somebody else doing your job but sometimes the job you get afterwards is a better job.

I mean it is more a perception from both sides: from yourself and from enterprise side, since we all think that it will change everything.

22. Was easy to keep updated during the leave?

It is true that this sector moves very quickly but at the same time the technology is very helpful. Thanks to your mobile phone or your laptop you can stay in touch with people.

It is true that the sector evolves very quickly but for example in France the typical maternity leave is between two and six months so it is not that long.

Maturity

23. Would you participate in a campaign to promote women's inclusion in the ICT sector? Under which conditions?

Of course I would like to support women in ICT and getting more girls to become interested in the sector. I am very supportive of that and I would be very happy to do anything that can help.

Inspiring others

24. Would you recommend girls to choose technical careers in the ICT sector? Why?

I think it is important for girls to understand how dynamic and exciting an industry ICT is. It changes a lot, it allows you to do anything, it's an industry that helps people to communicate, that changes the way we live our lives… so it is very fascinating. So I think it is a great sector to join.

25. In your opinion what could be done to increase the participation of women in the sector?

I think it is important that governments and companies focus on helping women see that are great career prospects here and talking to them about this and showing them some potential role models. Not perfect people, but just women who have found very interesting jobs and they're managing work and their lives and want to continue working in the sector.

Interview II. ICT Policymaker

1. What is your current position and what does your job consist of (in short)?

After resigning for Minister for Electronic Government of my country, I returned to the private business and I am managing a company which works in innovation, research and development. We are developing different types of telemetric systems. This is the first thing I am doing. The second is participating in mentoring programmes for new companies and entrepreneurs, especially in the ICT sector. I help them entering the market. And my third responsibility is business consultancy for government for the development of information technologies, e-government… I mostly work in the field of legislation. And I am also lecturer in e-commerce in three Universities of my country.

Education

2. What is your educational background?

I studied in a Technical University. I am engineer in construction. This is very far away from information technologies but the biggest part of my life I worked at telecommunications enterprises, and I worked in the area that developed Internet in my country so I had to study a lot on IT by myself: I did a lot of practical studies in this field.

3. How did you make this change?

In 1991, when my country became independent, there was a big economic crisis and I lost my job in my field and I entered the telecom company because of my expertise as systems engineer. I entered as a planner and after different courses I became Internet Services Director.

4. How was your assignment as Minister? Did you have a political career?

It happened because of my professional path. In 2003 it was been organized the Information Society section in my country under the Prime Ministry and they looked for telecommunication professionals and I won the public contest. Then they started to organise the Ministry for Electronic Government and I was invited to work at this Ministry. Eventually, when the Minister resigned, the Parliament promoted me as a Minister even if I didn't have a political path. I was actually the first Minister not coming from a political career, now this is becoming a tradition.

For me it was hard because I didn't have the support of a political party.

Career development

Focusing on your experience as Minister,

5. **What were the main barriers you had to overcome in this position? Which ones do you consider to be related to gender? Did you have any particular problem due to your gender?**

   I think the fact of being a woman in this sector is hard. Sometimes your opponents are not taking you seriously enough. However that can even become an advantage, because they do not prepare themselves properly and you can take advantages from the fact that they underestimate you.

   And this is even worst in IT because there are not a lot of women. I see this more when I'm in International environments, with people from Western Europe. I think that here there is more gender equity.

   But the main difficulty of this job relies on changing working styles. E-government changed a lot of procedures among civil servants and that needed a physiological change, which is very difficult to face in the public sector.

6. **While in duty, did you take any measure to improve the access of women to the ICT sector or to favour their careers?**

   This is not a problem in my country because a lot of women work in the IT sector and they work at different levels: they start programming and they finish in high managerial positions. They spend a lot of energy at work, sometimes much more energy than men to prove that they can do the same as men. It is harder because men don't need to prove anything. Women have to prove more to succeed equally.

   Our projects were orientated to all companies and citizens equally.

7. **From your experience as mentor of new companies, are women as entrepreneurial as men?**

   Yes, there are a lot of women undertaking new projects. I am very proud of young women even with small children who are doing the same things as men, and they have to work twice or three times harder because they have small children.

8. **In your opinion, what are the most rewarding aspects of working in the ICT sector and what are the main advantages for women in ICT sector compared to other industries or sectors?**

   I don't think that is a thing we have to worry about because some of my female friends who are in the sector have not academic training in IT: they are lawyers, economists… But they have joined the sector, maybe because it is developing very fast and it is a challenging, interesting and international job. Maybe those are the reasons why they have chosen the sector.

9. Why do you think women exit the ICT sector more often than men?

I have no examples of people who have left the sector, neither for women nor for men. The only person I know who left the sector was because she changed her lifestyle.

Uptakes after leaves

10. Have you ever benefited from maternity leave?

No, my children were born before I started work in telecommunications.

11. Do you think it is harder to keep update during the leave?

No, I don't think so. I think you can catch up with everything very fast.

Management

12. In your opinion, what are the advantages for companies to count with women among its workforce?

This has its pluses and minuses. Minuses are that women, especially those with children sometimes have private problems connected to their children and they can't come to work, so absenteeism can be higher. But this has a big benefit: when she comes back she works with double energy and finally the problem turns into a benefit. Furthermore, women are more active, more ambitious, just because they want to prove that they can do the work.

13. And what about decision-making positions?

Women working in this sector have a logical mind and an emotional mind, and they can use them equally. And sometimes the emotional mind helps finding better solution, because problem solving is not only a question of ones and zeros. And sometimes this is difficult to men, so this is the benefit.

Recruitment

Now talking about the companies you work or collaborate with,

14. Do you know what the recruitment policy in your organisation regarding women is?

No, we have no specific policies. And I am sure that none company in my country has this kind of policies because we don't have this problem. And I think this kind of regulation doesn't work in real life because everybody must have freedom to decide. Maybe there are some stereotypes that say that women are not appropriate for IT but I know that there are managers that chose women instead of men because we are more ambitious and we are ready to work more.

15. Are women underrepresented in your organisation? And in the more technical areas?

Yes. But this is because in my company we work with very electrical technology, and we don't have specialist women in this field. On the other hand, women are more in marketing and business development and in consultancy. In these fields I have problems finding men.

Maturity

16. Would you participate in a campaign to promote women's inclusion in the ICT sector? (Such as mentoring programmes, social media campaigns, women networks…)

Yes, I am ready to participate. I think I can do a lot even promoting women in ICT and take down stereotypes that exist in other countries, even in Europe. It is important to note that in 1995 in Europe in upper telecommunications companies we were just 5 women managers in the Internet field among 200 men.

Inspiring others

17. Would you recommend girls to choose technical careers in the ICT sector? Why?

You must have a logical and mathematical way of thinking. I recommend choosing this profession because it is a very fast growing industry. You can develop yourself.

18. In your opinion what could be done to increase the participation of women in the sector?

It has to start from governments, in the schools, because we have to take down stereotypes about professions and women. I was very lucky because my father taught me that I could do everything in my life. This is the beginning.

And of course the stereotypes that people have about IT: they normally think that they are people sitting alone with their computers. People in IT are normally very creative and very innovative. They have different hobbies.

And companies can make exchanges with other countries that still think that women are just created for children and for family to show that women can do a lot of things in IT, even from home because this is a field that allows women to work at distance. And it is important that people realizes that women can do the same work as men.

Interview III. ICT Consultant

1. What is your current position and what does your job consist of (in short)?

Actually, I have two different functions in my company. On one hand, I work in the business area. I am working at what is called strategic design consultancy. In that position I work in development, I give expertise to developers and guide them in a creative way to develop new products and services.

On the other hand, my other function consists on being a member of the Supervisory Board, which is a control body. We constantly get information on strategy, human resources, environmental topics, financial topics…

Education

2. What is your educational background?

I studied Business Administration in the University of Applied Science in Stuttgart. I finished the studies in 1992 with a Diploma.

3. How did you become an ICT (SAP) consultant?

After finishing my studies I worked in HR and after that I became and SAP consultant in a SAP partner company and I was working for a couple of years in the financial and controlling area with SAP software. I also spent two years in the US as SAP consultant.

4. Did you receive any specific training?

Yes, I actually took a course called SAP Administrator funded by the German Government that offered SAP training for people who either couldn't find a job after University or people who wanted a different orientation in their work.

Career development

5. How was did you first started working with SAP?

My sister was working in this business at that time and I just liked the type of job that she was doing as a consultant, it had a future and very good work conditions.

6. How has been your professional path until your current position? Tell us a bit about your previous working experience.

After working as a consultant in the US I came back to Germany and I worked for another consultancy company for a half a year and I had a lot of connections with my current company all the time so I finally ended here. I was offered a position within the company by one of my contacts.

7. **What are the main barriers you have had to overcome to get to your current position? Which ones do you consider to be related to gender?**

   That is a tough question. When women become pregnant people assume things that seems to be obvious. For example, when I become pregnant and I had my first performance review after it, - I was working part time -one of my managers said to me: "I can't give you the same good performance as the years before because you are here only half time". My answer was that because I was working half time I was getting half the money, wasn't that enough payment for that? And that had nothing to be with my level of performance. Why shouldn't I have the same rewards for it? Obviously he hadn't thought about it and he was kind of surprise and he said: "yes, it is a good point. Why should I punish you for not being here as much?" I was really socked because obviously he didn't think about it.

   I think there are many unconscious things people just assume, like that many things change when you have children. And even women who haven't children yet probably assume that the day that they have children they will not take that serious the fact of having a career.

8. **How satisfied are you with your current position and work in the industry?**

   I am really satisfied. I only work part time at the moment because I often have to prepare the decisions for the supervisory board and I have to spend some time on that.

   I like some things of the industry: you have big flexibility in taking the job you want. I am very free on making my choices in what I want to work.

9. **What has surprised you from the sector? Meaning: did you have any stereotype about the sector or your job that experience has removed?**

   People just assume that people that work in IT, even women, are kind of nerd. So far I didn't find any. I mean, there are people really very technical in language, however I didn't consider them as nerds: most of them are very open-minded, friendly, communicating…

   It is not the guy with the big glasses and the weird shoes and the shirt. I mean, we do have these guys but even they are normal guys, so I have been surprised by this.

10. **In your opinion, what are the most rewarding aspects of working in the ICT sector and what are the main advantages for women in ICT sector compared to other industries or sectors?**

    It is a great option if you feel that you need a different challenge and you want to learn something new. I also think working with technology

is really amazing: it allows making things work and become reality. You have always to be up-to-date in technology.

And we have actually very good working conditions and the financial situation of work can be really good, it's well paid.

11. **How easy is for you to conciliate your personal and professional life?**

    Working part time really helps and especially my company is really, really flexible: you can work from 50% to 80% and it is usually not a problem.

12. **During your career, did you ever have the idea of giving up or exiting the ICT workforce? Why?**

    Yes, but only to found my own business.

13. **Why do you think women exit the ICT sector more often than men?**

    I don't know. I think at my company that doesn't exist but I don't know. Definitely there are fewer women in technical positions but I think it is because not many women decide to study sciences, informatics… They usually choose other paths after school and I don't know if it is a common problem but in Germany I hear mothers saying: "my daughter is not good in natural sciences". But I think that if you hear that you are not good in natural science you will memorize that you are not good in natural science. But that seems good for them because they are normal women. BY hearing it all the time it becomes true, but it shouldn't be this way.

Recruitment

Now talking about your current company in particular…

14. **How transparent do you think the promotion policies in the ICT-consultancy sector are? And the salaries negotiation? Do you think this has an impact on the payment gap or in women's condition in general?**

    Not transparent at all. I don't think that makes women left the sector because we have good work conditions. But that could generate negative feelings: maybe you get paid not as well as men in comparable situation. I cannot complain about that because I think I have a good average. But in general women have this feeling that they earn less than men, even if it's not true.

Management

15. **In your opinion, what are the advantages for companies to count with women among its workforce? And in decision-making positions?**

Diversity in any kind of its versions improves problem solving of all companies. And on the other hand, I find that women in general are more empathetic than men. And if they have children they have a much more holistic view of life and work and they are also good managers because they have a good understanding of what drives their employees. But they might be more eager to look for new solutions to change things.

16. In what ways can women themselves contribute to improving the gender balance in top jobs?

We have to encourage others. Women in general are more doubtful when they have to apply for a managing position because they think that they are not able to do so I usually when see women like this I tell them: "just do it and you will learn by doing it". So I think that encouraging them is a very big point. Also promoting them, talk good about other women who are looking for new positions. We need to talk positively about each other, and not be negative among us.

Maturity

17. Would you participate in a campaign to promote women's inclusion in the ICT sector? Under which conditions?

In general yes. But it will depend on time and the way is done.

Inspiring others

18. Would you recommend girls to choose technical careers in the ICT sector? Why?

What I like the most is the range of options that I have. You will learn a lot, you are not tied to a specific area. You can really make moves and I really like that, having different options.

19. In your opinion what could be done to increase the participation of women in the sector?

This is a very difficult question. I really don't know. For my company perspective I would put the accent on the fact that women don't try to self-promoting themselves and they have to do it.

And we need a change of perspective from the society. That is about what I describe earlier that women don't enter in science. We need to encourage girls, maybe at schools. People say that she is like this or like that and maybe she is not like that at all but on repeating it she becomes that. And we do that very often. I think that probably lots of girls are good in natural sciences.

Interview IV. HR Responsible at Software Company

1. **In your opinion, what are the main advantages for women working in the ICT sector compared to other industries or sectors?**

   Flexibility. There is a lot of flexibility in the IT sector. People can work from home, so for me it is very family friendly.

2. **Why do you think women leave the ICT sector more often than men?**

   Women normally give more importance to personal connections, so they tent to choose jobs in which you have to work with other people. They don't like very much working by themselves.

Now talking about you company in particular…

3. **What is the recruitment policy in your organisation regarding women?**

   We have just introduced new policies. For example when there is a position that need to be covered, we always have to present at least 2 candidates, and diversity is an essential factor, minorities have to be represented and at least one should be a women.

4. **Are women underrepresented in your organisation? And in the technical area?**

   I know the data for the whole workforce and we have 30% female employees right now.

5. **Has your organisation promoted policies to increase women's presence in your company? If the answer is yes, what have those policies been?**

   We are working in reconciliation of professional and personal life. But not just for women because we think it is a big issue also for men from the new generations. It is not only the women who want to work part time or want to have more flexible working hours. Men are not willing anymore to work as many hours as they used to work in the past. I have already mentioned a policy regarding the part time: we do have very specific ones already in Germany but we want it to be expanded. We have also a policy regarding how offices should work, working from home and so on.

6. **How transparent do you think the promotion policies in the ICT-consultancy sector are? And the salaries negotiation? Do you think this has an impact on the payment gap or in women's condition in general?**

   We don't have a policy to that right know in this sense. But we are implementing a plan that will be finished by the end of the year.

7. **In your opinion, what are the advantages for companies to count with women among its workforce? And in decision-making positions?**

   We have seen many studies, like the ones from McKinsey, showing that gender balance in management teams generate 48% higher operating margins for example. The companies with women are more competitive, the performance is a lot higher: For top 50 companies with diversity client satisfaction is an average 39% higher, for example, and the productivity increases by 22%.

8. **How easy is for women to come back to the company after a maternity leave? Do you have any mechanism to keep women updated of the sector during maternity leave?**

   We in line with the legal requirements in each country but we consider very important to be keep in touch with women during the maternity leave because we do see that this is the time when we lose them: they take the maternity leave and they don't come back. So we are developing special programmes, for example, we have just launched one in India and another one in Germany…We stay keep contact with the women when they go into the maternity leave to keep her updated.

9. **Does your organisation participate or has participated in some form of public or private actions to increase the number of women in the ICT sector? Describe.**

   Right now we are launching a women's network, an innovation network for women in IT and we are also in European networks for women in IT.

10. **In your opinion what could be done to increase the participation of women in the sector?**

    We need to have more role models. We absolutely need to have more role models.

11. **Any final thoughts?**

    Women are underrepresented in STEM for reasons that tent to discourage women's participation. Some of the reasons are already studied and the most important ones have to be with the lack of role models and mentors on the top, this makes people ask why there are no more women in IT. There are many pre-conceptions that state that IT careers do not welcome women or people seem to think that women have other priorities as the family. There is a lack of role models and mentors also on high schools and colleges. And even in schools there are some social stigmas against girls entering IT.

    I think that is important. We are actually sponsoring the mentoring programme called MINT that comes from the government. It is a program to interest young girls to move into STEM studies. It is

especially hard in Germany to find candidates girls for our job offers, particularly the more technical ones. It is easier in India or in the US, so we have to work in this sense from schools.

Interview V. APPS developer / Young entrepreneur

1. What is your current position?

I am the CEO and co-founder of a company that develops web and mobile apps.

2. What does your job consist of?

We develop web and mobile applications for clients, mainly from the US. My main mission is to keep an eye on the projects, finding new projects, negotiating with clients, etc. On the other hand, I am also responsible for finances of our company and, since we are not a big company, a bit of everything.

Education

3. What is your educational background?

I attend one of the best high schools in Krakow, it was very technical but I didn't have much to do with computers at that time. I am not specialized in any area and I searched for something that joined culture and computers, and I found Human Computer Interaction in the Technology University of Krakow. First, I didn't know if this was my thing but I decided to try.

Human Computer Interaction mixes culture studies and computer science. So I had two types of subjects, first of them were cultural studies like philosophy and the other ones were more computer centred, such as programming… These kinds of courses are not yet very common in Poland, but now is becoming more frequent.

I started working when I was in my second year so, to be honest, I did not study that much. However, I managed to finish my studies only one year after I was supposed to do so.

4. What kind of aptitudes do you think are more relevant to succeed in this case of studies? Who should study this?

I think you need the abilities you need in all kind of jobs. When we are recruiting soft skills are also important for us. Is highly recommended to write correctly in English, because all our communications with clients are in English and we also need that our developers write nice fluent communicating emails. So it's not only about the educational background.

On the other hand, we need soft skills on technology and in many cases that is the problem with women, that if a girl is not specialized in something she says that she cannot do it or "I'm not good at". Boys always say that they are great at something even if they don't. So I think it is more an attitude, not a special skill.

Some of our best developers are not educated in computer science. One of them is a political scientist and there are others that are something similar but technology is their passion. They are just computer fans…

5. **Did any particular person have an impact on your decision of funding your own enterprise? (Parents, teachers, a friend, a famous, etc.)**

   A big part of my decision of going on with the company is of my co-founders and I think that finding great co-founders is the best thing that can happen to you: we modulate each other a lot to achieve more and to work harder.

6. **Did you find any reticence in your environment to choose this sector? Did you receive the expected support from your family/teachers when you communicated your career decision?**

   My parents were always very encouraging to me but I think that to certain extent they though "these kids are doing something, making some projects and they are having fun and earning some money on it". So they didn't discourage me to do so, they always, in some way tried to tell me that it was important that I finished my studies first, but they always were helpful and understanding with every decision I took.

   Regarding my teachers, to be honest I didn't have too much connection with my professors from the University and I never had an important person in my education, as a mentor or something like that.

<u>Career development</u>

7. **How has been your professional path until your current position? Tell us a bit about your previous working experience.**

   I used to work as a waitress and sometimes as a babysitter. My first job in the sector was already in my own company.

8. **How did you become an entrepreneur?**

   One of the co-founders found a summer job in Sweden developing applications. When his term was finished the guy of the enterprise in which he was hired ask him if he could outsource a project, and he needed somebody to work with on it. And then we opened the company because this was the only way for him to pay us legally.

   He suggested that to me and to the two other co-founders and we asked for some European grant (5.000 €) and that is how everything started. We just thought "let's try, if it works it is ok, if it doesn't we have like "another adventure" and we come back to study".

We didn't need much funding because we were students living with our parents and we were programming from home. We didn't need much structure.

We didn't know so much when we started, we were learning on the way, along the project, so you can imagine…the first project was like two moths delayed and it wasn't very good written, but we learn a lot. And afterwards we found another project and everything was easier.

9. What are the main barriers you have had to overcome to found your enterprise? Which ones do you consider to be related to gender?

I think the biggest barrier for us was to learn everything from scratch: we knew nothing about managing projects, talking to clients and managing other people. We learned everything on the go, from practice. I don't think gender was relevant in overcoming those problems. I only think that girls are less confident when they don't know stuff.

I had to learn to talk to clients, to do business and in my case it was harder to me but I think is due to my personality…so I don't think it was harder just for being a girl.

10. How satisfy are you with your current position and work in the industry?

I am very happy with my work. I learn a lot and there is always something new. We are 25 young people working in what we enjoy and there are very good perspectives for the future.

11. What has surprise you form the sector? Meaning: did you have any stereotype about the sector or your job that experience has removed?

I was in the sector from the beginning so I didn't have time to build a stereotype. Anyway, in my company we try to take down the stereotypes around applications developing companies: in our web site we have a description of all our team, in which we provide information about their hobbies and we also try to write a lot in the social networks. This is very important to us because we are an outsourcing company working a lot with the US, so we need to be visible and close to our clients.

12. In your opinion, what are the most rewarding aspects of working in the ICT sector?

The most rewarding aspect of this sector is the people you can find in it: they are smart and very motivating. Furthermore, I find very rewarding when you program something and it works, I mean, there is a problem and you can solve it.

13. **How easy is for you to conciliate your personal and professional life?**

    I work a lot, but I think in the future it will change because the balance and the focus will be different. Balance will be difficult but possible because it's my passion.

14. **In your opinion, what are the main advantages for women in ICT sector compared to other industries or sectors?**

    I think the advantages are the same for the boys and the girls and I would like to say that this is not only programming, there are other fields in the sector. It is a very open sector, fast developing and the most exciting one.

15. **During your career, did you ever have the idea of giving up or exiting the ICT workforce? Why?**

    Not at all. I can't imagine myself doing any other thing.

16. **Why do you think women do exit the ICT sector more often than men?**

    I don't have the feeling this is true. Women now feel attracted to the sector.

Recruitment

Now talking about your organisation in particular…

17. **What's the recruitment policy in your organisation regarding gender?**

    We don't have a policy regarding gender.

18. **Are women underrepresented in your organisation? And in your technical area?**

    Yes, we are 7 girls among 24 people.

19. **What' the reason, in your opinion?**

    I think it is a question of job offer: when we offer a job we receive very few female curricula.

20. **Has your organisation promoted policies to increase women's presence in your company? If the answer is yes, what have those policies been?**

    I don't really like those kinds of policies. We value CV's by its quality and gender is not an issue. Women should be interested in the sector by themselves and for what we offer, and that's what we do.

Inspiring others

21. **Would you recommend girls to choose technical careers in the ICT sector? Why?**

Yes, of course. It is a very innovative sector and it is very interesting. There also still few women so we need more on board!

22. In your opinion what could be done to increase the participation of women in the sector:

I think it is necessary to encourage girls to choose technology by telling them that they are equal to boys.

Interview VI. IT Support specialist

1. What is your current position? What does your job consist of (in short)?

As a Director, Technical Services EMEAR I lead the technical assistance group in the region of Europe, Middle East, Africa and Russia. The Technical Assistance Centers (TAC) provides remote technical support to all our customers and partners. We support them during business hours coordinating with others groups to give 24 hours support, that means that the global support service is open 24 hours by 7 days while none of ours centres is open 24 hours a day. We don't close at public holidays because the customers do not close either.

Education

2. What is your educational background?

I have a Master Degree in Computer Science.

3. When did you decided to study Computer Science? Why?

I decided to study this because it was something new and something I wanted to learn. I had mathematics, chemistry and physics mentions in High School and it was a natural next step. There were only two women in my class when I studies, it was something very new.

4. Did you find any reticence in your environment to choose this sector? Did you receive the expected support from your family/teachers when you communicated your career decision?

They found it totally normal. They were very much supportive. I was a very good student in High School so I think they would have been disappointed if I hadn't done something with my chances.

5. Did any particular person have an impact on your decision?

I grew in a small place and there people don't make an extensive career planning. I think two different things influenced my decision: One, I am very interested in cultures, so I found interesting working abroad and this influenced somehow my career. The other thing is that at certain point I wanted to change from technical to a less technical position.

For me technology offers something very special to the society: it for example enables new medical treatments; gives people better and easier access to education. In many aspects makes people more equal…and this is the very fascinating aspect of technology. And, of course working in support means you help people. Furthermore, in the technology sector you have the opportunity to work with highly skilled people from around the world – bringing back the multi-cultural aspects I was referring to earlier.

Career development

6. How has been your professional path until your current position? Tell us a bit about your previous working experience.

I had done many things. First of all, I did design and development, then I did management. And when I moved abroad and left Finland, I moved to a company in which I did support. That is the first time I came in contact with support activities. Afterwards I came to my current company (12 years ago) both to do support (external customer support) that is something I am passionate about, and to do managerial tasks so that is when I left totally a technical career. Well, totally is a strong word, I lead the technical function but I don't use my technical skills anymore.

Changing from a technical to a managerial position was a very conscious decision. When you want to achieve things you have to make personal decisions.

7. Why did you join this company?

They gave me the opportunity of doing the things I wanted to do next: I came here to lead a contact centre, and I had never been in a contact centre before. I have taken lot of decisions to make things I haven't done before. I am curious to do new things just to learn them.

Besides, I love our values: I love the way we do business, the way we care about people. It is not only the technology; it is also the corporate culture.

8. What are the main barriers you have had to overcome to get to your current position? Which ones do you consider to be related to gender?

No, externally not. I think I have some personal characteristics that are not typical for women and I think these characteristics have influenced the way my career has developed. There are people that find gender a limitation factor. I worked in three or four companies and in none of them I felt that my gender was a disadvantage.

However, some female characteristics can be seen in business environment as less effective. Furthermore, women highlight the things they haven't done yet and men highlight the things they can do.

9. You normally supervise more men than women; have you ever felt that they would work different if they were under the management of a man?

I think so and I think different things are expected from a female leader, not better or worse, but different. I have seen a study on the Internet which talks about female employees working for female managers and female employees expects their female managers to be

more sensitive about how do they feel. This is expected and accepted. However people don't necessary expect their male manager to ask how are you felling today? And they might even not feel comfortable with this question. I do think people respond differently to a female manager, but I don't think this is a disadvantage.

10. How satisfied are you with your current position and work in the industry?

I feel challenged. There is always a new thing you can do better, you can learn, you can achieve…This is important to me. I am motivated, I feel passionate about what we do.

I am very surprise with the strong decline of women entering technical studies and entering the market place from technical studies. I think we are not describing ICT industry as something attractive for women: not everybody has to be technical to work in ICT: you can also work in the sector and being very close to technology without for example designing products by yourself. We offer both technical and nor technical careers.

11. What has surprised you from the sector? Meaning: did you have any stereotype about the sector or your job that experience has removed?

Well there are many stereotypes. For example: it is said that this is a sector very male dominated and it is true. It is also said that the people who work in the sector are nerds and geeks and this is probably also true: we like new technologies; we have lot of technology devices… But it doesn't mean that we are not communicative. We are in technical support so our engineers must be effective in soft skills. We serve our customers.

12. In your opinion, what are the most rewarding aspects and the main advantages for women in ICT sector compared to other industries or sectors?

Work related flexibility and work-life balance. Our schedule often allows you to find a balance: you can go to the dentist and follow with the work later. It allows me, I have a family, to organise myself better. But I don't think this is necessary linked to the IT sector.

Working in ICT allows you to have access to continuous learning. Every day you have the opportunity to be challenged and to learn. And also women have the challenge of the lack of female role models, the lack of gender specific support. We have a support network but it is mainly by male.

13. How easy is for you to reconcile your personal and professional life?

Prioritizing is critical. I have work related flexibility, however at the same time my family also needs to be flexible; a supportive family is a must. I am married and have two children. , Without the support of my husband it would be very challenging to successfully combine my personal and professional life.

14. During your career, did you ever have the idea of giving up or exiting the ICT workforce?

No, I haven't.

15. Why do you think women exit the ICT sector more often than men?

More than leaving the sector, we observe a flow between technical and non-technical positions; women transitioning from technical to non-technical roles. Encouraging women to build technical careers is critical to the diversity of our work force; and one of the key talent challenges for the sector.

Drivers we've observed include lack of role models, limited gender specific networking opportunities, as well as the investment you need to make to remain up-to-date in this fast moving industry; constantly updating your technical skills to stay current.

Recruitment

Now talking about your current company in particular…

16. Do you know what the recruitment policy in your organisation regarding women is?

There are different corporate targets. We do have an inclusion diversity target, to assure that we look for diversity in many contexts, including gender. Besides we have a network for women working in the company, and there are others to support employees to do networking.

17. Are women underrepresented in your organisation? And in your technical area?

In my area we are about 10-15% women.

18. What is the reason, in your opinion?

The first reason is the percentage of Cvs we received: female percentage is extremely low. We required people highly qualified and we find very challenging to create a female pipeline. We have to create short prescriptions to become more attractive for women: we actively participate in female groups to find talent.

And we have another disruption (specifically in my function), we are centralized, so we only hired in Brussels and in Krakow which means

that if you are not living in these places you have to move. This could be a higher pressure for women than for men.

Management

19. In your opinion, what are the advantages for companies to count with women among its workforce? And in decision-making positions?

This has been studied a number of times and it has been proven that companies with more diversity generate more revenues. So it is attractive for business. Based on my personal experience combination of different thinking styles within a team also create better decisions.

Within a global organisation work force diversity is also a critical enabler for global and diverse thinking. A diverse team is more accustomed to different thinking styles, different accents, different cultures, and so forth … simply because you are working with people different from you. This awareness is a foundational when servicing global customers. Our team needs to be very sympathetic to all the characteristics of our clients: religion, accent, views… Diversity enables working more effectively with others and this is the reason why it is very important to create a very diverse workplace.

20. In what ways can women themselves contribute to improve the gender balance in top jobs?

I observe that many women don't invest enough time in developing and managing their business related network. Part of career effectiveness is managing the network that is willing to invest in your development, support you on your career journey, sponsor you when required, and give you opportunities. And then it is important to have the courage to take the opportunity when it is offered.

Uptakes after leaves

21. Have you ever benefitted from maternity leave? Was it easy to keep update during the leave?

Yes, I had two maternity leaves. At first I was scared of being out and loose contact. But things move on but they don't move on so much. Sometimes it is more about the pressure we put ourselves. The important thing is that women who take maternity leaves return.

Maturity

22. Would you participate in a campaign to promote women inclusion in the ICT sector? Under which conditions?

Yes, but I need to confirm case by case.

Inspiring others

23. Would you recommend girls to choose technical careers in the ICT sector? Why?

ICT enables so many things: from incremental capabilities for education, health care and mobility to better opportunities for those who would have less otherwise… Being part of this innovation journey is an opportunity to try to change the world. And it is very attractive to know how things work and improve.

It is often seen as the development of software or applications and not like how was all this created, and how this can be used.

24. In your opinion what could be done to increase the participation of women in the sector?

People make career choices at some point in the High School or early at University years, thus our schooling system has a key role in positioning ICT as a valid career option – also for women.

Companies also have a role to plan, and need to pay special attention to the needs of women in workplace – building job roles and career options that are valued by women, as well as communicating more effectively why careers in ICT are attractive for women.

Interview VII. Network engineer

1. What is your current position?

Head of the Network area at a public research and innovation network.

2. What does your job consist of (in short)?

My job consist on coordinating all the actions aimed at making the communications network of the Spanish Universities and Research Centres work properly and to monitor it in order to ensure that it can provide support to new research projects.

The network I work for is the Spanish academic and research network that provides advanced communication services to the scientific community and national universities. It has over 400 affiliated institutions, mainly universities and public research centres, and provides the telecommunication infrastructure that allows them to work together, so my work consists on making that network work well and preparing it for future projects.

Education

3. What is your educational background?

I am a computer engineer. I studied at University of Valladolid and afterwards I went with a grant to Germany, to the Technical University of Dresden. There I completed my studies with telematic telecommunications, which was the beginning of it all at the time. There I was working with a research group. As a result of that investigation we made a publication. After that I came back to Spain and as soon as I was here I found a job here.

4. When did you decide to study media and ICT related topic? Why?

While I was in High School I preferred the most technical issues. I dismissed languages and history, health sciences… I realized that I prefer mathematics and physics.

And then, when I chose my degree, I realized that the one I prefer was this and I thought that it would be the one in which I would feel more comfortable.

5. What kind of aptitudes do you think are more relevant to succeed in this case of studies? Who should study this?

The thing I like the most from mathematics and physics was the fact that everything matches. There were theorems and if you have a difficult numerical problem you can find the solution. I liked to see that with operations and formulas you can reach to an explanation: everything matches. I feel very comfortable with that and besides I was good at it.

6. **Did your education and social environment influence this decision? Did any particular person have an impact on your decision? (Parents, teachers, a friend, a famous, etc.)**

Concerning teachers, not especially. I didn't have any teacher who fascinated me and then I decided to study sciences.

7. **Did you find any reticence in your environment to choose this sector? Did you receive the expected support from your family / teachers when you communicated your career decision?**

My parents have always supported me and this is essential at the beginning of your studies when you think that this is too difficult. Having an environment which supports you and tells you that you can move forward is very different that if they tell you: leave it, that is not for you. This is essential, particularly at moments of weakness, when your self-confidence falters. Without this support maybe I could not have done what I have done. When I went to Germany they helped me persuading me that I was able to go and live abroad for so long.

Career development

8. **How has been your professional path until your current position? Tell us a bit on your previous working experience (years of experience)**

When I came back from Germany I sent my CV to technological companies, included this one. I was working in a company in Madrid for a month and after that I entered here. I enter as technician (junior network engineer) in the network area.

9. **Why did you join this organisation?**

First of all, this network has a significant historical importance. Besides it is associated to technology innovation: Internet first entry in Spain was through it, every technological development, innovations, new services… everything was first applied here. It always has been the model. During my degree I had subjects with a specific part dedicated to this network.

When I was gave the opportunity to work here I couldn't believe it! I felt delighted. So I have been here since 1998.

10. **What are the main barriers you have had to overcome to get to your current position? Which ones do you consider to be related to gender?**

I think that I would have had the same challenges if I had been a man: changes in the management, implementation of new technologies… The technological world evolves very quickly and you have to be self-learning all the time. You have to be prepared to cover the needs of the researchers in the present and in the future. You

cannot be the one who stops the development of the network. And there it is the difficulty: you have always to be prepared for change.

On the other hand, the management has been changing depending on the entity we work for (we depend on a public corporation depending from the Ministry of Industry): procedure for tenders, for contracting services, lines, people…

So these have been the main challenges: the technical one and the managerial one. Furthermore, the fact of being a public service also has a great influence. This has a lot of implications: budgetary and managerial. You have to convince the managers to obtain funds for your investigation.

But I didn't feel these problems had nothing to be with my gender. Maybe the fact of working in a public entity also has some kind on impact in the barriers I have found -in a positive way, since discrimination is lower in the public sector-.

What I see is that in ten people meetings with equipment makers or telecommunications suppliers I am the only woman. Therefore there are few women in private companies of this sector. Normally it is supposed that a man technician is more prepared or maybe bosses decided to promoted men because they thought that if they have to be 8 or 10 hours working they are not going to have problems and a women will have. I don't know, it is only a feeling that I have.

11. How satisfy are you with your current position and work in the industry?

I like very much my work, it has its disadvantages but at the end I am satisfied, because I like very much what I do. I enjoy a lot doing this work and this compensates crisis moments or disappointments that you could have, but I think this happens to everybody.

12. Have you fulfilled your professional expectations? Why?

Perhaps I could have a higher responsibility role; here I am a bit limited. But in the technical way here I was given the opportunity to learn things that in other companies I couldn't have done. And this also compensates.

13. What has surprise you from the sector? Meaning: did you have any stereotype about the sector or your job that experience has removed?

No, not in general. But maybe my vision is a little distorted because this organisation is linked to academic circles and very close to Universities so I am seeing what I saw during my degree. I am still moving among people very similar to those I met at the University.

14. Do you think that you could suffer any discrimination for being a woman?

During my degree I have never seen any kind of discrimination. And I never thought that they could discriminate me. I only thought that I have to be good at my job. I have never thought that for being a woman I was not been able to enter in this network, for example.

When I joined this organisation there were so many technologies that I felt overwhelmed. For me it was a challenge to catch up with all these. The challenge was getting the technical knowledge to prove that I was able to do this job, but not for the fact of being a woman.

I believe that you don't have to feel fear because you are a woman. The best is to concentrate in your stuff and don't think about it.

15. In your opinion, what are the most rewarding aspects of working in the ICT sector?

Personal satisfaction of understanding technology, solving problems… It is a challenge that motivates me and I don't stop growing and increasing my knowledge. I learn things constantly, new technologies and new protocols, etc.

16. In your opinion, what are the main advantages for women in ICT sector compared to other industries or sectors?

It depends on the woman. If you like technology and you have curiosity as I mentioned before it provides you this constant knowledge. What is frustrating is not doing it even if you like it. If you feel attracted of this it will give you all possible satisfactions.

17. How easy is for you to conciliate your personal and professional life?

This job has the normal requests of working by projects and sometimes it is complicated, it depends on the project. Achieving deadlines and milestones requires that you have to be available out of normal working hours (Systems work 24 hours). It doesn't happen too much, but you have to be prepared. Furthermore we also travel a lot.

You have to be prepared to make sacrifices, maybe more than in other jobs.

18. During your career, did you ever have the idea of giving up or exiting the ICT workforce? Why?

Not really. Everybody has a bad day but I don't think of getting out. This is what I like and I cannot imagine me doing anything else.

19. Why do you think women exit the ICT sector more often than men?

There is a lot of stress and there are work peaks that require sacrifices. If your environment appreciates that and you have personal fulfilment, you will stay. Temptation of abandoning comes when sacrifices aren't returned. Lack of satisfaction can carry you to withdrawal. It is also important that your environment appreciates your effort: your bosses, your family…

Satisfaction has to compensate sacrifices and the effort of constant training and technical updating.

Recruitment

Now talking about your organisation in particular…

20. Do you know what the recruitment policy in your organisation regarding women is?

I don't know any specific policy concerning this issue, but I have never seen any discrimination. When I am hiring I only look at the CV.

21. Are women underrepresented in your organisation? And in your technical area?

In general there are more men, and even more in my department.

22. What's the reason, in your opinion?

Because there are by far more men candidates than women ones, so it is normal that there are fewer women. It is a statistical matter.

23. Has your organisation promoted policies to increase women's presence in your company? If the answer is yes, what have those policies been?

No, as far as I know.

Management

24. In your opinion, what are the advantages for companies to count with women among its workforce? And in decision-making positions?

I think I will present this issue in the opposite way: why are they going to renounce to women? They will renounce to very capable candidates. For me the focus should be on profile, not in gender.

25. In what ways can women themselves contribute to improving the gender balance in top jobs?

I have never thought on this. I think it is very difficult if you don't have the chance. I believe that the most important thing is to have a good educational background because maybe they are going to require you to prove more technical skills than if you were a man.

Uptakes after leaves

26. Have you ever benefitted from maternity leave?

No, I haven't

27. Do you think it is easy to keep update during the leave?

Our environment makes it harder because it is very changing. Furthermore, my position, as I am head of unit, makes it even harder. There are people in my team who have taken leaves and they don't have problems to reincorporate, but it is true that it is more complicated if you have responsibilities.

Maturity

28. Do you participate or have participated in some form of public or private actions to increase the number of women in the ICT sector? Describe.

No, I don't. I don't do that for a matter of time but there is a national association in which I am interested: scientific and technical women association.

29. Would you participate in a campaign to promote women's inclusion in the ICT sector? Under which conditions?

Yes, I would be very interested. I really want to inspire and impulse my nephews, for example, because I see a generation without motivation.

30. Have you had a mentor? Do you think this figure could avoid that women leave the sector?

I have never had a mentor but I had something similar in the fifth year of my degree, when I worked as intern in a company and my responsible was a woman who was for me like a reference.

These references inspire people, both men and women. This could help and are very important to young people nowadays. More interesting role models are needed.

Inspiring others

31. Would you recommend girls to choose technical careers in the ICT sector? Why?

It has to be a personal motivation. If they like the sector we should say them that they are capable of doing anything they want, because they have the same capability.

Self-confidence is needed and I think this is the point in what we should encourage them.

32. In your opinion what could be done to increase the participation of women in the sector:

I think the most important is not to put barriers. I mean, governments must eliminate barriers; the rest is on the women themselves. It is

needed to identify why women do not progress in the sector and eliminate the obstacles identified.

Interview VIII. IT Systems administrator

1. What is your current position?

I work for the infrastructure and operations unit responsible for free movement within the EU. We are responsible for the operational management of large-scale IT systems in the area of Freedom, Security & justice i.e. the Schengen Information System, the Visa Information System and Eurodac.

2. What does your job consist of (in short)?

I was hired as network administrator as a hold related experience from my previous jobs. Among others, this Agency is in charge of the maintenance of the network related to the free movement within the European Union. I currently work for the infrastructure and operations unit.

Education

3. What is your educational background?

I come from Greece and I studied in the Athens University of Economics and Business. I hold a BSc in Applied Informatics and I also have a Masters Degree in Information Systems.

4. When did you decide to study Informatics? Why?

In 1991 I passed the related examinations to enter the University. As I liked mathematics thought that IT could be a good option for me.

5. What kind of aptitudes do you think are more relevant to succeed in this case of studies? Who should study this?

I think you have to like and have structural thinking. For me the mathematics discipline help a lot in thinking in a structural way. If you have such a thought in your mind you can choose these studies, for sure.

6. Did your education and social environment influence this decision? Did any particular person have an impact on your decision? (Parents, teachers, a friend, a famous, etc.)

Not particularly. Moreover, ICT was not that much known at that moment.

7. Did you find any reticence in your environment to choose this sector? Did you receive the expected support from your family/teachers when you communicated your career decision?

There was not a reaction in this sense. My parents wanted me to study what I liked. They were very open and did not force me to follow any particular studies they would prefer. I was very lucky.

Career development

8. **How has been your professional path until your current position? Tell us a bit about your previous working experience.**

When I finished my B.Sc. studies I first worked for a telecommunications company, in the area of European Union research projects where I started as a programmer. After two to three years I was given a technical manager position so I moved ahead in combining technical and business expertise. After almost 5 years I left this company and I moved to a consulting company dealing with business analysis in the ICT sector. After that I moved to the public sector: I applied for a related position and I moved to the IT Division of the Hellenic police, working as specialized IT staff.

So, I have worked in the private and public sectors and I also have been in different ICT positions: programmer, project manager, ICT consultant, etc.

9. **What are the main barriers you have had to overcome to get to your current position? Which ones do you consider to be related to gender?**

In my opinion, in the ICT sector there is a kind of lack of trust in women. I believe this is a, more or less, male-dominant sector. When I started working I was surrounded by men and I had to prove that I was as also good in achieving the goals set by the upper management. I think that this issue has changed now. But there is a lack of trust in the technical abilities of women in the companies. Women have to prove that they can do the same work that men can do.

10. **How satisfied are you with your current position and work in the industry?**

I am satisfied. In my current position I can learn a lot of things in an international environment.

11. **What has surprised you from the sector? Meaning: did you have any stereotype about the sector or your job experience has removed this feeling?**

When I started I thought that working in the IT was the same as being a programmer. I was surprise when I realized that this sector has a lot of different opportunities to offer: you can be a programmer, a consultant, a project manager and a lot of other very interesting roles.

12. **In your opinion, what are the most rewarding aspects of working in the ICT sector?**

I think the most interesting thing is the evolution of technology. If you work in this sector you have access to new things all the time, you see technologies changing and evolving and this is very interesting.

13. What are the main advantages for women in ICT sector compared to other industries or sectors?

I think the previous things I mentioned are the advantages of this sector but these are the same for men and for women.

14. How easy is for you to conciliate your personal and professional life?

This is the difficult part. In the ICT sector you have always to move forward. However it is different in the public sector were leaves are longer and pressure is lower. But you have to work long hours in ICT, especially if you work with machines because they can be down at any time, and you have to be there to solve the problem.

The support of your family is very important. For example, for me at this time it is very difficult as my family is not here yet, and this is hard In any case, if the family supports you then things become easier.

15. During your career, did you ever have the idea of giving up or exiting the ICT workforce? Why?

No. I like the ICT sector a lot. Of course, I don't like that much to be in front of a PC the whole day and do programming, I also like communicating and other areas of the work like, business analysis, project management, etc.

16. Why do you think women exit the ICT sector more often than men?

I think sometimes it is a problem of reconciliation with private life, but that happens in many sectors: women just decide to leave.

Recruitment

Now talking about your current organisation in particular…

17. Are women underrepresented in your organisation? And in your technical area?

We are not equal in the most technical positions, but it has strong equal opportunities policies. I think there are fewer women because of the profiles they look for: here we have to work even at night and, sometimes, women don't want that kind of jobs.

Management

18. In your opinion, what are the advantages for companies to count with women among its workforce? And in decision-making positions?

It is a question of personality. If there are women who can manage then they should be put in the right position. For me it is not a question of obligation: "women should be put in managerial positions",

they should just have the same opportunities to do this kind of jobs as men. However, I believe that women manage better; we are mothers and we also have to manage our family, this makes as to be able to work in a multi-tasking way! I think it is a question of having the chance, because women can be as good as men.

19. In what ways can women themselves contribute to improving the gender balance in top jobs?

I think it is the society that must change. Even now, women who want to work and apply for this type of jobs and make this kind of movement they are not supported. I am here alone, without my family and everybody think that this is not normal, that it should be the opposite. I think it is the traditional way of thinking about women and especially mothers.

Uptakes after leaves

20. Have you ever benefitted from maternity leave? Was it easy to keep update during the leave?

Yes, twice. The first time I was in the private sector working on an IT company and I only had three months but when I was in the public sector I was away for a year and a half. And in spite of being out so many moths it didn't take me long to catch up. It was not difficult because I like it and I have a supportive environment, my colleagues always advised me and we had a very good relationship.

Maturity

21. Would you participate in a campaign to promote women's inclusion in the ICT sector?

I wouldn't say no. I understand this is important so I am open to further discuss.

Inspiring others

22. Would you recommend girls to choose technical careers in the ICT sector? Why?

It is a very interesting sector with a lot of opportunities. ICT could be mixed with legal issues or communications, with many different chances and different types of jobs.

23. In your opinion what could be done to increase the participation of women in the sector?

I think they should launch proper campaigns to show how the ICT professions are: we have a lot of career paths, a lot of challenging and interesting environments to work.

Interview IX. Videogames developer/entrepreneur

1. What is your current position?

I am quite a managing director plus producer. Actually it is my own company; I founded it with two other partners. Firstly, we worked together at the University in an independent game developer collective we co-founded together, that was an artistic project without profits, and three years ago we decided to found an enterprise for trying luck commercially.

Education

2. What is your educational background?

I am specialized in game development technology. But today I don't do too much of what I studied, I do much more business. I made my bachelor in Media Technology and then I do a master in videogames development.

3. When did you decide to study media and ICT related topic? Why?

I grew up playing videogames in an environment in which games for boys and girls are equal, so I played a lot of games with my friends and myself. First I didn't think it would be my career, I didn't plan it, but after I got into interactive media bachelor the videogames studies became strong and there was a lot of good professors and lot of interesting subjects to take and that is when I decided to study a Master in game development.

I am from Macedonia and there it wouldn't have been possible to study this because the technical studies are very traditional, but I moved to Denmark and I realized that this is possible.

4. What kind of aptitudes do you think are more relevant to succeed in this case of studies? Who should study this?

You must have a combination of skills and talent. You must be good at this, being open, extrovert… And definitely you must have passion for the sector; it is not a thing that you do for the money.

5. Did you find any reticence in your environment to choose this sector? Did you receive the expected support from your family/teachers when you communicated your career decision?

Yes, I am from Macedonia and there it is considered that videogames are a male thing. But programming is considered to be an opportunity to have a good job and going to the electronic engineering University or informatics is acceptable both for girls and boys although there are definitely more boys than girls. So I didn't have the idea that going to game development or programming education is a very guy's thing.

When I started studying in Denmark there were very few girls (just a 10% or 20%) in my bachelor and for me it was a very natural thing to be in groups in which I was the only girl, and I didn't think about it. I only thought about it during a very short period of my life during which I thought that maybe it was too much being one of the few girls in the class, but over time I realized that developing makes you forgetting the environment and you become one more of the guys.

So for me it is not a big issue since because of my background and my family it was never a strange thing. Anyway, being in Denmark was a key factor for me finally becoming a game developer.

Career development

6. What are the main barriers you have had to overcome during your career? Which ones do you consider to be related to gender?

I definitely found some barriers for the fact of being a woman.

Regarding videogames, first of all, I believe there are some differences in the way we think. One of the things of my job that satisfy me the most is that our games are more gender neutral. That is one of the things in which I contribute because I have a lot to say about it.

On the other hand this is still a very male dominated industry and women have to proof they are good.

7. What has surprise you from the sector? Meaning: Did you have any stereotype about the sector or your job that experience has removed?

I didn't think so much about these things before I started. I didn't think at all that it would be harder because of being a girl. And I already said that in my country it is popular doing this kind of technical studies, even for girls.

But I have to say that when I started at University I noticed that guys assume that they are always in competition which each other, especially when there are few girls among them. And they often hurt girls because they try to prove how much they know and how much better they are. And that is a little bit intimidating and I thought: "wow, maybe I am not sufficient interested or passionate". But over time I realized that it was not true, it is just that boys are more competitive, and it doesn't mean that I don't have the same passion, it is just that we have a different way of expressing it. Guys are much more daring especially comparing with girls, who are less confident.

I had to learn who I am and how to adapt to this environment. And for me that was more challenging because besides being a female I was a foreigner too.

8. In your opinion, what are the most rewarding aspects of working in the ICT sector? And what are the main advantages for women in ICT sector compared to other industries or sectors?

It offers lots of things. One of the biggest rewards is that if you establish, if you really survive and get into the industry, you get a lot of credit as a woman right now, because it is sure that you have a very strong personality.

Being part of this industry is actually challenging in many levels. I achieve a big success because I am in it but I think for me it is different because I studied with this people (my co-founders) and they know me and I feel comfortable with them. But for any other women entering into this industry is very challenging and therefore they get a great credit when they get to establish.

Furthermore, I think it is an amazing industry because it mixes skills and it is international. There are people with different profiles and nationalities working in the industry so you can really grow as a person, and that is a point both for the girls and for the boys. I believe that it is a very interesting industry because of that. I think that being part of the industry right now makes you grow personally and professionally.

9. How easy is for you to conciliate your personal and professional life?

It's a very hard industry and it is very hard to balance things out. You have to grow all the time, it is all about going better and better, and that takes you long hours. You are challenged all the time.

10. During your career, did you ever have the idea of giving up or exiting the ICT workforce? Why?

No, never. There are so many things that I love of the industry that I will definitely never leave it. There are hard moments but I love the way we work… There are too many things that I like that I don't think about the bad things. When they happen I try to believe that being here is a good thing: I hope that I am changing something. That is another motivation: I really want to change the typical opinion about girls not being able to do game design or something like that.

11. Why do you think women leave the ICT sector more often than men?

I don't know. I don't have the experience of being in a big game company. We are ten people and I am the only girl but I am the owner so everybody treats me with respect, I mean I am in a very different position. Also the clients are very polite: there is no other one from me in the company who can do this successful.

It is true that I talk to other women who said that it is too hard: in this industry we work long hours and we don't have large payments and besides if you are not happy and you are stress…I don't know if that is a reason to leave the industry. But this could be the same for girls and guys, so I'm not really sure why women leave.

I really believe that the industry is very tough and I also think that there are personalities that can't handle it. Furthermore, in big game companies everything is different: the structure, the work…

Recruitment

Now talking about your company in particular…

12. In your opinion, what' the reason of the underrepresentation of women in your company?

We actually had some women in the team but they collaborate as freelance. Within the company technical positions are dominated by men, but we have had women in the past. Besides, most of the girls collaborate in the artist side, and we work with the artist part project to project since the requirements are different (freelances)…

Furthermore, we received very few CVs of girls when we have a vacancy.

13. Has your organisation promoted policies to increase women's presence in your company? If the answer is yes, what have those policies been?

I like girls contacting me for doing internships, or for asking questions about the company or some of our games. I appreciate that, but I will never hire a girl just for being a girl.

14. Have you ever designed any videogame specifically targeted for women? Do you think that there are significant differences when designing for women? What are they?

I actually think that it is the society that puts such ideas in our head during we are growing up. I have played with specific boy's games and girl's games and I equally liked them, and sometimes I liked more the boy's ones, what really matter is what kind of player you are.

But the fact is that people are trying to tempt you saying that they are differences between genders and they offer games for boys and for girls and they claim that they are having a big success because they do this. And it is also proved that (at least for what I see) people who talk of making girls games are normally from male dominated companies. They talked about what girls want and I think if that was the opposite way everybody thinks that it is strange. Especially if games for women are games in pink packages.

I am not academic but I have a very sound opinion of not segregating boy's and girl's games. I would like to change the industry in a way that the gender wasn't the only thing taking into account. I don't think it is wrong to have games targeted more for boys or for girls but I don't think we must put much importance on this factor.

15. Do you think the existence of specific videogames for women contribute to the further development of this sector? And to the presence of more ICT women designers/developers?

Definitely, more women will change the industry, but not by doing games for men and games for women, in a deeper sense. I keep on going to conferences and I often meet people who suppose that I am in marketing, they think "of course, you're not a game developer".

I think that better games or better products will come if you have different people in your team: different nationalities, gender, age, characters… Diversity will make the industry stronger.

16. Are there stereotypes that should be dismissed? How can this be done?

At the University I had to prove that I was technically better than boys to be considered good. There is a judgment, but here in Denmark it is not strong. Sometimes I had to stand jokes, and I know that it is a joke but at the same time it is not. But you have to put this behind you and with the time I learnt how to return this kind of comments. On the contrary this helps you understanding how immature these people are, I know that I'm judging them, but these are the kind of person I wouldn't hire. At the end, it is a question of confidence.

Management

17. In what ways can women themselves contribute to improve the gender balance in top jobs?

I think role models are important, like me owning this company. I hope this will be important for the future. I like talking to girls about the games or the work I do because I think it is very important. It is inspiring in a way.

Uptakes after leaves

18. Have you ever benefitted from maternity leave?

No, I haven't.

19. Do you think it is easy to keep update during the leave?

I think it would be easy for me because I have a very good relationship with my partners. I will be still part of the company and I will take decisions on the company. We are a good team and we understand each other so I am not afraid of doing such a move. I know it would be challenging but I think I will be fine.

To me it is key the fact that is a very changing industry, very ambitious and very challenging so I think it is important to stay in touch to be updated on what is going on in the company.

Maturity

20. Would you participate in a campaign to promote women's inclusion in the ICT sector?

Of course, I love participating in thinks like these. If I have the time I like doing it. I don't know much in an academic way but I like telling my story. I do believe that is something that we can do to attract more women to the sector and I would like to support any initiative like that.

Inspiring others

21. Why would you recommend girls to choose technical careers in the ICT sector?

One cool thing is that there are a lot of professions in the industry. It is a very challenging industry so if you are ambitious it is a good place.

Another important thing that can definitely encourage girls going into this sector is that girls have strong communications abilities for being the link of all this. It is a thing that we can do better, so we can help connecting the artistic and the technical areas that coexist in videogames. We can lead teams and have strong commercial roles.

Interview X. Digital Communications Strategy Responsible

1. What is your current position? What does your job consist of?

I am the Head of Digital Engagement at a NGO. I work in three areas mainly: first we translate the work in the office for trying to work in a more digital way, we also analyses how do digital in order to allow that all our strategy fixes together and finally we also do marketing: we have a team with different profiles.

Education

2. What is your educational background?

I studied visual arts plus computer science in UK.

3. What kind of aptitudes do you think are more relevant to succeed in this case of studies? Who should study this?

A blend of creativity and technical makes a good mix. Working in digital is not just about the technology, you need to be able to think and be creative.

4. Did your education and social environment influence this decision? Did any particular person have an impact on your decision? (Parents, teachers, a friend, a famous, etc.)

At the age of 10 my dad got me into programming and I had a big exposure to videogames through the shop my parents owned. My parents thought that the future was computers, so that definitely influenced me.

Career development

5. How has been your professional path until your current position? Tell us a bit about your previous working experience.

After finishing my degree I was elected students' union vice-president. After that I changed to working in a web project at the university before getting a job in a charity in London. But I have always wanted to work in the non-profit sector.

6. How did you end up in your organisation?

I was headhunted. I've been here two years now.

7. What are the main barriers you have had to overcome to reach your current position? Which ones do you consider to be related to gender?

The non-profit sector needs to be sure about to spend money wisely. This means newer things like digital can go slower at first but I don't think this is related to me being a woman.

In the past I've sometimes had to deal with individuals that thought as a woman I wouldn't have technical knowledge. I just decided to use that to my benefit when I spotted it.

8. **In your opinion, what are the most rewarding aspects of your job in the ICT sector?**

   I would say problem solving. Finding a solution in a collaborative way is very rewarding.

9. **How satisfied are you with your current position and work in the industry? What are the main advantages for women compared to other industries or sectors?**

   It is a difficult question. In the charity sector females are predominant. But I do come across a more masculine dominance in the technical industry too.

   Whatever your gender, the digital industry and the non-profit sector provide a challenging and interesting workplace where you can feel rewarded by creating something tangible and help the work be a better place.

10. **What has surprised you from the sector? Meaning: did you have any stereotype about the sector or your job that experience has removed?**

    Having studied computer science - I knew that people who work with technology can be creative people. Some people might call some of the industry geeks but that doesn't mean they aren't fun and interesting.

11. **How easy is for you to conciliate your personal and professional life?**

    The fact is that I don't see them completely different. In my free time I also spend a lot of time in the social media.

12. **During your career, did you ever have the idea of giving up or exiting the ICT workforce? Why?**

    No, I have never thought in leaving.

13. **Why do you think women exit the ICT sector more often than men?**

    Also I'm not sure enough organisations view ICT functions and their staff as strategic and wouldn't consider them for board level roles. So if you want to become more advanced in your career there is greater opportunity to be strategic in different functions. Maybe that's why?

<u>Recruitment</u>

14. **Are women underrepresented in your unit? And in the technical area?**

In my organisation there are more women since it is the non-profit sector but in the top positions there are still more men than women. In my unit we are about balanced, but you can say that comparing with the rest of the organisation there are more men.

15. Has your organisation launched policies to promote women within your area? If the answer is yes, which ones?

There are not gender specific measures. There are career programs but they are for everybody who want to use them.

Management

16. In your opinion, what are the advantages for companies to count with women among its workforce? And in decision-making positions?

I think it's always an advantage to have different characteristics in a team. Women often bring a different perspective. I just think that diversity makes best decisions emerge.

Uptakes after leaves

17. **Have you ever benefitted from maternity leave?**

No, I haven't.

18. If you ever decided to be a mother, how will that influence your career?

Here normally women who take maternity leaves come back. Obviously it changes your priorities.

Inspiring others

19. Would you recommend girls to choose a career in the ICT sector? Why?

I tell them that it can be fun and creative. There are good opportunities if you take the chance. It can also be inspiring.

20. In your opinion what could be done to increase the participation of women in the sector?

I think technology should be taught in schools and to help you decide if you enjoy it or not. And from the industry I think they can be more transparent about what is involved and showcase the diversity of people working in the area.

General conclusions

Some general ideas can be gathered from the interviews. The first one is that the ICT sector is challenging and changing, that means that people in it have to update their knowledge on the issue all the time. This idea has been highlighted for all women interviewed always in a positive way. Most of them have also taken down the stereotype about the sector, saying that it is very communicative, international and full of different possibilities, some of them very creative. The idea is technology enables all things in our lives. Furthermore, some of them have spoken about the reward that you get when you solve a problem or make things that works.

The second idea that it is also present in all the speeches is the importance of having diverse teams in companies, in order to increase the point of views about the problems and provide better solutions to them.

Other idea that has also appeared during some of the interviews is the importance of self-confidence. On this regard, there is the general idea that boys are more confident in their own capabilities than girls and in this sense they are more daring. Comparing themselves with boys another recurring idea is that, in some moments, they have had to prove that they are technically competent. The younger interviewees have also pointed out the importance of having specific studies related to the sector to make the access to an ICT career easier.

Talking about their working conditions all of them have set out the advantages and disadvantages of working in the sector. Among the first ones, all of them agree in the flexibility of the sector: teleworking, flexible schedules. On the other hand, they highlighted the long working hours and the importance of keeping up-to-date in order to not leave the sector, above all during maternity leave. Taking into account this conditions most of them has talked about the importance of having a supportive environment.

ANNEX VIII. INFORMATION GATHERED FROM RECRUITMENT COMPANIES

Methodology

The gathering of information on women in ICT from recruitment companies was one aspect of this study. The objective was to see to what extent gender is part of the recruitment companies' interests and to identify what kind of gender data on employment in the ICT sector they keep and what kind of gender analysis they carry out.

To achieve this task, a questionnaire with 15 closed questions was designed and tested through two interviews conducted by call conference, one to an online recruiting service and one to a recruiting company specialized in IT professionals.

Questions focused on women's participation in the labour market in the ICT sector, salaries, and hiring companies' preferences and attitudes regarding gender.

Recruiting companies were selected on the basis of the geographical scope and area of activity with the following order of preference:

1. ICT specialized companies working at the European level.
2. General recruiting companies (all sectors) with strong activity in the ICT sector, working at the European level.
3. National recruiting companies specialised in the ICT sector.

A first batch of companies was contacted but due to the lack of responses received it was necessary to make other two further rounds of contact. Reminders were periodically sent to all companies contacted.

The final questionnaire was sent via email to 38 recruiting companies in Europe, including general recruiting companies and recruiting companies specialized in ICT. Among these 38 companies 4 sent the survey completed, 4 answered saying that they haven't data classified by sex and 30 did not answer at all.

Questions sent to Recruitment companies

1. Which percentage of job offers represents the ICT sector for your company?
    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%
2. Which percentage of hiring enterprises comes from the ICT sector?
    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%
3. Which are the most demanded profiles by the ICT companies?
    a. Managers
    b. Professionals
    c. Technicians and associate professionals
    d. Support workers
    e. Service and sales workers
    f. Manual workers
    g. Other
4. Which level of studies is the most demanded by the ICT companies?
    a. Pre-primary and primary education
    b. Lower secondary or second stage of basic education
    c. Upper secondary and post-secondary non-tertiary education
    d. Tertiary education
    e. Second stage of tertiary education leading to an advanced research qualification
5. Is it demanded an ICT education for the ICT companies?
    a. Yes
    b. No
    c. It depends on the position
6. From total applicants to ICT position, what percentage do women represent?
    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%
7. What is the most common level of studies of women who apply to ICT positions?
    a. Pre-primary and primary education
    b. Lower secondary or second stage of basic education
    c. Upper secondary and post-secondary non-tertiary education

d. Tertiary education
e. Second stage of tertiary education leading to an advanced research qualification

8. From total applicants hired in ICT positions, what percentage do women represent?

a. 0%-25%
b. 25%-50%
c. 50%-75%
d. 75%-100%

9. Which are the average yearly net revenues for a man working in the ICT sector?

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Technicians and associate professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

10. Which are the average yearly net revenues for a woman working in the ICT sector? (if different from above)

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Technicians and associate professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Support	6.000€-	18.000€-	30.000€-	45.000€	Over

workers	18.000€	30.000€	45.000€	-80.000€	80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
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Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

11. From your experience, what do you think that are the main motivations for women for choosing a job?
    a. Possibility of promotion
    b. Personal and professional fulfilment
    c. Salary
    d. Flexible timetable
    e. Good balance of professional and personal life
    f. Others (Open answer)
12. What do you think are the main barriers for women for choosing an ICT career?
    a. Lack of role models for women in the sector
    b. Perception of the job as irrelevant or boring
    c. Lack of corporate commitment to the promotion of women in ICT companies
    d. Perception of the sector as male dominant
    e. Lack of knowledge of the type of work that can be performed
    f. Perception of the sector as difficult to reconcile family and work
    g. Others (Open answer)
13. Have you ever had the perception that an ICT company takes into account the gender for choosing its employees?
    a. Yes, sometimes
    b. Yes, often
    c. No, never
14. IF YES, Do you think that gender discrimination is more frequent in the ICT sector than in other sectors?
    a. Yes
    b. No
15. What do you think are the main barriers for settling women in the ICT sector?
    a. Lack of women with ICT formation
    b. Lack of interest of the ICT companies
    c. Persistence of traditional roles
    d. Lack of information about the women available for ICT vacancies

e. Others (Open Answer)

General conclusions

The low number of responses does not allow drawing any relevant conclusions, since conclusions do not have enough statistical relevance.

However, generally speaking, the main conclusion is that recruiting companies in Europe do not gather information segregated by gender.

In addition, from received responses, two ideas can be highlighted:

- First is that the number of women applying to ICT jobs is generally below 25% and that there are not enough female candidates for these positions.
- Second, recruiting companies have pointed out balancing of professional and personal life and personal fulfilment as the perceived main motivation for women when choosing a job.

Answers[146]

Answer 1:

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    b. 25%-50%
    c. 50%-75%
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    d. Support workers
    e. Service and sales workers
    f. Manual workers
    g. Other
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5. Is it demanded an ICT education for the ICT companies?
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    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%
7. What is the most common level of studies of women who apply to ICT positions?

[146] Answers marked in grey.

a. Pre-primary and primary education
b. Lower secondary or second stage of basic education
c. Upper secondary and post-secondary non-tertiary education
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Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

10. Which are the average yearly net revenues for a woman working in the ICT sector? (if different from above) – As above.

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Technicians and associate	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

professionals					
Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

11. From your experience, what do you think that are the main motivations for women for choosing a job?

    a. Possibility of promotion
    b. Personal and professional fulfilment
    c. Salary
    d. Flexible timetable
    e. Good conciliation of professional and personal life
    f. Others (Open answer)

12. What do you think are the main barriers for women for choosing an ICT career?

    a. Lack of role models for women in the sector
    b. Perception of the job as irrelevant or boring
    c. Lack of corporate commitment to the promotion of women in ICT companies
    d. Perception of the sector as male dominant
    e. Lack of knowledge of the type of work that can be performed
    f. Perception of the sector as difficult for family and work conciliation
    g. Others (Open answer)

13. Have you ever had the perception that an ICT company takes into account the gender for choosing its employees?

    a. Yes, sometimes
    b. Yes, often
    c. No, never

14. IF YES, Do you think that gender discrimination is more frequent in the ICT sector than in other sectors?

    a. Yes
    b. No

15. What do you think are the main barriers for settling women in the ICT sector?

    a. Lack of women with ICT formation

b. Lack of interest of the ICT companies
c. Persistence of traditional roles
d. Lack of information about the women available for ICT vacancies
e. Others (Open Answer)

Answer 2:

1. Which percentage of job offers represents the ICT sector for your company?
   a. 0%-25%
   b. 25%-50%
   c. 50%-75%
   d. 75%-100%
2. Which percentage of hiring enterprises comes from the ICT sector?
   a. 0%-25%
   b. 25%-50%
   c. 50%-75%
   d. 75%-100%
3. Which are the most demanded profiles by the ICT companies?
   a. Managers
   b. Professionals
   c. Technicians and associate professionals
   d. Support workers
   e. Service and sales workers
   f. Manual workers
   g. Other
4. Which level of studies is the most demanded by the ICT companies?
   a. Pre-primary and primary education
   b. Lower secondary or second stage of basic education
   c. Upper secondary and post-secondary non-tertiary education
   d. Tertiary education
   e. Second stage of tertiary education leading to an advanced research qualification
5. Is it demanded an ICT education for the ICT companies?
   a. Yes
   b. No
   c. It depends on the position
6. From total applicants to ICT position, what percentage do women represent?
   a. 0%-25%
   b. 25%-50%
   c. 50%-75%
   d. 75%-100%

7. What is the most common level of studies of women who apply to ICT positions?

    a. Pre-primary and primary education
    b. Lower secondary or second stage of basic education
    c. Upper secondary and post-secondary non-tertiary education
    d. Tertiary education
    e. Second stage of tertiary education leading to an advanced research qualification

8. From total applicants hired in ICT positions, what percentage do women represent?

    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%

9. Which are the average yearly net revenues for a man working in the ICT sector?

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Technicians and associate professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

10. Which are the average yearly net revenues for a woman working in the ICT sector? (if different from above)

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

Technicians and associate professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

11. From your experience, what do you think that are the main motivations for women for choosing a job?
    a. Possibility of promotion
    b. Personal and professional fulfilment
    c. Salary
    d. Flexible timetable
    e. Good conciliation of professional and personal life
    f. Others (Open answer)
12. What do you think are the main barriers for women for choosing an ICT career?
    a. Lack of role models for women in the sector
    b. Perception of the job as irrelevant or boring
    c. Lack of corporate commitment to the promotion of women in ICT companies
    d. Perception of the sector as male dominant
    e. Lack of knowledge of the type of work that can be performed
    f. Perception of the sector as difficult for family and work conciliation
    g. Others (Open answer)
13. Have you ever had the perception that an ICT company takes into account the gender for choosing its employees?
    a. Yes, sometimes
    b. Yes, often
    c. No, never
14. IF YES, Do you think that gender discrimination is more frequent in the ICT sector than in other sectors?
    a. Yes
    b. No

15. What do you think are the main barriers for settling women in the ICT sector?

    a. Lack of women with ICT formation
    b. Lack of interest of the ICT companies
    c. Persistence of traditional roles
    d. Lack of information about the women available for ICT vacancies
    e. Others (Open Answer)

Answer 3:

1. Which percentage of job offers represents the ICT sector for your company?

    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%

2. Which percentage of hiring enterprises comes from the ICT sector?

    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%

3. Which are the most demanded profiles by the ICT companies?

    a. Managers
    b. Professionals
    c. Technicians and associate professionals
    d. Support workers
    e. Service and sales workers
    f. Manual workers
    g. Other

4. Which level of studies is the most demanded by the ICT companies?

    a. Pre-primary and primary education
    b. Lower secondary or second stage of basic education
    c. Upper secondary and post-secondary non-tertiary education
    d. Tertiary education
    e. Third cycle of tertiary education leading to an a PhD

5. Is it demanded an ICT education for the ICT companies?

    a. Yes
    b. No
    c. It depends on the position

6. From total applicants to ICT position, what percentage do women represent?

    a. 0%-25%

b. 25%-50%
c. 50%-75%
d. 75%-100%

7. What is the most common level of studies of women who apply to ICT positions?

   a. Pre-primary and primary education
   b. Lower secondary or second stage of basic education
   c. Upper secondary and post-secondary non-tertiary education
   d. Tertiary education
   e. Second stage of tertiary education leading to an advanced research qualification

8. From total applicants hired in ICT positions, what percentage do women represent?

   a. 0%-25%
   b. 25%-50%
   c. 50%-75%
   d. 75%-100%

9. Which are the average yearly net revenues for a man working in the ICT sector?

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Technicians and associate professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

10. Which are the average yearly net revenues for a woman working in the ICT sector? (if different from above)

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Technicians and associate professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

11. From your experience, what do you think that are the main motivations for women for choosing a job?

    a. Possibility of promotion
    b. Personal and professional fulfilment
    c. Salary
    d. Flexible timetable
    e. Good conciliation of professional and personal life
    f. Others (Open answer)

12. What do you think are the main barriers for women for choosing an ICT career?

    a. Lack of role models for women in the sector
    b. Perception of the job as irrelevant or boring
    c. Lack of corporate commitment to the promotion of women in ICT companies
    d. Perception of the sector as male dominant
    e. Lack of knowledge of the type of work that can be performed
    f. Perception of the sector as difficult for family and work conciliation
    g. Others (Open answer)

13. Have you ever had the perception that an ICT company takes into account the gender for choosing its employees?

a. Yes, sometimes
b. Yes, often
c. No, never

14. IF YES, Do you think that gender discrimination is more frequent in the ICT sector than in other sectors?

    a. Yes
    b. No

15. What do you think are the main barriers for settling women in the ICT sector?

    a. Lack of women with ICT formation
    b. Lack of interest of the ICT companies
    c. Persistence of traditional roles
    d. Lack of information about the women available for ICT vacancies
    e. Others (Open Answer)

Answer 4:

1. Which percentage of job offers represents the ICT sector for your company?

    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%

2. Which percentage of hiring enterprises comes from the ICT sector?

    a. 0%-25%
    b. 25%-50%
    c. 50%-75%
    d. 75%-100%

3. Which are the most demanded profiles by the ICT companies?

    a. Managers
    b. Professionals
    c. Technicians and associate professionals
    d. Support workers
    e. Service and sales workers
    f. Manual workers
    g. Other

4. Which level of studies is the most demanded by the ICT companies?

    a. Pre-primary and primary education
    b. Lower secondary or second stage of basic education
    c. Upper secondary and post-secondary non-tertiary education
    d. Tertiary education
    e. Second stage of tertiary education leading to an advanced research qualification

5. Is it demanded an ICT education for the ICT companies?

   a. Yes
   b. No
   c. It depends on the position

6. From total applicants to ICT position, what percentage do women represent?

   a. 0%-25%
   b. 25%-50%
   c. 50%-75%
   d. 75%-100%

7. What is the most common level of studies of women who apply to ICT positions?

   a. Pre-primary and primary education
   b. Lower secondary or second stage of basic education
   c. Upper secondary and post-secondary non-tertiary education
   d. Tertiary education
   e. Second stage of tertiary education leading to an advanced research qualification

8. From total applicants hired in ICT positions, what percentage do women represent?

   a. 0%-25%
   b. 25%-50%
   c. 50%-75%
   d. 75%-100%

9. Which are the average yearly net revenues for a man working in the ICT sector?

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Technicians and associate professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

10. Which are the average yearly net revenues for a woman working in the ICT sector? (if different from above)

Managers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000	Over 80.000€
Professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Technicians and associate professionals	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Support workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Service and sales workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Manual workers	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€
Other	6.000€-18.000€	18.000€-30.000€	30.000€-45.000€	45.000€-80.000€	Over 80.000€

11. From your experience, what do you think that are the main motivations for women for choosing a job?

    a. Possibility of promotion
    b. Personal and professional fulfilment
    c. Salary
    d. Flexible timetable
    e. Good conciliation of professional and personal life
    f. Others (Open answer)

12. What do you think are the main barriers for women for choosing an ICT career?

    a. Lack of role models for women in the sector
    b. Perception of the job as irrelevant or boring
    c. Lack of corporate commitment to the promotion of women in ICT companies
    d. Perception of the sector as male dominant
    e. Lack of knowledge of the type of work that can be performed
    f. Perception of the sector as difficult for family and work conciliation
    g. Others (Open answer)

13. Have you ever had the perception that an ICT company takes into account the gender for choosing its employees?

    a. Yes, sometimes
    b. Yes, often
    c. No, never

14. IF YES, Do you think that gender discrimination is more frequent in the ICT sector than in other sectors?

    a. Yes
    b. No

15. What do you think are the main barriers for settling women in the ICT sector?

    a. Lack of women with ICT formation
    b. Lack of interest of the ICT companies
    c. Persistence of traditional roles
    d. Lack of information about the women available for ICT vacancies
    e. Others (Open Answer)

ANNEX IX. INFORMATION GATHERED FROM ASSOCIATIONS

Methodology

As a way to obtain relevant information on the issue, surveys were sent to entrepreneurs, women in ICT and women in management associations.

The objective was to ask business associations and women's associations, as great connoisseurs of the reality of the sector, about the presence of women in the sector, barriers and drivers for their participation and the reality of entrepreneurship in Europe from a gender perspective.

A different survey was designed for each category of association (3) with the aim of gathering as much information on Women and ICT in Europe from their perspective. Questionnaires included a maximum of six open questions to limit the time needed for answering and to allow for the maximum number of responses. Questionnaires were sent and received via email.

Associations were selected on the basis of their objectives and their transnational character. All associations included in the survey operate at the European level and are devoted to the defence of the interest of women in the ICT sector, professional women and entrepreneurs (both general and female entrepreneurs).

A first batch of companies was contacted but due to the lack of responses received it was necessary to increase the number of associations contacted trough two further rounds of contacts. Furthermore, all the associations were sent a reminder three weeks after the first delivery. Finally 17 associations were contacted, including 9 women in ICT associations, 5 entrepreneurship associations and 3 women in management associations, but only 4 returned the survey completed.

Questions sent to Women in ICT associations

1. Could you tell us what are the main objectives of your Association?
2. Which activities, in short, do you develop to reach these objectives?
3. According to your experience, what are the reasons and barriers which keep women out of the ICT sector?
4. Regarding women in managing positions, what particular barriers do you think prevent women from accessing managerial positions?
5. In your opinion, what could be done to increase participation of women in the sector:
    a) From governments and public institutions?
    b) From companies from the sector?
    c) From the society?
6. Does your association have gender statistics on ICT sector? (If yes, are they available for public or for this assessment)

Questions sent to Entrepreneurship associations

1. Could you tell us what are the main objectives of your Association?
2. Which activities do you develop to reach these objectives?
3. According to your experience, what are the reasons and barriers which keep women out of entrepreneurship?
4. In your opinion, what could be done to increase entrepreneurship among women:
    a) From governments and public institutions?
    b) From companies from the sector?
    c) From the society?
5. Does your association have gender statistics on entrepreneurship? And on entrepreneurship in the ICT sector? (If yes, are they available for public or for this assessment)

Questions sent to women in management associations

1. Could you tell us what are the main objectives of your Association?
2. Which activities, in short, do you develop to reach these objectives?
3. According to your experience, what are the main reasons that prevent form accessing management positions?
4. In your opinion, what could be done to increase the number of women in management positions:
    a) From governments and public institutions?
    b) From companies from the sector?

c) From the society?

5. Does your association have gender statistics on women in management? And on management in the ICT sector? (If yes, are they available for public or for this assessment)

General conclusions

A total of 18 associations were contacted, but the low number of responses (4) does not allow the drawing of general conclusions.

From the information gathered it can be summarized that most of the associations in the field of women and ICT work mainly on aware-raising issues, as well as networking. They consider that the most effective measures to reduce the gap of women in the sector are the ones that provide visibility to women (role models and awareness-raising campaigns) and the ones empowering women (improving their capabilities and their self-confidence).

None of the associations contacted have their own statistics or data and they mainly work with secondary data sources from existing studies and reports.

There is untapped data-gathering potential in the work of these associations, and coordinated activity in this field would have a great impact. Improving visibility and harnessing the existing synergies between the activities of the various associations (including sharing data and information, and making these data public) could result in an important increase in effectiveness and efficiency.

The European Commission should facilitate contacts and exchanges between associations and take advantage of the existing initiatives, avoiding duplication and optimizing resources.

Answers

Answer 1: Women in ICT Association

1. Could you tell us what are the main objectives of your Association?
    - Our mission is to promote the image of computing within Europe.
    - We strive to raise awareness of the importance of women being in the computing profession.
    - Make women aware of career options in computing.
    - Promote new ways of facing the challenges of the next generation of women in computing.
    - Establish partnerships with similar existing organisations in Europe for appropriate activities.
    - Increase participation of women in senior level positions.
    - Provide a platform for sharing resources, ideas and experiences.
    - Work with the EU and the European Commission on programmes related women in computing.
2. Which activities, in short, do you develop to reach these objectives?
    - We develop and publish interviews of successful women in computer science.
    - We organise conferences and events which assist women in computer science.
    - Mentoring and networking are key areas where we assist students and academia for better communication and role modelling.
    - We promote role models through conferences and videos which talk about being a woman working in an ICT role.
3. According to your experience, what are the reasons and barriers which keep women out of the ICT sector?
    - Culture teaches women that computer science is a field for men. Women feel that their contributions are not valued and therefore they are continually trying to improve their contribution.
    - Sometimes women are faced with discrimination or harassment which causes many to leave the field.
    - There are not appropriate mentoring schemes in institutions for women. Since there is a perception that women are less capable in engineering and science-oriented fields, typically, men are mentored and pushed to make progress in their careers.
    - As society has different prejudices and expectations how women should behave, they hardly can be mentored by men or really learn from them. Women need to be aware of their strength and overcome the obstacles.
    - Often women also struggle with lack of self-confidence or insufficient self-marketing.

4. Regarding women in managing positions, what particular barriers do you think prevent women from accessing managerial positions?

    - In Europe and around the world, women do not have role models which allow them to see themselves in the management positions.
    - Additionally, women as a minority in the field in industry feel isolated without role models and can become discouraged, many leave the field in order to advance faster.
    - The issues discussed in question 3 can create barriers that prevent women from being recognized as leaders.
    - Women who are the minority in organisations related with computing, usually do not ask for a raise, a better position and do not volunteer for a management position.

5. In your opinion, what could be done to increase participation of women in the sector:

    a) From governments and public institutions?

    - More role models and monetary support in developing these role models.
    - Marketing and campaigns.

    b) From companies from the sector?

    - Programs to get more women into leadership roles as well as into management and senior positions.
    - Success stories.

    c) From the society?

    - More publicity campaigns for the general public in which more female faces appear, for example: in science festivals/fairs, science museum exhibitions, radio and TV programmes. It is a manner to educate society, to start making it natural that women are involved in computer science and engineering in general.

6. Does your association have gender statistics on ICT sector? (If yes, are they available for public or for this assessment)

    We do not have any statistics at this time.

<u>Answer 2: Women in ICT Association</u>

1. Could you tell us what are the main objectives of your Association?

    - To increase the number of girls and women studying SET subjects and to help them progress to related careers.
    - To develop women's technical and entrepreneurial skills through training initiatives and projects.
    - To create information exchanges and networking opportunities for women in SET.

- To promote and support research into areas relating to women in SET.
- To support initiatives to promote the Gender Mainstreaming Policy.
- To promote regional, national and international awareness and interest in this field.

2. Which activities, in short, do you develop to reach these objectives?

   Promotion of our country-members network, dissemination of activities and studies, dissemination of a newsletter where our members publish their articles. Plus, we participate in European projects that give us the opportunity to carry out some actions and materials/tools that can help us to promote our objectives.

3. According to your experience, what are the reasons and barriers which keep women out of the ICT sector?

   It's been years since our association is working to study these barriers that it is clear they are focused in social roles, prototypes, culture and education. The capacity of women to assume ICT sectors has never called into question.

4. Regarding women in managing positions, what particular barriers do you think prevent women from accessing managerial positions?

   It is assumed that these barriers become a possibility to fit together both lives, the one that belongs to the private sector and the other that is related to the public and labour responsibilities. We need to keep in mind that informal networks promote that men hire other men.

5. In your opinion, what could be done to increase participation of women in the sector:

   a) From governments and public institutions?

      Positive discrimination could give an important impulse to increase participation.

   b) From companies from the sector?

      Policies for better distribution of working time that could help women and men in their positions.

   c) From the society?

      Give visibility positive models that give equal opportunities between women and men, which empower female values.

6. Does your association have gender statistics on ICT sector? (If yes, are they available for public or for this assessment)

   Yes, we have statistics that are most extracted from studies and projects. At this moment they are not public documents.

Answer 3: Entrepreneurship Associations

1. Could you tell us what are the main objectives of your Association?

   It is a worldwide, leading organisation searching, selecting and supporting innovative, leading and system changing social entrepreneurs.

2. Which activities do you develop to reach these objectives?

   We search, interview and select and spread the vision of "Everyone a Changemaker" which is the organisation's main philosophy.

3. According to your experience, what are the reasons and barriers which keep women out of entrepreneurship?

   Often they do not believe in themselves and often choose a safe job taking into consideration their role of being a Mom.

4. In your opinion, what could be done to increase entrepreneurship among women:

   a) From governments and public institutions?

      More openness with businesses and the civil sector.

   b) From companies from the sector?

      Offering creative possibilities for making women contribute (grants, applications, calls for proposals).

   c) From the society?

      Sharing more good examples and based on that, encourage women to take steps.

5. Does your association have gender statistics on entrepreneurship? And on entrepreneurship in the ICT sector? (If yes, are they available for public or for this assessment)

   No, we do not have that statistics available for public.

Answer 4: Women in Management Association

1. Could you tell us what are the main objectives of your Association?

Our focus is on women at the workplace and on women in leadership, power and decision making roles.

Our main objectives are:

- Achieve workplace equality.
- Equal pay for equal work.
- More women on boards and in decision making.
- Bring the voice of women to business.
- Achieve equal opportunities and status for women in the economic, civil and political life.

- To develop and spread our principles.

2. Which activities, in short, do you develop to reach these objectives?

   We are offering different activities at local, national or international level.

   Local:

   - Regular monthly events with speakers about topics related to our goals.
   - Actions on Equal Pay Day.
   - Mentoring.
   - Different programs like Personal Empowerment Program, Keys to Achievement and Success teams.

   National and international

   - National and international conferences and congresses.
   - International campaigns:
     - Equal Pay Day awareness campaign.
     - Women's Empowerment Principles.
     - Women Entrepreneurs & Trade.
   - Webinars.
   - Newsletters.
   - Public relations activities in newspapers, magazines and TV.
   - We are present on Facebook, Twitter and on major social networks.

   Individually – our members:

   - Take professional responsibility on all levels in economy, politics and society.
   - Think and acts locally, nationally and internationally.
   - Practice networking, mentoring and lobbying.
   - Enjoy lifelong learning.
   - Work with United Nations agencies and other international organisations.
   - Develop friendship.

3. According to your experience, what are the main reasons that prevent form accessing management positions?

   - Long lasting believes and stereotypes that mothers have to care about children and men go to work and are the main breadwinners.
   - Typical stereotypes that management in economy is a male domain.
   - Difficulties for women to reconcile work and family.
   - Shortage in many Countries, services for early childhood according to the objectives established by the European Commission with the Lisbon Strategy. An increase of these structures in all European countries would work as a driving force for female employment.

- Lack of reintegration programs of the new mothers both in public and in private companies.
- Lack of laws on the distribution of parental leave between both parents.
- Lack of education on gender equality, on the part of employers.
- Lack of cultural renewal - especially among young people - on gender equality.

4. In your opinion, what could be done to increase the number of women in management positions:

   a) From governments and public institutions?

   - To enact laws to eliminate the existing deficiencies.

   b) From companies from the sector?

   - To train man to think differently about women careers and their strengths for management positions.
   - To create a family friendly environment for mothers and fathers.
   - To offer childcare.

   c) From the society?

   - To develop and spread a different and conscious culture on gender equality.
   - To eliminate stereotypes about women and career in our minds.

5. Does your association have gender statistics on women in management? And on management in the ICT sector? (If yes, are they available for public or for this assessment)

   We do not have statistics on women in management or in the ICT sector.

ANNEX X. WOMEN IN ICT INDICATORS AND DATA SOURCES

This section gathers the main indicators about the situation of European women in ICT and their sources. Indicators are presented in four categories: Education, Employment, Working Conditions, R&D and Other relevant indicators (including indicators such as e-skills or leadership). A final category called "Uncompleted data" compiles data sources where important data gaps have been identified.

Each table includes, for each indicator, the source, information about the first year of the series, the last one, their regularity and countries and categories included.

Education and training

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (from the EU)	Categories	Notes
Tertiary by field of education and sex	EUROSTAT - Education statistics (educ_enrl5)	1998	2011	Yearly	EU27	Field of education: ISC Level of education: ISCED97	There are barely any data from Luxemburg. Data for France starts in 2006, Greece in 2002.
Doctorate students in science and technology fields by sex	EUROSTAT - Education statistics	1999	2010	Yearly	EU27	Level of education: ISCED97 Fields of education: ISC	There is no data from either Germany or the Netherlands. Italy has not updated since 2007.
Graduates in by field of education and sex	EUROSTAT - Education statistics (educ_grad5)	1998	2011	Yearly	EU27	Field of education: ISC[i] Level of education : ISCED97	Uncompleted data by countries depending on variable ISCDE97 selected, first in UK, Spain, Cyprus, France, Denmark and Greece.

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (from the EU)	Categories	Notes
Annual data graduation from tertiary education by sex	EUROSTAT - Human Resources in Science and Technology (HRST) (hrst_fl_tegrad)	1998	2010	Yearly	EU27	Fields of education: ISC[iv] Level of education: ISCED97	There is little data from Luxemburg and Greece.
Annual data on participation in tertiary education by sex	EUROSTAT - Human Resources in Science and Technology (HRST) (hrst_fl_tepart)	1998	2011	Yearly	EU27	Fields of education: ISC[iv] Level of education: ISCED97[iii]	There is little data from Luxemburg France data start in 2006 and Greece ones in 2002.
Tertiary graduates by field of education by sex	OECD - Data collection on education statistics	1998	2010	Yearly	EU27 except Latvia, Lithuania, Romania, Bulgaria, Malta and Cyprus	Field of education: ISC[i]	Depending on the field there is uncompleted data in some countries.
Proportion of boys and girls planning a career in engineering or computing	OECD - PISA	2006	2012		EU27 except Cyprus and Malta		There is only data for 2006 and 2012.
Gender differences in science performance	OECD – PISA	2000	2012	Every three years	EU27 except Cyprus		Data from Slovenia, Estonia, Lithuania and Romania starts in 2006. Malta only has data from 2010. Data from 2012 hasn't been published yet.

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (from the EU)	Categories	Notes
Gender differences in mathematics performance	OECD - PISA	2000	2012	Every three years	EU27 except Cyprus		Data from Slovenia, Estonia, Lithuania and Romania starts in 2006. Malta only has data from 2011. Data from 2012 hasn't been published yet.
Female tertiary graduates as percentage of all graduates in engineering, manufacturing and construction	UNESCO	1998	2011	Yearly	EU27 except Luxemburg		Data for Poland starts in 2005. There is some uncompleted data depending on the year and the country.
Female tertiary graduates as percentage of all graduates in science	UNESCO	1998	2011	Yearly	EU27		Luxemburg only has data from 2005. Polish data starts in 2005 and Greek ones in 2004. There is other uncompleted data depending on the year and the country.
Female tertiary enrolment in science	UNESCO	1999	2010	Yearly	EU27		Data for France starts in 2006. Germany only has data from 2000 to 2003 and Ireland and Luxemburg from 2008 to 2010. Italy doesn't update since 2007.

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (from the EU)	Categories	Notes
Female tertiary enrolment in engineering, manufacturing and construction	UNESCO	1999	2010	Yearly	EU27		Data for France starts in 2006. Germany only has data from 2000 to 2003 and Ireland and Luxemburg from 2008 to 2010. Italy doesn't update since 2008.

Employment

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
Annual data on HRST and sub-groups, employed, by sector of economic activity and sex	EUROSTAT - Human Resources in Science and Technology (HRST) (hrst_st_nsecsex2)	2008	2011	Yearly	EU27	Category: subgroups Economic activity: NACE Rev.2	
Annual data on HRST with tertiary education, by field of education and sex	EUROSTAT - Human Resources in Science and Technology (HRST) (hrst_st_nfiesex)	2003	2011	Yearly	EU27 except Malta	Category: Fields of education: ISC[iv]	
Annual data on HRST and non-HRST, unemployed, by	EUROSTAT - Human Resources in Science and Technology	1994	2011	Yearly	EU27 except Malta	Category:	

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
sex	(HRST) (hrst_st_nunesex)						
Annual data on employment in technology and knowledge-intensive sectors at the national level, by sex	EUROSTAT - Statistics on high-tech industry and knowledge-intensive services (htec_emp_nat2)	2008	2011	Yearly	EU27	Economy activity: NACE Rev.2	
Annual data on job vacancy statistics by occupation	EUROSTAT- Labour Force Survey (jvs_a_nace2)	2008	2011	Yearly	EU27 except Malta, Spain, Italy and Austria	Economic activity: NACE Rev. 2 Occupation: ISCO08	There is previous data but they are classified under NACE Rev.1 (2000-2008). The LFS was set up in 1983 but there aren't data on the Internet before 1998.
Employment by sex, age and detailed economic activity	EUROSTAT: Labour Force Survey (lfsq_egan22d)	2008	2012	four-monthly	EU27		There is little data depending on the country and on the economic activity selected. There is previous data classified under NACE Rev.1 (2000-2008). The LFS was set up in 1983 but there isn't data on

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
							the Internet before 1998.
Employees by flexibility of their working schedule and economic activity by sex	EUROSTAT: Labour Force Survey (lfso_10fvareco)	2010			EU27	Economic activity: NACE Rev. 2	There is only data from 2010.
Self-employment by sex, age and economic activity	EUROSTAT: Labour Force Survey (lfsq_esgan2)	2008	2012	four-monthly	EU27	Economic activity: NACE Rev. 2[xiv]	There is uncompleted data depending on the country and on the economic activity selected. There is data between 1998 and 2008 but is classified under NACE Rev. 1. The LFS was set up in 1983 but there isn't data on the Internet before 1998.
Number of employees by sex, economic activity and occupation	EUROSTAT: SES - Structure of Earnings Survey (earn_ses10_54)	2010		Every four years	EU27	Economic activity: NACE Rev.2 Occupation: ISCO08	There is data from 2002 and 2006 classified under NACE Rev. 1.
Number of employees by sex, economic	EUROSTAT: SES - Structure of Earnings Survey	2010		Every four years	EU27	Economic activity: NACE Rev. 2[xv] Educational attainment:	There is some uncompleted data depending on the

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
activity and educational attainment	(earn_ses10_04)					ISCED97 (11)	variables chosen There is data from 2002 and 2006 classified under NACE Rev. 1. The LFS was set up in 1983 but there isn't data on the Internet before 1998.
Total R-D female personnel by sector of employment and field of science	OECD - Joint OECD-Eurostat international data collection on resources devoted to RD	1995	2003		Austria (98/02) Belgium (00/01) Czech Republic (00-03) Denmark (97/01/02) Germany (95/97/99/01) Greece (99/01) Poland (95) Portugal (01) Slovak Republic (95-03) Slovenia (96/98/99/01) Spain (95/97/99/01-03) Sweden (97/99/01)	Fields of science:	There is barely any data if you screen by field of science.
Total R-D female researchers by sector of employment and field of science	OECD - Joint OECD-Eurostat international data collection on resources devoted	1995	2010		Austria (98/04/06/07/09) Belgium (00/01/03-09) Czech Republic (00-	Fields of science: [xviii]	There is barely any data if you screen by field of science.

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
	to RD				10) Denmark (01/03/05/07/09) Estonia (05-09) Germany (01/03/05/07/09) Greece (01) Hungary (06-09) Ireland (02-09) Italy (04-09) Luxemburg (05/09) Poland (03/09) Portugal (00-09) Slovak Republic (00-10) Slovenia (01-09) Spain (01/05-09)		
Gender by type of profession	REFLEX PROJECT	2007			Finland, Czech Republic, Germany, Italy, Austria, Belgium, Netherlands, Switzerland, UK, Norway, France and Estonia	Type of profession: ISCO08	
Graduates working as Science and Technology experts by country and gender	REFLEX PROJECT	2007			Finland, Czech Republic, Germany, Italy, Austria, Belgium, Netherlands, Switzerland, UK, Norway, France and	Type of profession: ISCO08[xix]	

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
					Estonia		
Proportion of female grade A staff by main field of science	WiS database (DG Research and Innovation)	2010			EU27		Non available for the public. It can be consulted through She Figures 2012.

Working conditions

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
Discrimination	Experienced discrimination on the basis of their sex	European Working conditions survey	1990	2010	Every five years	EU27		
Earnings	Hourly wage	European Working conditions survey	1990	2010	Every five years	EU27		
Earnings	Mean annual earnings in high-tech industries and KIS, by sex	EUROSTAT: SES - Structure of Earnings Survey (htec_earn_sex06)	2002	2006	Every four years	EU27	Economic activity: NACE Rev. 1	This data doesn't exist in SES 2010.
Earnings	Mean annual earnings by sex, economic activity and occupation	EUROSTAT: SES - Structure of Earnings Survey (earn_ses10_49)	2010		Every four years	EU27	Economic activity: NACE Rev.2 Occupation: ISCO08[xvi]	There is data from 2002 and 2006 classified under NACE Rev. 1.
Earnings	Mean annual	EUROSTAT: SES -	2010		Every four	EU27	Economic	There is data from

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
	earnings by sex, economic activity and educational attainment	Structure of Earnings Survey (earn_ses10_30)			years		activity: NACE Rev. 2[xxi] Educational attainment: ISCED97[xviii]	2002 and 2006 classified under NACE Rev. 1.
Earnings	Mean monthly hours paid by sex, economic activity and occupation	EUROSTAT: SES - Structure of Earnings Survey (earn_ses10_50)	2010		Every four years	EU27	Economic activity: NACE Rev.2[xxi] Occupation: ISCO08[xvi]	There is data from 2002 and 2006 classified under NACE Rev. 1.
Earnings	Mean monthly hours paid by sex, economic activity and educational attainment	EUROSTAT: SES - Structure of Earnings Survey (earn_ses10_37)	2010		Every four years	EU27	Economic activity: NACE Rev. 2[xxi] Educational attainment: ISCED97[xviii]	There is data from 2002 and 2006 classified under NACE Rev. 1.
Flexible schedule	Difficulty to take an hour or two off work due to personal matters	European Working conditions survey	1990	2010	Every five years	EU27		
GPG	Gender pay gap in unadjusted form in %	EUROSTAT: GPG statistics (earn_gr_gpgr2)	2007	2010	Yearly	EU27 except Greece.	Economic activity: NACE Rev.2[xxi]	There isn't aggregated data for EU27.
Holidays	Mean annual holidays by sex, economic	EUROSTAT: SES - Structure of	2010		Every four years	EU27 except	Economic activity: NACE	There is data from 2002 and 2006

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
	activity and occupation	Earnings Survey (earn_ses10_51)				Sweden.	Rev.2[xxi] Occupation: ISCO08[xvi]	classified under NACE Rev. 1.
Holidays	Mean annual holidays by sex, economic activity and educational attainment	EUROSTAT: SES - Structure of Earnings Survey (earn_ses10_44)	2010		Every four years	EU27	Economic activity: NACE Rev. 2[xxi] Educational attainment: ISCED97[xviii]	There is data from 2002 and 2006 classified under NACE Rev. 1.
Job mobility	Annual data on job-to-job mobility of HRST employed, by sex	EUROSTAT - Human Resources in Science and Technology (HRST) (hrst_fl_mobsex)	1996	2011	Yearly	EU27 except Ireland and Malta.		
Satisfaction	Satisfaction with working conditions	European Working conditions survey	1990	2010	Every five years	EU27		
Satisfaction	Satisfaction with salary	European Working conditions survey	1990	2010	Every five years	EU27		
Stress	Experienced stress at work	European Working conditions survey	1990	2010	Every five years	EU27		
Stress	Enough time to get the job done	European Working conditions survey	1990	2010	Every five years	EU27		
Training	Training paid for or provided by your	European Working conditions survey	1990	2010	Every five years	EU27		

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
	employer or by yourself if self-employed							
Work environment	Feel "at home" in their organisation	European Working conditions survey	1990	2010	Every five years	EU27		
Work environment	Motivation to do their best	European Working conditions survey	1990	2010	Every five years	EU27		
Work environment	Possibility of applying their own ideas in their work	European Working conditions survey	1990	2010	Every five years	EU27		

R&D

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
Total R&D personnel and researchers by sectors of performance, sex and fields of science	EUROSTAT: R&D statistics (rd_p_perssci)	1980	2011	Yearly	EU27	Sectors of performance: Fields of Science: (2)	
Total R&D personnel and researchers, in business enterprise sector by economic	EUROSTAT: R&D statistics (rd_p_bempoccr2)	2005	2011	Yearly		Economic activity: NACE _R2	

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
activity and sex							
Share of researchers in the higher education sector with international mobility experience by field of science and by gender	MORE Study: Mobility Survey of Researchers in the Higher Education Sector	2009	Expected 2013			Field of Science: Natural Sciences and Technology, Medical Sciences and Agriculture, Social Sciences and Humanities	
Female researchers as percentage of total researchers (FTE) - Engineering and technology	UNESCO	1996	2010	Yearly	Bulgaria (96-09) Czech Republic (00-10) Estonia (01-09) Hungary (06-09) Latvia (98-99) Lithuania (01-09) Poland (03-08) Romania (00-09) Slovakia (00-10) Slovenia (01-09) Cyprus (98-09) Malta (05-09) Portugal (00-09)		FTE: Full time equivalence.
Female researchers as percentage of total researchers	UNESCO	1999	2010	Yearly	Bulgaria (99-09) Czech Republic (00-10)		HC: Headcount.

Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
(HC) - Engineering and technology					Estonia (01-09) Hungary (00-09) Lithuania (03/05-09) Poland (03-08) Romania (02-09) Slovakia (02-10) Slovenia (01-09) Cyprus (01-09) Malta (05-09) Portugal (00-09)		
Research funding success rate differences between women and men by field of science	WiS database (DG Research and Innovation)	2010					Non available for the public. It can be consulted through She Studies 2012.

Other relevant indicators

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
Computer learning	Most recent training course on computer use	EUROSTAT - Innovation and information society statistics (isoc_sk_rtc_i)	2003	2011	Yearly	EU27	Females 16-24 Females 16-74 Females 25-54 Females 25-64 Females 55-74	

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
							Females with low formal education Females with medium formal education Females with high formal education	
e-skills	Individuals' level of computer skills	EUROSTAT - Innovation and information society statistics (isoc_sk_cskl_i)	2003	2011	Yearly	EU27	Females 16-24 Females 16-74 Females 25-54 Females 25-64 Females 55-74 Females with low formal education Females with medium formal education Females with high formal education	
e-skills	Individuals' level of Internet skills	EUROSTAT - Innovation and information society statistics (isoc_sk_iskl_i)	2003	2011	Yearly	EU27	Females 16-24 Females 16-74 Females 25-54 Females 25-64 Females 55-74 Females with low formal education Females with medium formal education Females with high formal education	
e-skills	Way of obtaining e-skills	EUROSTAT - Innovation and information society statistics	2005-2006-2007-2011			EU27	Females 16-24 Females 16-74 Females 25-54 Females 25-64	

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Notes
		(isoc_sk_how_i)					Females 55-74 Females with low formal education Females with medium formal education Females with high formal education	
e-skills	Reasons for not having taken a computer course	EUROSTAT - Innovation and information society statistics (isoc_sk_rnct_i)	2007	2011	Each four years	EU27	Females 16-24 Females 16-74 Females 25-54 Females 25-64 Females 55-74 Females with low formal education Females with medium formal education Females with high formal education	There is barely any data when you screen by female's categories.
Leadership	Level of responsibility of women in ICT	European centre for women and technology	2009				Director General Director Head of division or department Team leader Other	NO representative sample: only 158 women have answered.

Incomplete data

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Gap in data
Balance between personal and	Availability of "re-entry"	Corporate Gender Gap Report	2012			Worldwide	Economic Sector:	No data by region.

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Gap in data
professional life	programmes that help those employees stay connected while they are away and facilitate their return to the workplace							
Balance between personal and professional life	Availability of childcare facilities in enterprises	Corporate Gender Gap Report	2012			Worldwide	Economic Sector: [xxv]	No data by region.
Employment	Total R&D personnel and researchers, in business enterprise sector by economic activity and sex	EUROSTAT - innovation and information society statistics (rd_p_bempoccr2)	2005	2011	Yearly	EU27	Occupation: Total R&D personnel// Researchers Economic activity: NACE Rev.2	There isn't data if you screen by sex.
Employment	Percentage of persons employed with ICT specialist skills	EUROSTAT - Survey on Information and Communication Technologies (isoc_ic_bispe)	2000	2010	Yearly	EU27		No data by sex.
Entrepreneurship	Enterprises managed by the founder - by sex of the entrepreneur	EUROSTAT - Structural Business Statistics (SBS) (fobs_gen)	2005		Yearly	Bulgaria Czech Republic Denmark Estonia France Italy Latvia	Economic activity: NACE Rev.1	No data by sector.

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Gap in data
						Lithuania Luxemburg Austria Portugal Romania Slovenia Slovakia Sweden		
Job mobility	Annual data on job-to-job mobility of HRST, employed, 25-64 years old, by selected sector of economic activity (from 2008, NACE Rev. 2)	EUROSTAT - Human Resources in Science and Technology (HRST) (hrst_fl_mobsect2)	2008	2011	Yearly		Economic activity: NACE Rev.2	No data by sex.
Leadership	Proportion and number of women and men among chiefs of executive boards of the top 50 firms	European Commission Database: women & men in decision-making	2003	2012	Yearly	EU27		No data by sector.
Leadership	Proportion and number of women and men among members of executive boards of the top 50 firms	European Commission Database: women & men in decision-making	2003	2012	Yearly	EU27		No data by sector.
Leadership	Number of female-held directorships in ICT companies							This statistic is not created.

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Gap in data
Leadership	Number of female executive directors in ICT companies							This statistic is not created.
Leadership	Number of female non-executive directors in ICT companies							This statistic is not create
Leadership	Companies with specified targets, quotas, or other affirmative policies to increase the percentage of women in senior management or executive positions	Corporate Gender Gap Report	2011			Worldwide	Economic Sector: [xxv]	No data by region.
Leadership	Female CEO's	Corporate Gender Gap Report (World Economic Forum)	2010			Worldwide	Economic Sector: [xxv]	No data by region.
Leadership	Proportion of women on boards	WiS database (DG Research and Innovation)	2010					No data by sector Non available for the public. It can be consulted through She Studies 2012.
Leadership	Proportion of female heads of universities or assimilated institutions based	WiS database (DG Research and Innovation)	2010					No data by sector Non available for the public. It can be

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Gap in data
	on capacity to deliver PhDs							consulted through She Studies 2012.
Learning	Enterprises that provided training to develop/upgrade ICT skills of their personnel	EUROSTAT - Survey on Information and Communication Technologies (isoc_ske_ittn2)	2007	2012	Every five years	EU27	Size of the enterprise	No data by sex.
Lifelong education	Distribution of job-related education and training activities by field	EUROSTAT - Adult Education Survey (trng_aes_166)	2007			There are barely data		No data by sex.
Patents	Patent applications to the EPO by priority year at the national level by sector of economic activity	EUROSTAT - Education, Science and Culture statistics (pat_ep_nnac)	1996	2009	Yearly	EU27	Economic activity: NACE Rev.1	No data by sex.
Patents	Patents granted by the USPTO by priority year at the national level by sector of economic activity	EUROSTAT - Education, Science and Culture statistics (pat_us_nnac)	1996	2009	Yearly	EU27	Economic activity: NACE Rev.1[xxix]	No data by sex.
Patents	Number of patents in the ICT sector	OECD - OECD Patent Database	1981	2010	Yearly	EU27 except Latvia, Lithuania, Romania, Bulgaria, Malta and		No data by sex.

Category	Indicator	Source	First year of the series	Last year of the series	Regularity	Countries included (among EU)	Categories	Gap in data
						Cyprus		
Patents	Proportion of inventive staff that are female in ICT patents	Patent Filings Survey		2011	Yearly	European Patent Convention (EPC) contracting states		The data by sector are not classified by applicants' residence blocs (and the data classified by residence bloc are not classified by sector). The question about gender was introduced in 2011.
Patents & Publications	Patents by sex	Working Paper: Gender-specific patterns in patenting and publishing	2005					No data by sector.
Policy making positions	National ministers by gender	European Commission Database: women & men in decision-making	2003	2012	Yearly	EU27		No data by sector.

Categories references

[i]Field of education: ISC

TOTAL	Total
EF14	Teacher training and education science
EF141	Teaching and training
EF142	Education Science
EF2	Humanities and arts
EF21	Arts
EF22	Humanities
EF3	Social sciences, business and law
EF31	Social and behavioural science
EF32	Journalism and information
EF34	Business and administration
EF38	Law
EF4	Science, mathematics and computing
EF42	Life science
EF44	Physical science
EF46	Mathematics and statistics
EF48	Computing
EF5	Engineering, manufacturing and construction
EF52	Engineering and engineering trades
EF54	Manufacturing and processing
EF58	Architecture and building
EF6	Agriculture and veterinary
EF62	Agriculture, forestry and fishery
EF64	Veterinary
EF7	Health and Welfare
EF72	Health
EF76	Social services
EF8	Services
EF81	Personal services

EF84 Transport services

EF85 Environmental protection

EF86 Security services

UNK Unknown

[ii]Level of education: ISCED97

ED5_6 First and second stage of tertiary education (levels 5 and 6)

ED5A First stage of tertiary education, programmes that are theoretically based/research preparatory or giving access to professions with high skills requirements (level 5A)

ED5B First stage of tertiary education, programmes which are practically oriented and occupationally specific (level 5B)

ED6 Second stage of tertiary education leading to an advanced research qualification (level 6)

[iii]Level of education: ISCED97

ED5_6 First and second stage of tertiary education (levels 5 and 6)

ED5 First stage of tertiary education not leading directly to an advanced research qualification (level 5)

ED6 Second stage of tertiary education leading to an advanced research qualification (level 6)

[iv]Field of education: ISC

TOTAL Total

EF4_5 Science, mathematics and computing, engineering, manufacturing and construction

EF4 Science, mathematics and computing

EF5 Engineering, manufacturing and construction

UNK Unknown

[v]Level of education: ISCED97

ED3VPV Upper secondary education (level 3) - pre-vocational and vocational programme orientation

ED4VPV Post-secondary non-tertiary education (level 4) - pre-vocational and vocational programme orientation

ED5_6 First and second stage of tertiary education (levels 5 and 6)

ED5AD1 First stage of tertiary education, programmes that are theoretically based/research preparatory or giving access to professions with high skills requirements (first degree of level 5A)

ED5AD2 First stage of tertiary education, programmes that are theoretically based/research preparatory or giving access to professions with high skills requirements (second degree of level 5A)

ED5BQ1 First stage of tertiary education, programmes which are practically oriented and occupationally specific (first qualification of level 5B)

ED5BQ2 First stage of tertiary education, programmes which are practically oriented and occupationally specific (second qualification of level 5B)

ED6 Second stage of tertiary education leading to an advanced research qualification (level 6)

ED6PHD Doctor of Philosophy (Ph.D.)

[vi]Level of education: ISCED97

ED5_6 First and second stage of tertiary education (levels 5 and 6)

ED5 First stage of tertiary education not leading directly to an advanced research qualification (level 5)

ED6 Second stage of tertiary education leading to an advanced research qualification (level 6)

ED6PHD Doctor of Philosophy (Ph.D.)

[vii]Category:

HRST Human Resources in Science and Technology

HRSTE Human Resources in Science and Technology - Education

HRSTO Human Resources in Science and Technology - Occupation

HRSTC Human Resources in Science and Technology - Core

SE Scientists and Engineers

[viii]Economic activity: NACE Rev. 2

TOTAL Total - All NACE activities

HTC High-technology sectors (high-technology manufacturing and knowledge-intensive high-technology services)

C Manufacturing

C_HTC_MH High and medium high-technology manufacturing

G-U Services

KIS Total knowledge-intensive services

UNK Unknown NACE activity

[ix]Category:

HRSTE Human Resources in Science and Technology - Education

[x]Category:

HRSTU Human Resources in Science and Technology - Unemployed

NON_HRSTU Human Resources not in Science and Technology - Unemployed

[xi]Economic activity: NACE Rev.2

TOTAL Total - All NACE activities

A_B Agriculture, forestry and fishing; mining and quarrying

HTC High-technology sectors (high-technology manufacturing and knowledge-intensive high-technology services)

C Manufacturing

C_HTC_MH High and medium high-technology manufacturing

C_HTC_M Medium high-technology manufacturing

C_HTC High-technology manufacturing

C_LTC_LM Low and medium low-technology manufacturing

C_LTC_M Medium low-technology manufacturing

C_LTC Low-technology manufacturing

D-F Electricity, gaz, steam and air conditioning supply; water supply and construction

G-U Services

G_I_T Wholesale and retail trade; accommodation and food service activities; activities of households as employers

H49-H52_N79 Land transport, transport via pipelines, water transport, air transport, warehousing and support activities for transportation; travel agency, tour...

KIS Total knowledge-intensive services
KIS_HTC Knowledge-intensive high-technology services
KIS_MKT_OTH Knowledge-intensive market services (except financial intermediation and high-technology services)
KIS_OTH Other knowledge-intensive services
LKIS Total less knowledge-intensive services
LKIS_MKT Less knowledge-intensive market services
LKIS_OTH Other less knowledge-intensive services
J Information and communication
K_L Financial and insurance activities; real estate activities
K Financial and insurance activities
M Professional, scientific and technical activities
N Administrative and support service activities
O_U Public administration; activities of extraterritorial organisations and bodies
P Education
Q Human health and social work activities
R Arts, entertainment and recreation
S Other service activities
UNK Unknown NACE activity

[xii] Economic activity: NACE Rev. 2

A-S All NACE activities (except activities of households as employers and as own use producers; activities of extra-territorial organisations and bodies)
A Agriculture, forestry and fishing
B-S Industry, construction and services (except activities of households as employers and extra-territorial organisations and bodies)
B-N Business economy
B-F Industry and construction
B-E Industry (except construction)
B Mining and quarrying
C Manufacturing
D Electricity, gas, steam and air conditioning supply
E Water supply; sewerage, waste management and remediation activities
F Construction
G-N Services of the business economy
G-I Wholesale and retail trade, transport, accommodation and food service activities
G Wholesale and retail trade; repair of motor vehicles and motorcycles
H Transportation and storage
I Accommodation and food service activities

J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M_N	Professional, scientific and technical activities; administrative and support service activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O-S	Public administration and defence; compulsory social security; education; human health and social work activities; arts, entertainment and recreati...
O-Q	Public administration, defence, education, human health and social work activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
Q87	Residential care activities
Q88	Social work activities without accommodation
R_S	Arts, entertainment and recreation; other service activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

[xiii]Occupation: ISCO08

TOTAL	Total
OC1	Managers
OC2	Professionals
OC3	Technicians and associate professionals
OC4	Clerical support workers
OC5	Service and sales workers
OC6	Skilled agricultural, forestry and fishery workers
OC7	Craft and related trades workers
OC8	Plant and machine operators, and assemblers
OC9	Elementary occupations
OC0	Armed forces occupations
UNK	Unknown

[xiv]Economic activity: NACE Rev. 2

TOTAL	Total - All NACE activities
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing

D Electricity, gas, steam and air conditioning supply
E Water supply; sewerage, waste management and remediation activities
F Construction
G Wholesale and retail trade; repair of motor vehicles and motorcycles
H Transportation and storage
I Accommodation and food service activities
J Information and communication
K Financial and insurance activities
L Real estate activities
M Professional, scientific and technical activities
N Administrative and support service activities
O Public administration and defence; compulsory social security
P Education
Q Human health and social work activities
R Arts, entertainment and recreation
S Other service activities
T Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U Activities of extraterritorial organisations and bodies
NRP No response

[xv] Economic activity: NACE Rev. 2

B-S Industry, construction and services (except activities of households as employers and extra-territorial organisations and bodies)
B-S_X_O Industry, construction and services (except public administration, defense, compulsory social security)
B-N Business economy
B-F Industry and construction
B-E Industry (except construction)
B Mining and quarrying
C Manufacturing
D Electricity, gas, steam and air conditioning supply
E Water supply; sewerage, waste management and remediation activities
F Construction
G-S Services (except activities of households as employers and extra-territorial organisations and bodies)
G-S_X_O Services (except public administration, defense, compulsory social security, activities of households as employers and extra-territorial organisati...
G-J Wholesale and retail trade; transport; accommodation and food service activities; information and communication
G Wholesale and retail trade; repair of motor vehicles and motorcycles
H Transportation and storage

I Accommodation and food service activities
J Information and communication
K-N Financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service a...
K Financial and insurance activities
L Real estate activities
M Professional, scientific and technical activities
N Administrative and support service activities
O-S Public administration and defence; compulsory social security; education; human health and social work activities; arts, entertainment and recreati...
O Public administration and defence; compulsory social security
P-S Education; human health and social work activities; arts, entertainment and recreation; other service activities
P Education
Q Human health and social work activities
R Arts, entertainment and recreation
S Other service activities

[xvi] Occupation: ISCO08

TOTAL Total
OC1-5 Non manual workers
OC1 Managers
OC2 Professionals
OC3 Technicians and associate professionals
OC4 Clerical support workers
OC5 Service and sales workers
OC6 Skilled agricultural, forestry and fishery workers
OC7-9 Manual workers
OC7 Craft and related trades workers
OC8 Plant and machine operators, and assemblers
OC9 Elementary occupations
OC0 Armed forces occupations

[xvii] Education attainment: ISCED97

TOTAL All ISCED 1997 levels
ED0_1 Pre-primary and primary education (levels 0 and 1)
ED2 Lower secondary or second stage of basic education (level 2)
ED3_4 Upper secondary and post-secondary non-tertiary education (levels 3 and 4)
ED5A First stage of tertiary education, programmes that are theoretically based/research preparatory or giving access to professions with high skills requirements (level 5A)
ED5B First stage of tertiary education, programmes which are practically oriented and occupationally specific (level 5B)

ED6 Second stage of tertiary education leading to an advanced research qualification (level 6)
UNK Unknown
[xviii] Fields of science
All fields of science
Natural sciences and engineering
Natural Sciences
Engineering and technology
Medical and Health sciences
Agricultural Sciences
Social sciences and humanities
Social Siences
Humanities
Not elsewhere classified (Fields of Science)
[xix] Type of profession: ISCO08
"Non-professionals"
Business and social science experts
Science and technology experts
Semi-professions
Classical professions
Managers
[xx] Economic activity: NACE Rev.1
HTC High-technology sectors (high-technology manufacturing and knowledge-intensive high-technology services)
D_HTC High-technology manufacturing (DG24.4, DL30, DL32, DL33, DM35.3)
D_HTC_M Medium high-technology manufacturing (DG (except DG24.4); DK, DL31, DM34, DM35.2, DM35.4, DM35.5)
D_LTC_M Medium low-technology manufacturing (DF, DH to DJ and DM35.1)
D_LTC Low-technology manufacturing (DA to DE and DN)
KIS_HTC Knowledge-intensive high-technology services (I64, K72 and K73)
KIS_MKT_OTH Knowledge-intensive market services (except financial intermediation and high-technology services)
J Financial intermediation
KIS_OTH Other knowledge-intensive services
LKIS_MKT Less knowledge-intensive market services
D Manufacturing
G-K Services (except public administration and community services; activities of households and extra-territorial organisations)
[xxi] Economic activity: NACE Rev.2
B-S Industry, construction and services (except activities of households as employers and extra-territorial organisations and bodies)

B-S_X_O Industry, construction and services (except public administration, defense, compulsory social security)
B-N Business economy
B Mining and quarrying
C Manufacturing
D Electricity, gas, steam and air conditioning supply
E Water supply; sewerage, waste management and remediation activities
F Construction
G Wholesale and retail trade; repair of motor vehicles and motorcycles
H Transportation and storage
I Accommodation and food service activities
J Information and communication
K Financial and insurance activities
L Real estate activities
M Professional, scientific and technical activities
N Administrative and support service activities
O Public administration and defence; compulsory social security
P Education
Q Human health and social work activities
R Arts, entertainment and recreation
S Other service activities

[xxii] Sectors of performance

BES Business enterprise sector
GOV Government sector
HES Higher education sector
PNP Private non-profit sector

[xxiii] Fields of science

FOS1-4 Natural sciences, Engineering and technology, Medical and health sciences, Agricultural sciences
FOS1 Natural sciences
FOS101 Mathematics
FOS102 Computer and information sciences
FOS103 Physical sciences
FOS104 Chemical sciences
FOS105 Earth and related environmental sciences
FOS106 Biological sciences
FOS107 Other natural sciences

FOS2 Engineering and technology
FOS201 Civil engineering
FOS202 Electrical engineering, electronic engineering, information engineering
FOS203 Mechanical engineering
FOS204 Chemical engineering
FOS205 Materials engineering
FOS206 Medical engineering
FOS207 Environmental engineering
FOS208 Environmental biotechnology
FOS209 Industrial Biotechnology
FOS210 Nano-technology
FOS211 Other engineering and technologies
FOS3 Medical and health sciences
FOS301 Basic medicine
FOS302 Clinical medicine
FOS303 Health sciences
FOS304 Health biotechnology
FOS305 Other medical sciences
FOS4 Agricultural sciences
FOS401 Agriculture, forestry, and fisheries
FOS402 Animal and dairy science
FOS403 Veterinary science
FOS404 Agricultural biotechnology
FOS405 Other agricultural sciences
FOS5_6 Social sciences and Humanities
FOS5 Social sciences
FOS501 Psychology
FOS502 Economics and business
FOS503 Educational sciences
FOS504 Sociology
FOS505 Law
FOS506 Political Science
FOS507 Social and economic geography
FOS508 Media and communications
FOS509 Other social sciences

FOS6 Humanities
FOS601 History and archaeology
FOS602 Languages and literature
FOS603 Philosophy, ethics and religion
FOS604 Art (arts, history of arts, performing arts, music)
FOS605 Other humanities
NSP Not specified

[xxiv] Economic activity: NACE R2

A Agriculture, forestry and fishing
B Mining and quarrying
C Manufacturing
C10-C12 Manufacture of food products; beverages and tobacco products
C10_C11 Manufacture of food products and beverages
C12 Manufacture of tobacco products
C13-C15 Manufacture of textiles, wearing apparel, leather and related products
C13 Manufacture of textiles
C14 Manufacture of wearing apparel
C15 Manufacture of leather and related products
C16-C18 Manufacture of wood, paper, printing and reproduction
C16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
C17 Manufacture of paper and paper products
C18 Printing and reproduction of recorded media
C182 Reproduction of recorded media
C19 Manufacture of coke and refined petroleum products
C20 Manufacture of chemicals and chemical products
C21 Manufacture of basic pharmaceutical products and pharmaceutical preparations
C22 Manufacture of rubber and plastic products
C23 Manufacture of other non-metallic mineral products
C24 Manufacture of basic metals
C24_FER Manufacture of basic iron and steel and of ferro-alloys; of tubes, pipes, hollow profiles, related fittings and other products of first processing ...
C24_NFER Manufacture of basic precious and other non-ferrous metals; casting of light metals and other non-ferrous metals
C25 Manufacture of fabricated metal products, except machinery and equipment
C254 Manufacture of weapons and ammunition
C25-C30 Manufacture of fabricated metal products, computer, electronic and optical products, electrical equipment, machinery, motor vehicles and other tran...
C26 Manufacture of computer, electronic and optical products

C261	Manufacture of electronic components and boards
C262	Manufacture of computers and peripheral equipment
C263	Manufacture of communication equipment
C264	Manufacture of consumer electronics
C265	Manufacture of instruments and appliances for measuring, testing and navigation; watches and clocks
C266	Manufacture of irradiation, electromedical and electrotherapeutic equipment
C267	Manufacture of optical instruments and photographic equipment
C268	Manufacture of magnetic and optical media
C27	Manufacture of electrical equipment
C28	Manufacture of machinery and equipment n.e.c.
C29	Manufacture of motor vehicles, trailers and semi-trailers
C30	Manufacture of other transport equipment
C301	Building of ships and boats
C302	Manufacture of railway locomotives and rolling stock
C303	Manufacture of air and spacecraft and related machinery
C304	Manufacture of military fighting vehicles
C309	Manufacture of transport equipment n.e.c.
C31	Manufacture of furniture
C32	Other manufacturing
C325	Manufacture of medical and dental instruments and supplies
C33	Repair and installation of machinery and equipment
D_E	Electricity, gas, steam, air conditioning and water supply
D35_E36	Electricity, gas, steam and air conditioning supply; water collection, treatment and supply
E37-E39	Sewerage, waste management, remediation activities
F	Construction
G-N	Services of the business economy
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
G465	Wholesale of information and communication equipment
H	Transportation and storage
H49	Land transport and transport via pipelines
H50	Water transport
H51	Air transport
H52	Warehousing and support activities for transportation
H53	Postal and courier activities
I	Accommodation and food service activities

J Information and communication
J58-J60 Publishing, motion picture, video, television programme production; sound recording, programming and broadcasting activities
J58 Publishing activities
J581 Publishing of books, periodicals and other publishing activities
J582 Software publishing
J59_J60 Motion picture, video, television programme production; programming and broadcasting activities
J59 Motion picture, video and television programme production, sound recording and music publishing activities
J60 Programming and broadcasting activities
J61 Telecommunications
J62 Computer programming, consultancy and related activities
J63 Information service activities
J631 Data processing, hosting and related activities; web portals
J639 Other information service activities
K Financial and insurance activities
L68 Real estate activities
M_N Professional, scientific and technical activities; administrative and support service activities
M Professional, scientific and technical activities
M72 Scientific research and development
N Administrative and support service activities
N77 Rental and leasing activities
N78 Employment activities
N79 Travel agency, tour operator reservation service and related activities
N80 Security and investigation activities
N81 Services to buildings and landscape activities
N82 Office administrative, office support and other business support activities
O_P Public administration and defence; compulsory social security and education
O84 Public administration and defence; compulsory social security
P85 Education
Q Human health and social work activities
Q86 Human health activities
Q87_Q88 Residential care activities and social work activities without accommodation
R Arts, entertainment and recreation
S-U Other service activities; activities of households as employers and extraterritorial organisations and bodies
S951 Repair of computers and communication equipment

[xxv] Economic Sector

Agriculture
Automotive
Chemicals
Energy
Engineering & Construction
Financial Services & Insurance
Food & Beverage
Health
IT & Telecom
Logistics & Transport
Media & Entertainment
Mining
Professional Services
Real Estate
Textile
Travel & Tourism

[xvi] Economic activity: NACE Rev. 2

C31	Manufacture of furniture
C32	Other manufacturing
C325	Manufacture of medical and dental instruments and supplies
C33	Repair and installation of machinery and equipment
D_E	Electricity, gas, steam, air conditioning and water supply
D35_E36	Electricity, gas, steam and air conditioning supply; water collection, treatment and supply
E37-E39	Sewerage, waste management, remediation activities
F	Construction
G-N	Services of the business economy
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
G465	Wholesale of information and communication equipment
H	Transportation and storage
H49	Land transport and transport via pipelines
H50	Water transport
H51	Air transport
H52	Warehousing and support activities for transportation
H53	Postal and courier activities
I	Accommodation and food service activities

J Information and communication
J58-J60 Publishing, motion picture, video, television programme production; sound recording, programming and broadcasting activities
J58 Publishing activities
J581 Publishing of books, periodicals and other publishing activities
J582 Software publishing
J59_J60 Motion picture, video, television programme production; programming and broadcasting activities
J59 Motion picture, video and television programme production, sound recording and music publishing activities
J60 Programming and broadcasting activities
J61 Telecommunications
J62 Computer programming, consultancy and related activities
J63 Information service activities
J631 Data processing, hosting and related activities; web portals
J639 Other information service activities
K Financial and insurance activities
L68 Real estate activities
M_N Professional, scientific and technical activities; administrative and support service activities
M Professional, scientific and technical activities
M72 Scientific research and development
N Administrative and support service activities
N77 Rental and leasing activities
N78 Employment activities
N79 Travel agency, tour operator reservation service and related activities
N80 Security and investigation activities
N81 Services to buildings and landscape activities
N82 Office administrative, office support and other business support activities
O_P Public administration and defence; compulsory social security and education
O84 Public administration and defence; compulsory social security
P85 Education
Q Human health and social work activities
Q86 Human health activities
Q87_Q88 Residential care activities and social work activities without accommodation
R Arts, entertainment and recreation
S-U Other service activities; activities of households as employers and extraterritorial organisations and bodies
S951 Repair of computers and communication equipment

[xvii] Economic activity: NACE Rev. 1

C-K_X_K7415 Industry and services (except management activities of holding companies; public administration and community services; activities of households an...

C-E Industry (except construction)

F Construction

G-K_X_K7415 Services (except management activities of holding companies; public administration and community services; activities of households and extra-terri...

G Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods

H Hotels and restaurants

I Transport, storage and communication

J Financial intermediation

K_X_K7415 Real estate (except management activities of holding companies)

[xxviii] Economic activity: NACE Rev.2

TOTAL Total - All NACE activities

C Manufacturing

G-U Services

KIS Total knowledge-intensive services

LKIS Total less knowledge-intensive services

[xxix] Economic activity: NACE Rev.1

D Manufacturing

DA15 Manufacture of food products and beverages

DA16 Manufacture of tobacco products

DB17 Manufacture of textiles

DB18 Manufacture of wearing apparel; dressing; dyeing of fur

DC19 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear

DD20 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials

DE21 Manufacture of pulp, paper and paper products

DE22 Publishing, printing and reproduction of recorded media

DF23 Manufacture of coke, refined petroleum products and nuclear fuel

DG241 Manufacture of basic chemicals

DG242 Manufacture of pesticides and other agro-chemical products

DG243 Manufacture of paints, varnishes and similar coatings, printing ink and mastics

DG244 Manufacture of pharmaceuticals, medicinal chemicals and botanical products

DG245 Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations

DG246 Manufacture of other chemical products

DG247 Manufacture of man-made fibres

DH25 Manufacture of rubber and plastic products

DI26 Manufacture of other non-metallic mineral products
DJ27 Manufacture of basic metals
DJ28 Manufacture of fabricated metal products, except machinery and equipment
DK291 Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines
DK292 Manufacture of other general purpose machinery
DK293 Manufacture of agricultural and forestry machinery
DK294 Manufacture of machine-tools
DK295 Manufacture of other special purpose machinery
DK296 Manufacture of weapons and ammunition
DK297 Manufacture of domestic appliances n.e.c.
DL30 Manufacture of office machinery and computers
DL311 Manufacture of electric motors, generators and transformers
DL312_DL313 Manufacture of electricity distribution, control apparatus and insulated wire and cable
DL314 Manufacture of accumulators, primary cells and primary batteries
DL315 Manufacture of lighting equipment and electric lamps
DL316 Manufacture of electrical equipment n.e.c.
DL321 Manufacture of electronic valves and tubes and other electronic components
DL322 Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
DL323 Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
DL331 Manufacture of medical and surgical equipment and orthopaedic appliances
DL332 Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
DL333 Manufacture of industrial process control equipment
DL334 Manufacture of optical instruments and photographic equipment
DL335 Manufacture of watches and clocks
DM34 Manufacture of motor vehicles, trailers and semi-trailers
DM35 Manufacture of other transport equipment
DN36 Manufacture of furniture; manufacturing n.e.c.

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