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Appendices

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Impact of structural changes on jobs and industrial relations in the telecommunications and ICT

Employment, Social Affairs & Inclusion
Study mapping the structural changes and their impacts on jobs and industrial relations in the telecommunications and ICT sectors

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2   Methodology

While the main objective of the study was to explore how technological and structural changes in the telecommunications and ICT sectors have affected the boundaries of the sectors (and how this affects the definition of the sectors), their employees and industrial relations, the analysis was driven by three concrete research interests:

- Firstly, to map the economic activities of the sectors and assess major trends of structural change, such as divergence or convergence between different subsectors or the perception of belonging to one sector. This included reflections on various concepts and approaches to define the telecommunications and ICT sectors in terms of statistical classification of economic activities and employment.

- Secondly, to map and analyse the employment and working conditions of the sectors (such as salary levels, working time, job security, contractual situations, career conditions, qualification and skills development). This also involved the question about the total number of jobs in the telecommunications and ICT sectors (here, extremely large differences exist), the emergence of new types of employment (individualisation of work, e.g. freelancing, self-employment) and employment conditions trends in different types of enterprises (small versus large, incumbents versus new entrants).

- And thirdly, to map and analyse current industrial relations structures and practices in the telecommunications and ICT sectors in particular concerning different sub-sectoral, enterprise and/or country-specific trends and patterns. In this context, a specific interest of the research was to analyse and determine motivations and incentives of employers and workers (including self-employed and freelance workers) to engage/participate in formal structures of interest representation and collective bargaining.

A methodology consisting of three main tasks was selected:

1.   Desk study consisting of a literature review and statistical data

2.   Field study consisting of case studies and interviews

3.   Final analysis where the study questions are answered.

Each of these three tasks is elaborated below.

2.1   Task 1: Desk study

The desk study aimed to review existing literature and statistical data.

2.1.1   Literature review

The contribution from literature was particularly valuable for understanding the difficulties already experienced in defining the telecommunications and ICT sectors. Relevant literature was identified through academic databases and sector experts. The list of literature consulted is included in Appendix 1.

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2.1.2   Statistical data

Statistical data were used to analyse recent developments in the telecommunications and ICT sectors and to compare sector developments with overall developments in the economies of the Member States.

It is important to remember that the validity and comparability of the data in question must be considered every time statistical data are used.

The study is mainly based on data gathered at EU level. From Eurostat, we received a special sample of the European Labour Force Survey (LFS) containing information on the employed labour force (e.g. number, sex, age), and which also covers the relevant NACE codes. However, information from the LFS is only available on a three-digit NACE code level. As a consequence, for some of the NACE codes used to define the telecommunications and ICT sectors, data cannot be obtained. Furthermore, LFS data on the different case countries are rather fragmented. In for example Denmark, LFS information is only available for two subsectors. Due to the change in the NACE code classification in 2008, data on employees in the sectors are only available for the period 2008-2013.

From Eurostat, we have also used the Structural Business Statistics (SBS)[1], which contains information about the number of companies and the annual turnover. We have used data both at the European level and at the case country level. LFS data are only available from 2008 onwards. Furthermore, for most subsectors and case countries, data are only available up to 2011. As the SBS data are very fragmented, information is only available for some subsectors in some years and for some of the case countries. In the report, we present the data that were available for each case country. This means that comparisons between case countries are not always accurate and representative. Data on company size or earnings have not been available at a sufficiently detailed level.

Moreover, in the case countries, information from national statistical offices was accessed. It is not possible, though, to compare data from different countries, as methodologies for gathering and structuring the data differ.

Finally, data from other sources were included to illustrate the development of the telecommunications sector since the 1980s. Data are very fragmented and only available from different sources. The information included in the different categories has changed over time, and the figures are therefore not directly comparable.

2.2   Task 2: Field studies

From the very beginning of the study, it was acknowledged that many of the study questions could not be answered solely on the basis of existing literature and official statistics, and so there was a need to gather additional information through a case study approach and interviews with selected stakeholders. In this context, task 1 led

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[1] Covers only EU 27, as Croatia is not included.

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to the identification of information gaps to be covered by the case studies and stakeholder interviews.

The next sections elaborate on the methodology of the case studies and interviews.

2.2.1   Case studies - Member States

Contribution of the case studies

The case studies provide country specific information to illustrate more specific findings at MS level. Each case study does not answer all the study questions, but aim to illustrate the development in different clusters of countries and inform the analysis at EU-28 level. Each Member State case study contributed to informing the study questions by reviewing national sector-specific reports and technology outlooks and by analysing national data sets and by obtaining the views of national stakeholders through a number of interviews. The interview methodology and the selection of interviewees are elaborated on in section 2.2.3.

Eight Member States were selected for detailed case study analyses. The selection was done based on a clustering exercise, which was inspired by Bechter et al. (2012). As shown below, Bechter et al. classified Member States into a category named "in general" and the telecommunications sector into a category named "in particular" according to the following typology of clusters:

- Dense: the sectors in the cluster have "dense" industrial relations in the sense that they involve strong and numerous actors at many levels, which are extensively engaged in collective bargaining and involved in policy-making.

- Political: the sectors in the cluster demonstrate a high degree of centralisation and coverage, despite relatively low union density. Collective bargaining relies either on strong employer organisations or on state intervention.

- Lean: the sectors most frequently present in the cluster are those once dominated by national providers.

- Fragile: the cluster is a residual one. The sectors are characterised by a rather distinctive disorganisation in terms of industrial relationships.

- Empty: the industrial relationships are characterised by very low organisational density and collective bargaining coverage.

Table 2-1   Clusters of Member States

	Dense	Political	Lean	Fragile	Empty
Member States (in general)	DK, FI, SE	AT, BE, DE, LU, NL, SI	EL, ES, FR, IT, PT	IE, CY, MT, UK, HR*	BG, CZ, EE, LV, LT, HU, PL, RO, SK
Telecommunications sector (in particular)	DK, FI, FR, MT, SE	AT, EE, IT, NL, SK, ES	BE, CY, EL, HU, LV, LT, RO	DE, PL, SI, UK, HR*	BG, CZ, LU, PT

Source: Bechter et al. (2012) and COWI.
*Note: * COWIs assessment: Croatia was not included in the 2012 typology.*

From these five clusters, we selected the Member States that were eligible for detailed case study analysis by applying the following additional criteria: variation in the share

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of SMEs of the Member States' economies, in the size of their telecommunications and ICT sectors, and in the trends in the sectors' employment and economic growth.

Table 2-2   Member States selected for detailed case study analysis

	Dense	**Political**	**Lean**	**Fragile**	**Empty**
Selected Member States	Denmark France	Estonia	Romania	Germany Ireland	Czech Republic Portugal

Table 2-3   Member States selected for detailed case study analysis sorted according to the Visser typology

	Nordic Model	**Social Partnership Model**	**State-centred/ Southern European**	**Anglo/Saxon/ Liberal**	**Mixed/Central Eastern European**
Selected Member States	Denmark	Germany	France Portugal	Ireland	Czech Republic Estonia Romania

2.2.2   Case studies - multinational companies

Contribution of the case studies

The case studies of multinational companies aim to illustrate how large companies perceive the study questions. Findings are included in the main analysis to illustrate certain phenomena identified.

The case studies and examples drawn from these do not necessarily represent a general opinion or the state-of-play of multinational companies.

The case studies were prepared based on a desk study of publicly available information, including annual reports from the companies. In some cases information from the media was added. Information based on news reports has not been validated by other sources, but contributes to the analysis, as it is not necessarily conveying the same messages as the information gathered from the companies – either by interviews or from written sources.

As for Teleperformance and Acxiom no interview could be conducted, these case studies are thus only based on desk studies.

Selection of the case studies

The five multinational companies selected for detailed case study analysis are presented in Table 2-4 below using the following criteria:

▪ to include at a minimum one multinational company, which provides multiple substitute services – i.e. a multiple play provider. *Multiple play* is an expression of the broader convergence trend, which involves reducing distinctions between previously separate market segments, technologies and services. The selection of a multiple play providers thus allows for a better understanding of the convergence trend in the market.

▪ to include at a minimum two multinational companies affected by the liberalisation trend – i.e. one company, which has undergone a transition from a previous state monopoly to a private sector provider ("a restructured monopoly") and one

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company, which has been established in the liberalised market ("new-comer"). While the former is essential for the mapping of the transition from public sector to private sector employment and, in particular, the effects of such transition on the organisation of working conditions and industrial relationships, the latter is crucial to gain a deeper understanding of the liberalisation trend and its effects.

▪ to include multinational companies that cover the different telecommunications and ICT subsectors.

Table 2-4   Five multinational companies selected for detailed case study analysis

Company	Sector	Restructured monopoly	New-comer	Multiple play provider	Characteristics
Telefónica	Telecommunications	X		X	Telefónica is a Spanish multinational telecommunications company providing a full range of telecommunications services, including broadband and entertainment services. Telefónica has one of the most international profiles in the sector with more than 76% of its business outside its home market. Telefónica is present in most Member States.
Vodafone Group plc	Telecommunications		X	X	Vodafone is a British multinational telecommunications company providing mobile telecommunications services, including mobile e-mail and broadband.
IBM Global Services	Computer programming, ICT consultancy and related activities		(X)	X	IBM Global Services is the world's largest business and technology service provider with headquarters in the US and extensive operations in Europe. It aims at helping other companies manage their IT operations and resources.
Acxiom Corporation	Information services and activities		X		Acxiom Corporation is a US-based enterprise data, analytics and software service company with offices in the United Kingdom, France, Germany and Poland.
Tele-performance	Call centres activities		X		Teleperformance is a global customer service, technical support, call centre, debt collection and social media company with headquarters in France.

2.2.3   Interviews

Contribution of interviews

The interviews served to inform the analysis at case study level – country and company levels – and at EU level. An interview guide was developed based on an information gap analysis of information gathered under task 1. The interview guide (enclosed in Appendix 6) is structured according to the key aspects of the study to

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guide the interviewees through the study questions asking them to reflect on the study questions.

The interview guide was semi-structured and consisted of both quantitative and qualitative questions. It must be noted that interviews was conducted with a limited number of stakeholders and does not cover a representative selection. Merely it provides an indication of the opinions of some of the key stakeholders in the sector.

The first section of the interview guide presented a broader definition of the telecommunications and ICT sectors by combining qualitative statements and additional NACE codes and OECD/ITU definitions. Overall, the questions in this section investigated the boundaries of the telecommunications and ICT sectors through a variety of angles, e.g. NACE codes, formal definitions, economic activities and the stakeholders' perception.

The second set of study questions investigated the patterns of employment and the working conditions in order to define the telecommunications and ICT landscape.

The second section on employment and working conditions addressed the latest restructuring of the sectors and evaluated the consequences for employment and working conditions in these sectors. The questions also addressed the influences of the technological developments, skills and specialisation. The section was concluded by specific questions on self-employed and freelance workers. Overall, the questions in this section investigated employment patterns and working conditions in order to establish knowledge about past, present and future trends in the telecommunications and ICT sectors.

The third set of study questions focused on social dialogue and collective bargaining coverage. Here, the approaches might vary according to the nature of the stakeholder, e.g. trade union or multinational organisation. The questions were phrased to investigate collective bargaining and the working conditions in multinational companies. Moreover, the questions addressed the current trends on collective bargaining and outsourcing in the sector. Overall, the questions in this section investigated the industrial relations in the telecommunications and ICT sectors, i.e. the availability and coverage of collective bargaining and the decisions to externalise and outsource economic activities.

Selection of interviewees
140 stakeholders were contacted for interviews and a total of 34 interviews were conducted. The list of interviewees is enclosed in Appendix 5. Other than what is mentioned under identification of the multinational companies, stakeholders for interviews were first of all selected from a list of potential stakeholders to be consulted as indicated by the European Commission and, secondly, by identifying relevant social partner organisations at the European level and then trickling down to national and company level from there. The majority of the interviews were conducted by phone.

As mentioned above, the number of interviews carried out is relatively limited. Thus, the opinions of the stakeholders are not necessarily representative of the sector as a whole, but provide an indication of what the opinions of the sectors are.

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Table 2-5   Overview of the organisations invited to take part in the project and interviews conducted.

Type of organisation	Geography	Name	Status
Employer organisation	Bulgaria	BASSCOM - Bulgarian Association of Software Companies	Completed
Employer organisation	Bulgaria	ICT Cluster Bulgaria	Completed
Worker organisation	Denmark	Dansk Metal	Completed
Worker organisation	Denmark	Ida - The society of Danish engineers	Completed
Employer organisation	Denmark	DI ITEK	Completed
Employer organisation	Denmark	IT-Branchen	Completed
Multinational	Estonia	AS Proekspert	
Worker organisation	EU	UNI Europa	Completed
Worker organisation	EU	CESI	Completed
Worker organisation	EU	industriAll	Completed
Employer organisation	EU	EITO	Completed
Employer organisation	EU	Italian National Internet Providers Association	Completed
Employer organisation	EU	Digital Europe	Completed
Employer organisation	EU	ETNO	Completed
Employer organisation	EU	PIN-SME	Completed
Professional organisation	EU	OW2	Completed
Professional organisation	EU	Wind	Completed
Worker organisation	France	F3F CFDT - Fédération Communication Conseil Culture	Completed
Worker organisation	France	UGICT-CGT - Union Générale des Ingénieurs, Cadres et Techniciens	Completed
Multinational	Global	Telenor	Completed
Multinational	Global	Telefónica	Completed
Multinational	Global	IBM	Completed
Multinational	Global	Vodafone	Completed

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Type of organisation	Geography	Name	Status
Employee organisation	Ireland	CWU - Communications Workers' Union	Completed
Worker organisation	Portugal	Sinttav	Completed
Worker organisation	Portugal	SINDTELCO - Sindicato Democrático dos Trabalhadores das Comunicacões e dos Media	Completed
Worker organisation	Portugal	STPT - Sindicato dos Trabalhadores do Grupo Portugal Telecom	Completed
Employer organisation	Portugal	Inova-ria	Completed
Employee organisation	Romania	FSCOM - Trade Union Federation of Communication	Completed

2.3 Task 3: Final analysis

The overall purpose of Task 3 was to provide an analysis of the information gathered from the data and the literature review (Task 1) and the data collected from the field study (Task 2). The analysis of the primary and secondary data led to the identification and mapping of sector boundaries, employment and industrial relations trends within the boundaries of available information.

The data analysis consisted of three phases. The first phase was to uncover potential patterns; the second phase linked the findings with the literature and data review; and the third phase provided an analytical aggregation. It is only in the third phase that we obtained all results from the field study and, thus, were able to integrate them into the analysis. The phases are described in more detail below.

Phase 1 - Uncover patterns: The first phase identified patterns in the views and attitudes collected using the interviews and case studies. This part of the analysis particularly focused on finding patterns in the qualitative questions. Here, the analysis focused on potential similarities/differences between sectors and/or countries.

Phase 2 - Link with literature and available results from field study: The second phase aims to link the results of phase 1 with the results obtained from the data and literature review. One could for example argue that effects, which have been found in both the data and literature review as well as in the field study (or confirmed herein), would have a more solid foundation for a conclusive recommendation.

Phase 3 - Analytical aggregation, where all results from the field study were available: The third phase looked to aggregate the attitudes that were described in the first phase. The aim was to produce a single picture of the trends within employment and industrial relations along with definitions of the boundaries of the sector. The analytical aggregation addressed the sub-questions. Based on this third phase, we prepared the overall study conclusions and recommendations.

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3 Country case studies

This appendix presents the country case studies. The criteria for selecting the country case studies were presented in Appendix 2.

The country case studies are based on desk research and interviews with selected stakeholders in the countries (see list of stakeholders interviewed in Appendix 2). Moreover, the country case studies have been discussed and validated by national experts in some countries. Some country cases are more elaborated than others due to varying availability of data and access to experts in the countries. The country case studies are therefore similar in structure and content but not identical.

Each country case study contains a sub-section on the boundaries of the telecommunications and ICT sectors (including economic activities), employment and working conditions and industrial relations.

3.1 Denmark

3.1.1 Boundaries of the telecommunications and ICT sectors

In Denmark the telecommunications sector was traditionally characterised by public companies with regional monopoly on telecommunications services. In 1990, three Danish regional companies were merged into one company, Tele Danmark. Tele Danmark had a monopoly on telecommunications until 1996, when the market was liberalised and foreign telephone companies started to enter the Danish market. This development has accelerated ever since and today, there are 137 telephone companies in Denmark.

Following the general technological development in ICT over the last 10-15 years, broader ICT activities have gained space in the sector. Consequently, information-sharing activities, computer programming and consultancy have become an integral part of the telecommunications and ICT sectors in Denmark.

The sector can be described on the basis of a recent study mapping the telecommunications and ICT sectors. The study by Berlingske Research and eStatistik[2] uses a broad definition of what is to be included in the Danish telecommunications and ICT sectors. The study characterises the telecommunications and ICT sectors by the following range of activities and companies:

- telephone companies, such as TDC, Telenor Danmark Holding, TeliaSonera Danmark, Hi3G Denmark, and Tele Greenland

- telephone and communication equipment manufacturers, such as Nokia Danmark, Thrane & Thrane, GN Netcom, and Ericsson Danmark

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[2] Analyse af it-sektoren 2013, Berlingske Reseach & eStatistik.

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- software and IT service companies, such as IBM Denmark, CSC Danmark, NNIT, SimCorp, Skandinavisk Data Center, SAP Danmark, Microsoft Danmark, Nordic Processor, and SAS Institute

- computer and consumer electronics manufacturers, such as Bang & Olufsen, Arrow ECS Danmark, Tech Data Danmark, Despec Nordic Holding, Sony Nordic, and Juhl Bach Holding

- other electronics manufacturers, such as Foss, Kamstrup, Brüel & Kjær Sound & Vibration Measurement, Arrow Danmark, and Toke Foss Holding.

This broad range of companies shows that the Danish telecommunications and ICT sectors include a wide spectrum of ICT-related activities. These can overlap with other industries, for example in the case of consumer electronics manufacturing. The Danish telecommunications and ICT sectors are mainly understood to cover activities related to the above listed industries.

Interviewees also pointed out that the definition of the Danish telecommunications and ICT sectors include manufacturing and trade industries, as well as the digital companies related to digital agencies. According to the respondents, the definition should also cover commercial advertising businesses.

Interviewees argue for a definition of the telecommunications and ICT sectors to be more in line with the broad OECD definition (see chapter 2 in the main report) than with the narrower NACE definition. They also prefer the OECD definition over that of the International Telecommunication Union (ITU), as the latter mostly considers the communication side and is too technology driven.

Interviewees have more or less the same opinions about the development in the sector.[3] They agree that the overlapping areas of telecommunications and ICT represent an increasing share of the activity within the sector as such. One interviewee refers to software programming (including small sectors such as gaming) and consulting as the growth areas driven by a high degree of innovation. Though some companies are becoming more specialised, there are also tendencies of convergence, as companies become more dependent on each other. The interviewees also see convergence in that the large telecommunications companies include a still higher degree of content delivery. Similarly, they see convergence with some parts of consumer electronics where companies also include software development. Still, the interviewees all see the sectors as somewhat heterogeneous with different trends in the individual subsectors, such as more specialisation or a higher degree of convergence.

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[3] Based on findings of stakeholder interviews.

Economic activity in the sectors

As illustrated by Eurostat data below, the yearly turnover for the companies in the sectors in Denmark has remained fairly stable at a level of EUR 25 billion in the period from 2008 to 2012.[4]

At the level of subsectors by NACE codes, no clear trends can be identified during this period. The financial crisis in 2008 led to a reduction in the turnover of all sectors in 2009, while the individual subsectors experienced minor increases or decreases in turnover.

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[4] Excluding sector 26.80 where data are not available for 2012 and sector 26.20 where data are not available for 2008, the development shows a decrease of approximately 3%.

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Table 3-1   Yearly turnover, 2008-2012 – million EUR, adjusted for inflation by HICP (2011=100)

	2008	2009	2010	2011	2012
2611 - Manufacture of electronic components	165	227	171	196	205
2612 - Manufacture of loaded electronic boards	267	190	173	182	166
2630 - Manufacture of communication equipment		412	384	376	348
2640 - Manufacture of consumer electronics			433	416	
2680 - Manufacture of magnetic and optical media	2		2	3	
4651 - Wholesale of computers, computer peripheral equipment and software	4,989	4,774	5,272	5,030	5,249
4652 - Wholesale of electronic and telecommunications equipment and parts	2,281	2,062	2,450	2,143	2,186
5821 - Publishing of computer games	67	49	61	33	41
5829 - Other software publishing	555	485	494	596	490
61 - Telecommunications	6,860	6,675	6,585	6,361	6,084
62 - Computer programming, consultancy and related activities	9,116	9,124	9,095	9,022	9,051
631 - Data processing, hosting and related activities; web portals	666	536	636	834	769
8220 - Activities of call centres	123	130	167	163	161
951 - Repair of computers and communication equipment	113	115	112	102	128
	25,204	**24,780**	**26,035**	**25,454**	**24,878**

Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2).[5]

Table 3-1 above illustrates the yearly turnover from 2008-2012 in all sectors and this is aggregated at sub-sector level in Figure 3-1 below. It should be noted that data gaps mainly for manufacture of consumer electronics – code 26.40 – means that the manufacturing sector is underestimated.

Figure 3-1   Yearly turnover in subsectors, 2008-2012 – million EUR, adjusted for inflation by HICP (2011=100)

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[5] In 2008, data are not available for 26.30 and 26.40. In 2009 and 2012, data are not available for 26.40 and 26.80.

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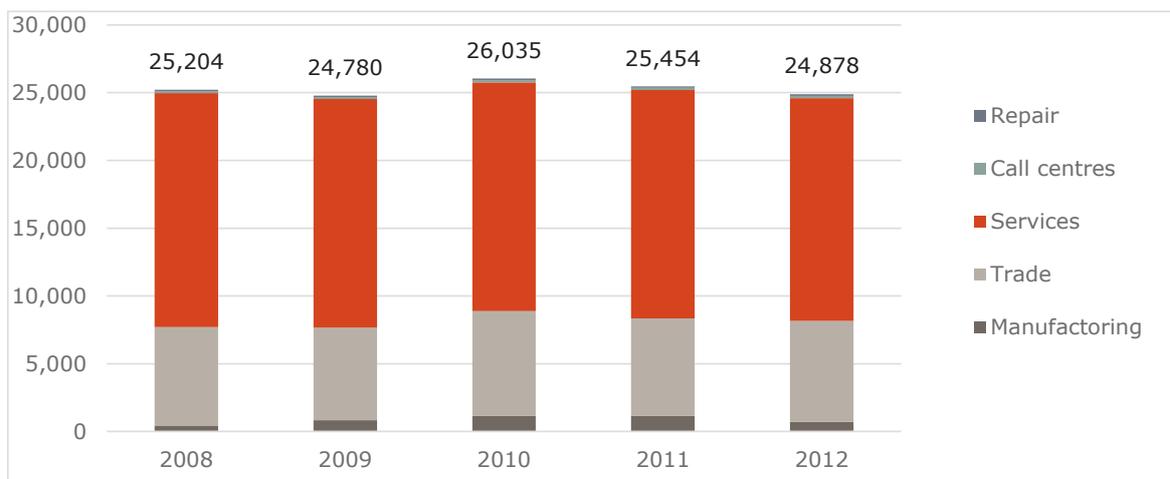
Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2).

Note: In 2008, data are not available for 26.30 and 26.40. In 2009 and 2012, data are not available for 26.40 and 26.80.

The largest decrease in turnover is found in the manufacturing sector, where the turnover fell by 14% when excluding 26.30 and 26.40 where data is not available. Similarly, the turnover in the service sector has decreased. On the other hand, the turnover increased in both the call centre sector (31%) and in the repair sector (14%).

Data on the average turnover per employee are only available for the telecommunications and computer programming, consultancy and related activities due to missing data on number of employees (see the section below on the number of employees). Existing data from 2011 suggest that the turnover per employee in telecommunications is around EUR 340,000 per year, compared to EUR 424,000 per person per year in Denmark.[6] For the employees in computer programming, consultancy and related activities, the turnover per employee is around EUR 150,000 in 2011 and thus at the same level as the average in Denmark, which is around EUR 155,000 per year.[7]

According to Table 3-2, the total number of companies in all of the sectors combined, increased by 20% in the period 2008 to 2012. This is quite a rapid growth, given that the general number of companies in Denmark decreased by 3% in the same period.[8]

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6 Eurostat, Structural Business Statistics
7 Eurostat, Structural Business Statistics

8 Source: Statistics Denmark, Total number of companies in Denmark (General Firmastatistik).

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Table 3-2   Number of companies, 2008-2012

	2008	2009	2010	2011	2012
2611 - Manufacture of electronic components	70	70	66	67	69
2612 - Manufacture of loaded electronic boards	24	23	21	25	24
2630 - Manufacture of communication equipment	117	111	109	104	103
2640 - Manufacture of consumer electronics	51	51	50	53	59
2680 - Manufacture of magnetic and optical media	6	5	5	4	3
4651 - Wholesale of computers, computer peripheral equipment and software	758	705	705	687	672
4652 - Wholesale of electronic and telecommunications equipment and parts	381	376	388	381	397
5821 - Publishing of computer games	22	19	26	32	47
5829 - Other software publishing	204	245	284	326	356
61 - Telecommunications	344	353	364	373	388
62 - Computer programming, consultancy and related activities	7,888	7,956	8,686	9,309	9,513
631 - Data processing, hosting and related activities; web portals	646	670	739	826	885
8220 - Activities of call centres	73	100	111	121	129
951 - Repair of computers and communication equipment	73	169	165	168	179
	10,657	**10,853**	**11,719**	**12,476**	**12,824**

Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2).

Looking across subsectors, there are large differences, as can be seen from both Table 3-2 and Figure 3-2.

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Figure 3-2   Number of companies in Denmark 2008-2012, per sub-sector
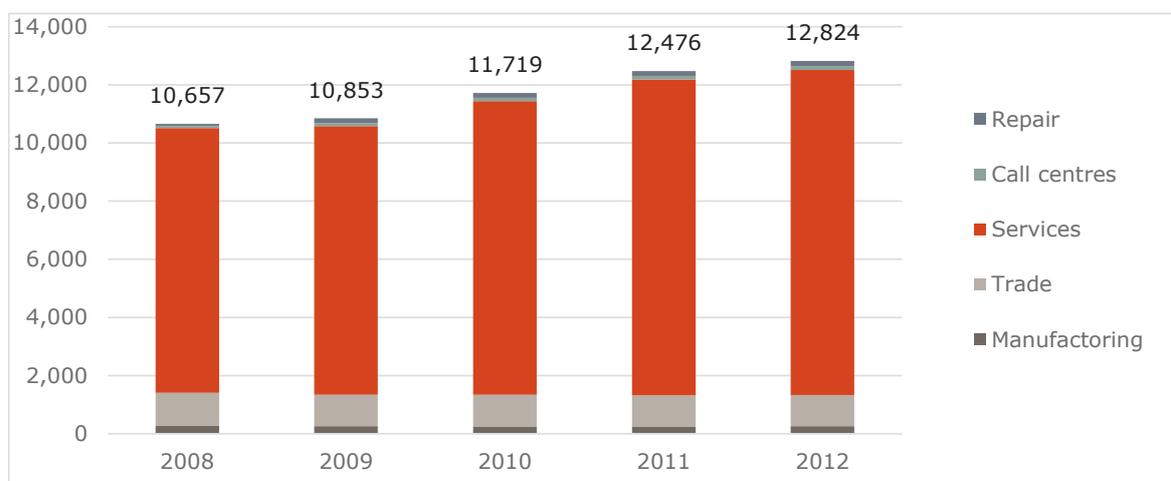
Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2).

While the number of companies has decreased in the manufacturing and trade sectors, it has increased in the other sub-sectors. The sub-sector showing the largest increase in number of companies is the repair sector with an increase of 145% and the call centres sector with an increase of approximately 77%. It should be noted, however, that the number of companies in this subsector in 2012 was still relatively low (179 and 129 respectively).

Data on the average number of employees per company suggest that companies in the telecommunications sector are quite large (50 employees on average) while companies in the ICT sector are quite small (7 employees on average). In comparison, the average number of employees in Denmark per company is between 15 and 20.

The study by Berlingske Research and eStatistik of the 88 biggest ICT companies in Denmark suggests that structural development overtime within sub-sectors has varied quite a bit[9], which is also confirmed by data from the European Labour Force Survey. The study draws a picture of a dynamic ICT sector that continuously lies ahead of other private business activities regarding entrepreneurial activity, innovation and education level.[10] The mapping shows that the sector has evolved into one where productivity, employment and value added have moved from the ICT industry and trade to ICT service and consultancy companies. Therefore, the IT service sub-sector has performed significantly better than most other private business industries with regard to turnover, employment and value added. The interviewees confirm this assessment of the industry, where segments of IT service and consultancy are those experiencing growth.

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[9] Analyse af it-sektoren 2013, Berlingske Reseach & eStatistik
[10] Analyse af it-sektoren 2013, Berlingske Reseach & eStatistik.

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3.1.2 Employment and working conditions

Employment data for Denmark include only figures for the service sectors. Telecommunications and computer programming, consultancy and other related activities are the main sub-sectors and, together, they employ about 73,000 people.

Table 3-3   Number of employed persons, 1,000 persons

	2008	**2009**	**2010**	**2011**	**2012**
262 - Manufacture of computers	-	-	-	-	-
263 - Manufacture of communication equipment	-	-	-	-	-
264 - Manufacture of consumer electronics	-	-	-	-	-
268 - Manufacture of magnetic and optical media					
61 - Telecommunications	17	17	18	15	13
62 - Computer programming, consultancy and related activities	56	57	57	58	60
631 - Data processing, hosting and related activities; web portals	-	-	-	-	-
951 - Repair of computers and communication equipment	-	-	-	-	-
Total	**73**	**74**	**76**	**73**	**73**

Source: European Labour Force Survey.

Employment in telecommunications decreased in the period while it increased in the other service sub-sectors. The number of companies in computer programming, consultancy and related activities increased as is reflected by the number of persons employed.

The majority of the employees work full time as illustrated in the Table 3- below. There is no clear trend in the split between full-time and part-time jobs.

Table 3-4   Distribution on full-time and part-time jobs – includes only 61 and 62

Full time and part time	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Full-time job	67	67	68	64	65	67
Part-time job	6	7	8	8	8	7
Grand total	73	74	76	73	73	75

Source: European Labour Force Survey.

Apart from telecommunications, the educational level in the service sectors is characterised by a significantly higher proportion of employed persons with higher education. This is illustrated in Table 3- below, which shows that 54% of employees in computer programming, consultancy and related activities have a high education compared with 33% in the telecommunications sector and 34% for all industries.

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Table 3-5   Distribution on education level – includes only 61 and 62

	61 - Telecommunications	62 - computer programming, consultancy and related activities	All employed workers
1.Low	21%	7%	22%
2.Medium	45%	34%	42%
3.High	33%	54%	34%
No answer	1%	5%	3%
Total	100%	100%	100%

Source: European Labour Force Survey.

Note: The education levels are defined according to the ISCED definition, where "Low" corresponds to ISCED levels 0-2, "Medium" corresponds to levels 3-4 and "High" corresponds to levels 5-8.

The time series from 2008 to 2013 from the European Labour Force Survey indicates that the share of employed persons with higher education is increasing[11]

The working conditions in the sectors are described by means of data on average weekly working hours, results of a study on the working conditions in the sectors and interview results.

Data on weekly working hours suggest that the working hours in computer programming, consultancy and related activities (NACE 62) are higher than in the telecommunications sector and higher than the average number of 33 hours for all industries in Denmark (based on the Labour Force Survey data).[12] In computer programming, consultancy and related activities more than 20% of the employees work more than 40 hours per week in 2013.

Table 3-6   Distribution on weekly working hours for 61 - telecommunications

	2008	2009	2010	2011	2012	2013
01 to 19	5%	6%	7%	7%	7%	8%
20 to 29	2%	2%	4%	3%	2%	2%
30 to 39	84%	84%	83%	86%	87%	83%
40 to 49	6%	8%	4%	3%	3%	5%
50+	3%	1%	2%	1%	1%	2%
Hours vary	0%	0%	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: European Labour Force Survey.

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11 European Labour Force Survey, data available for sub sector 61 and 62.
[12] Source: Eurostat (2013)

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Table 3-7   *Distribution on weekly working hours for 62 - computer programming, consultancy and related activities*

	2008	2009	2010	2011	2012	2013
01 to 19	4%	4%	5%	6%	5%	5%
20 to 29	2%	2%	1%	2%	4%	3%
30 to 39	73%	73%	74%	71%	73%	71%
40 to 49	14%	12%	12%	11%	13%	13%
50+	6%	9%	8%	9%	6%	9%
Hours vary	0%	0%	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: European Labour Force Survey.

A recent assessment of the psychological working conditions in the telecommunications and ICT sectors provides a basis for highlighting some of the characteristics of working conditions in the sectors.[13] There is an understanding of the ICT sector as being network-based and globally oriented, since it is a fast-evolving sector that looks towards the future. After the crisis in the early 2000s, however, it has also been recognised that the psychological working environment can be quite challenging. They are relatively privileged sectors with learning and development potentials, committed employees, relatively high wages and also strong union organisation.[14]

The average size of ICT companies has increased significantly during the past decade, and the share of SMEs (companies with ten employees or less) has fallen. The sector is now characterised by a number of large companies with production activities in many countries. As a result, expectations and requirements have become higher in terms of documentation and standardisation in these firms in order to enhance control, communication and overview. Furthermore, the demand has shifted from highly specialized technical competences in programming towards employees with skills in standard programmes and software and the capability to tailor solutions based on standard programmes to customer needs. Employees experience that the development toward a more standardised approach is experienced as a deterioration of working conditions.

Working hours are generally long and can vary considerably, depending on the project on which the employee is working. The work can be carried out anywhere, be it in the office, at home, or at the client's premises. These rather porous conditions can also be found in the organisational boundaries. Organisations undergo constant changes, which often require employees to work in different organisational set-ups at the same time. The ICT sector in Denmark is largely project-based, which entails high demands and pressure, especially before deadlines. It is also a highly competitive sector with internationalisation of production and services, meaning that finding someone capable

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[13] Psykisk arbejdsmiljø mellem standardisering og selvledelse, Center for Arbejdslivsforskning, Roskilde Universitet, Maj 2014.
[14] Psykisk arbejdsmiljø mellem standardisering og selvledelse, Center for Arbejdslivsforskning, Roskilde Universitet, Maj 2014.

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of delivering the same product faster and cheaper elsewhere always seems to be a possibility.

In the Danish context, the current development of the sectors poses a challenge to the following components of the psychological working environment: influence learning possibilities and professional development, workload and (un)predictability.[15]

The interviewee from the trade union confirmed most of the above points. The working conditions are characterised by high level and a fast pace of technological changes, which demand both great flexibility and creates uncertainty about the future job situation, but also offers career opportunities. The increasing demand for qualified staff means fewer jobs for the less educated as illustrated in the above tables, and this affects those working in manual or routine jobs.

3.1.3   Industrial relations

Similar to most industrial relations systems, there are three main actors in the Danish labour market: employers, employees, and the state – however, the role of the state in the Danish industrial relations system is limited. This is in Denmark referred to as the Danish model where the majority of industrial relations are defined and agreed on during negotiations and bargaining between the employers and the employees.

The parties enter into agreements on labour market conditions through collective bargaining. Collective bargaining comprises almost the entire workforce and establishes among other things the minimum wage, the working time, the conditions for maternity leave and occupational pension schemes.[16]

Collective bargaining and social dialogue
The Danish market is primarily based on agreements between employers and employees. Collective bargaining is important for the majority of the labour market. It can be divided into four categories: main agreements ("*hovedaftaler*"), country-wide collective bargaining ("*landsdækkende overenskomster*"), local collective bargaining ("*lokale overenskomster*") and so-called usages ("*kutymer*").

Collective bargaining is the main cornerstone in the work of the labour market's social partners. This is where wage and employment conditions for most Danish workers are established.

It has traditionally been difficult to include the Danish IT sector in one single collective bargaining agreement, as each trade union would negotiate their own agreement. In 2014, however, the IT company CGI Danmark reached one collective bargaining agreement[17] that can pave the way for the whole sector. The agreement was

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[15] Psykisk arbejdsmiljø mellem standardisering og selvledelse, Center for Arbejdslivsforskning, Roskilde Universitet, Maj 2014
[16] Uddannelsesguide, Udenrigsministeriet, 2014.
https://www.ug.dk/job/artikleromjobogarbm/omarbejdsmarkedet/arbejdsogansaettelsesvilkaar/overenskomster-og-aftaler.
[17] IT, medie & industri nr. 4 2014, HK
http://www.hk.dk/~/media/Dokumenter/Afdelinger/Hovedstaden/IMI/Blade/HK_IMI_0414_web.ashx.

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established as a partnership among the company and several trade unions, namely HK/Privat, PROSA, IDA, Djøf and Magistrene.

Collective bargaining describes the working conditions within an area of work. In both the telecommunications and ICT sectors, agreements between an employer organisation and a trade union typically include decisions about:

- job titles
- working time
- salary
- employment agreements
- illness
- occupational injuries
- periods of notice
- education/training rights.[18]

The social dialogue in Denmark is unique in the sense that it represents a form of highly autonomous bipartite cross-industry dialogue. Here, it is not legislation, but national social partner organisations that lay down many of the procedural rules for collective bargaining and other industrial relations issues through "basic agreements".

The Danish system has traditionally been clearly divided between the areas of competence of the social partners and those of the public authorities. Consequently, there has been little scope for tripartite institutions, whereas bipartite dialogue has played a key role. However, this dividing line has been somewhat blurred in recent years with an increasing tendency towards tripartite cooperation on particular issues[19].

3.1.4   Summary

The country case study shows that the Danish telecommunications and ICT sectors include a wide spectrum of ICT-related activities, which can overlap with other industries. Interviewees argue in favour of a definition of the telecommunications and ICT sectors in line with the OECD definition.

Looking at the economic activities of the sector, there is a tendency towards growth in employment and turnover in the ICT service sector. In terms of size of the sectors there is a tendency towards growth in the ICT sector and decrease in the telecommunications sector.

There is an understanding of the ICT sector as being network based and globally oriented, since it is a fast-evolving and future-oriented sector. However, it has also

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[18] 3F, http://www.3f.dk/gops/overenskomst-_-hvorfor-det_/overenskomstforhandlinger.
[19] Social Dialogue, Social Europe guide volume 2, European Commission Directorate-General for Employment, Social affairs and Inclusion, Manuscript completed in January 2012, ISSN 1977-2343.

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been recognised that the psychological working environment can be quite challenging. That being said it is a relatively privileged sector with learning and development potentials, committed employees, relatively high wages and also a strong union organisation.

In the telecommunications sector, the number of companies has increased, but employment has decreased and the percentage of highly educated workers is lower than in ICT service sector.

Collective bargaining is the main cornerstone in the work of the labour market's social partners. This is where wage and employment conditions for most of the Danish workers are established.

3.2 France

3.2.1 Boundaries of the telecommunications and ICT sectors

The telecommunications and ICT sectors in France cover the following segments: manufacturing of telecommunications equipment, commercialisation of networks and telecommunications services, manufacturing of informatics equipment and electronics for professional use, the conception and editing of software and IT services, manufacturing of electronic equipment for the general public, and manufacturing of components. To a large extend this is coherent with the OECD definition.

At the end of the 1990s, the telecommunications sector in France counted 67 licensed operators, which were either leasing infrastructures or providing telephone services to the public or both. In addition to these 67 operators, the French market also comprises 1,530 companies, whose main activities are telecommunications services Internet access providers, commercialisation of services firms, etc.[20]. Among the individually licensed operators, the market distinguishes between landline and mobile operators. The non-licensed companies can be classified into five categories: Internet access providers ("*Fournisseurs d'Accès à Internet*"), data transporters ("*transporteurs de données*"), telephone card providers ("*fournisseurs de cartes téléphoniques*"), commercialisation of service companies ("*sociétés de commercialisation de services*") and other companies also declaring having their main activity in the telecommunications sector.[21] The ICT sector is based on the French classification by activity (Nomenclature d'Activités Française, NAF) which incorporates all the levels of the NACE Rev.1 with the addition of one national level. It can be broken down at the last level of the NACE classes in order to take into account the national specificities.

In terms of sector boundaries and definitions, the interviewees agree that the OECD definition describes the sector in the best way, and that it is in alignment with the French Digital Economy definition. They also question whether call centres should be

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[20] ARCEP. Le marché des services de télécommunications en France en 1998, Autorité de Régulation des Communications Électroniques et des Postes.
[21] ARCEP. Le marché des services de télécommunications en France en 1998, Autorité de Régulation des Communications Électroniques et des Postes.

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part of the sector definition - the argument being that call centres are more singular regarding work organisation and other work-related issues. Call centres are also much more customer oriented. The interviewees agreed that the overlap between the telecommunications and the ITC sectors account for an increasing part of the activity within the sectors.

Economic activity in the sectors

Table 3-2 shows that the **number of companies** in the telecommunications and ICT sectors is only available in France for the years 2008-2011. Furthermore, 2008 data is not available for a range of sectors. The total number of companies increased from 72,613 in 2008 to 95,967 in 2011. Looking only at the sectors, where data are available for both 2008 and 2011, the number of telecommunications and ICT companies in 2012 was 92,130 (corresponding to 27% of the total number of companies). In general, the number of companies[22] in France has increased by 9% since 2008.

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[22] Total business economy; repair of computers, personal and household goods; except financial and insurance activities.

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Table 3-2   Number of companies in France, 2008-2012

	2008	2009	2010	2011
2611 - Manufacture of electronic components	:	302	436	340
2612 - Manufacture of loaded electronic boards	:	638	551	576
2630 - Manufacture of communication equipment	683	545	354	285
2640 - Manufacture of consumer electronics	163	124	192	199
2680 - Manufacture of magnetic and optical media	12	21	16	18
4651 - Wholesale of computers, computer peripheral equipment and software	:	3,855	3,014	2,759
4652 - Wholesale of electronic and telecommunications equipment and parts	2,578	2,268	2,396	2,942
5821 - Publishing of computer games	:	149	192	162
5829 - Other software publishing	4,397	4,413	4,899	4,221
61 – Telecommunications	4,292	4,746	4,936	4,796
62 - Computer programming, consultancy and related activities	42,062	38,533	58,687	58,721
631 - Data processing, hosting and related activities; web portals	8,528	6,201	8,427	8,594
8220 - Activities of call centres	1,141	984	1,443	1,540
951 - Repair of computers and communication equipment	8,757	7,771	10,900	10,814
Total	**72,613**	**70,550**	**96,443**	**95,967**

Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2).

Note: 2008 data are not available for 26.11, 26.12, 46.51 and 58.21.

By far the largest number of companies fall under 62, computer programming, consultancy and related activities, which in 2011 accounted for about 60% of all the companies in the sector. This sector has also seen the largest increase in the absolute number of companies – from around 42,000 in 2008 to almost 59,000 in 2010.

Looking across subsectors, a number of major differences can be identified as presented in the Figure 3-3.

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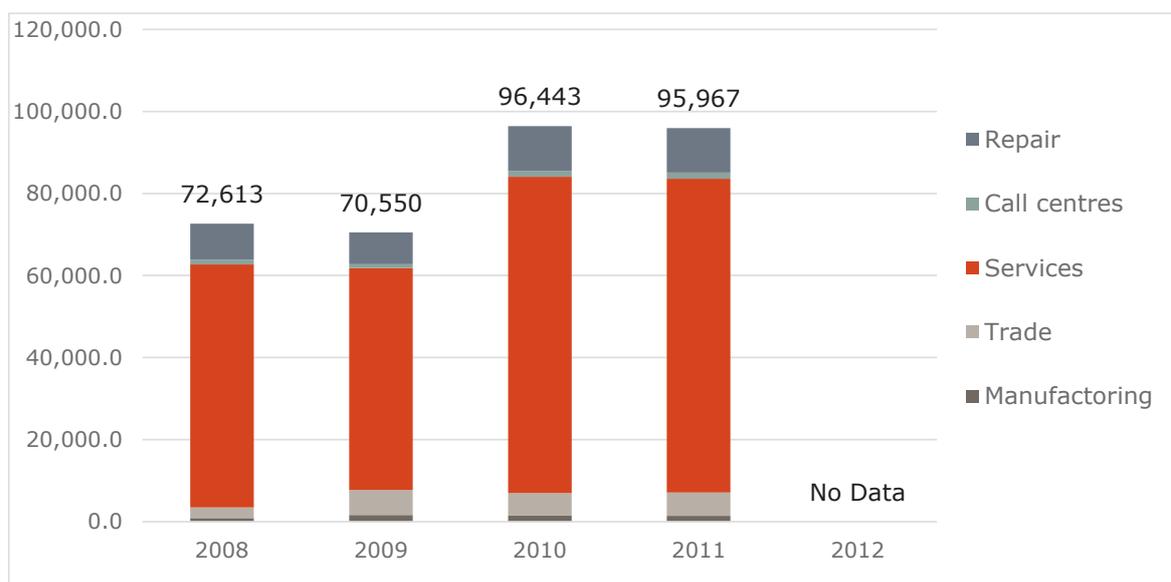*Figure 3-3   Number of companies in France, 2008-2012, sub-sectors*

Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2).

Note: 2008 data are not available for 26.11, 26.12, 46.51 and 58.21.

Looking only at the sectors where data are available for both 2008 and 2011, the data show that the number of companies in the manufacturing subsector decreased by 41% from 2008 to 2011. In the same period, the other subsectors saw an increase in the number of companies. The largest increase is found in the call centres sector (35%), but the services sector (29%) and the repair sector (23%) also experienced large increases in the number of companies.

The annual turnover[23] of the companies in the telecommunications and ICT sectors is available for the years 2008-2011.[24] The total turnover in these sectors in 2008 was EUR 167,426 million and EUR 208,869 million respectively, cf. Table 3-3. However, data are missing for four sectors in 2008 and in one sector in 2011. Looking only at the sectors where data are available for both 2008 and 2011, the number of companies in these sectors increased from 167,410 in 2008 to 170,990 in 2011. Hence, the number of companies increased by around 2%. In comparison, the total business sector turnover decreased by 3% in the same period.

In 2011, companies producing goods and services in the ICT sector, comprising IT, internet and electronic communication, generated a turnover of EUR 100 billion, corresponding to about 5% of the French GDP.[25]

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[23] Adjusted for inflation by HICP (Harmonised indices of consumer prices), base year is 2011.
[24] Data for some sectors are available for 2012, but not sufficiently comprehensive for use in this study.
[25] Les chiffres clé des communications électroniques en France (Chiffres 2011), République Francaise, Juin 2012 – ARCEP (Autorité de régulation des communications électroniques de postes).

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Table 3-3   *Annual turnover, 2008–2011 – million EUR, adjusted for inflation by HICP (2011=100)*

	2008	2009	2010	2011
2611 - Manufacture of electronic components		5,011.0	6,348.1	5,778.5
2612 - Manufacture of loaded electronic boards		4,141.1	4,438.4	4,465.0
2630 - Manufacture of communication equipment	10,337.1	7,435.4	7,459.1	7,299.1
2640 - Manufacture of consumer electronics	3,314.5	301.5	326.2	487.4
2680 - Manufacture of magnetic and optical media	15.7	24.8	14.3	:
4651 - Wholesale of computers, computer peripheral equipment and software		30,413.2	28,931.0	26,403.9
4652 - Wholesale of electronic and telecommunications equipment and parts	15,046.3	13,376.7	14,375.8	17,184.1
5821 - Publishing of computer games		693.4	1,233.9	1,231.6
5829 - Other software publishing	7,664.1	8,039.9	8,087.7	7,763.4
61 - Telecommunications	69,545.5	70,020.1	72,102.4	70,584.7
62 - Computer programming, consultancy and related activities	45,966.4	44,785.4	49,356.5	52,003.5
631 - Data processing, hosting and related activities; web portals	7,717.8	7,827.9	6,853.5	6,965.3
8220 - Activities of call centres	2,527.6	2,440.7	2,939.8	2,820.2
951 - Repair of computers and communication equipment	5,291.0	5,292.9	5,293.0	5,881.9
Total	**167,426**	**199,804**	**207,760**	**208,869**

Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2), Harmonized indices of consumer prices (HICP) (t_prc_hicp) and COWI.

Note: *In 2008, data are not available for 26.11, 26.12, 46.51 and 58.21 and in 2011, data are not available for 26.80.*

Looking across subsectors, large differences can be found as presented in Figure 3-4.

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Figure 3-4   Annual turnover – subsectors, 2008–2011 – million EUR, adjusted for inflation by HICP (2011=100)
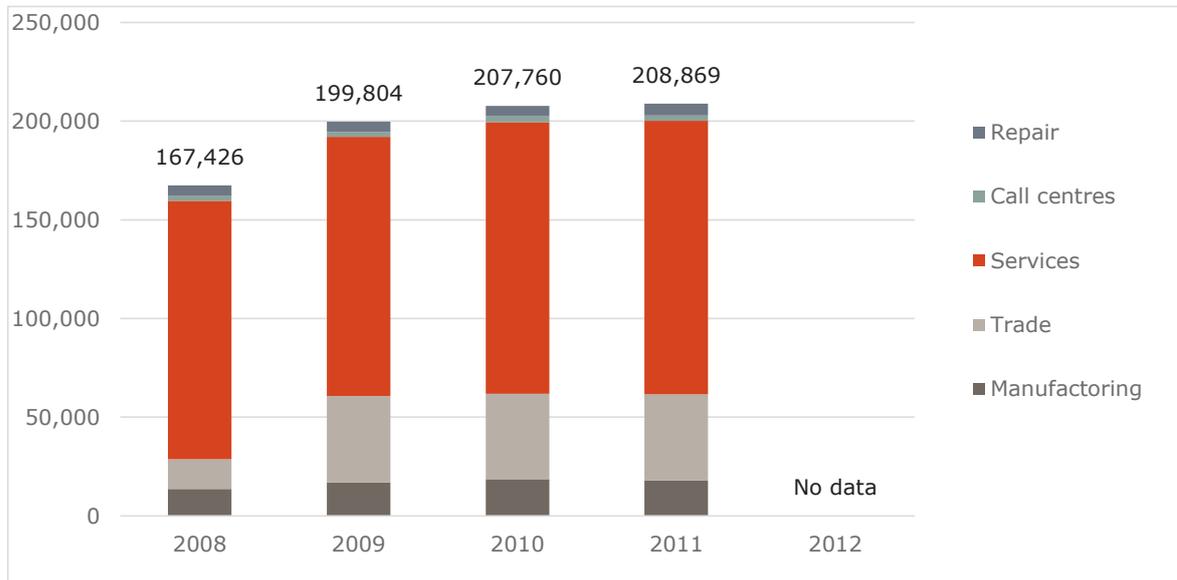
Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2), Harmonized indices of consumer prices (HICP) (t_prc_hicp) and COWI

Note: In 2008, data are not available for 26.11, 26.12, 46.51 and 58.21 and in 2011 data are not available for 26.80

Looking only at the sectors where data are available for both 2008 and 2011, data show that the turnover in the subsector manufacturing decreased by 43%, while the turnover increased in the other subsectors. The largest increase in turnover is found in the trade sector (14%) and in the call centres sector (12%).

Besides call centres, all subsectors in France have a higher turnover per employee than the average in France. The largest turnover can be found in telecommunications with around EUR 500,000 per employee per year, which is around 3.5 times higher than the average for all employees in France.

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3.2.2   Employment and working conditions

Since 1995, employment in the ICT sector has been increasing in France at a much higher rate than the average national employment rate. In 1998, employment in the ICT sector grew by 8.6% compared to 1997, while the average employment growth was only 1.2%.[26] According to the OECD, in 2006, France was one of the European countries with the highest number of people employed in the ICT sector, with 547,328 ICT workers. The United Kingdom employed 258,831 ICT workers and Spain employed 232,966 workers.[27]

The data from the European Labour Force survey describe the development in the number of employees.

In France, the average number of employees in companies is around ten when looking across all companies. Three subsectors are characterized by a large number of employees per company on average; manufacturing of communication equipment (around 60 employees), telecommunications (around 30 employees) and call centres (around 25 employees). The rest of the sectors have, on average, a smaller number of employees per company compared with all companies in France.

The main trend is a significant decrease in the number of full-time employed persons in the telecommunications sector and an increase in the computer programming, consultancy and related activities sectors. Employment in call centres has also increased.

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[26] Eurofound. http://www.eurofound.europa.eu/eiro/2001/08/study/tn0108199s.htm.
[27] UNI Europa 2009. http://www.uniglobalunion.org/sites/default/files/attachments/pdf/Dublin_Report%20Final-fr.pdf.

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Table 3-4   Number of full-time employees, 2008–2013, 1,000 persons

	2008	2009	2010	2011	2012	2013
262 - Manufacture of computers	6	6	12	15	9	8
263 - Manufacture of communication equipment	36	23	26	19	18	17
264 - Manufacture of consumer electronics	1	3	2	2	1	1
268 - Manufacture of magnetic and optical media	-	-	-	1	0	-
61 - Telecommunications	157	141	138	134	138	116
62 - Computer programming, consultancy and related activities	254	300	307	330	335	312
631 - Data processing, hosting and related activities; web portals	37	40	43	48	34	51
820 - Activities of call centres	26	32	32	43	43	38
951 - Repair of computers and communication equipment	20	20	19	21	20	21
Total	**535**	**565**	**579**	**612**	**598**	**564**

Source: European Labour Force Survey.

Regarding the level of education, most of the sectors employ staff with higher education levels than the national average in France. This is illustrated in Table 3-5.

Table 3-5   Distribution of employed persons by level of education and by sector - 2013

	Manufacturing	Services	Call centres	Repair	All employed workers
1. Low	7%	5%	13%	10%	20%
2. Medium	27%	24%	49%	30%	44%
3. High	66%	71%	38%	60%	36%
No answer	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%

Source: European Labour Force Survey.

Note: The education levels are defined according to the ISCED definition, where "Low" corresponds to ISCED levels 0-2, "Medium" corresponds to levels 3-4 and "High" corresponds to levels 5-8.

The employment of highly educated staff is more pronounced in the services sector. In the service sector, the computer programming, consultancy and related activities account for an even higher share of employed persons with high educations.

Table 3-6 illustrates this trend and also the trend towards having more professionals and fewer staff with low or medium levels of education. In computer programming, consultancy and related activities sector, 81% of the employed persons in 2013 had a high education compared to 77% in 2008.

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Table 3-6   *Distribution of employed by level of education in computer programming, consultancy and related activities (62) – 2008-2013*

	2008	**2009**	**2010**	**2011**	**2012**	**2013**
1.Low	4%	4%	4%	3%	4%	3%
2.Medium	19%	16%	13%	16%	15%	14%
3.High	77%	81%	83%	81%	81%	84%
No answer	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

Source: European Labour Force Survey.

Working conditions in the sector

In France, salaries vary considerably across the jobs in both sectors, as the telecommunications and ICT sectors include a vast range of jobs requiring very different levels of qualifications. While there is little specific information on salaries for all job levels in the telecommunications and ICT sectors, salaries of professionals are available. In the ICT sector, professionals can expect between EUR 35,000 and EUR 40,000 yearly before tax. In more technological disciplines, such as telecommunications and network functions, salaries range between EUR 30,000 and EUR 35,000 yearly before tax.[28]

Among the most widespread physical risks of working in the telecommunications sector in France is the one related to visual problems ("situations avec contraintes visuelles") as well as postures causing joint strain due to the long hours spent in front of a screen. Organisational risks are characteristically high for this sector and can all be related to high pressure and stress: yearly individual performance assessments, achieving specified goals, computer monitoring of work and performance, following strict quality procedures, exterior demands requiring immediate response, always being busy, etc.[29]

Both sectors have a system of counting the working hours of full-time employees by the day. In fact, they are the two sectors in France that make the most use of this by-the-day accounting method.[30] The majority of the employees in the telecommunications and ICT sector work between 35 and 36 hours a week (89.6%). Part-time workers constitute only a very small part of the telecommunications and ICT employees (approximately 8%) relative to the French average for companies of ten or more employees (around 16%), and these sectors also make relatively limited use of fixed-term contracts ("contrats à durée déterminée" or CDD).[31]

The European Labour Force Survey can provide a further description of the trends and the variations in weekly working time across subsectors.

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[28]http://www.zdnet.fr/actualites/tic-32500-euros-de-salaire-annuel-moyen-pour-les-cadres-francais-39370247.htm.
[29] http://travail-emploi.gouv.fr/IMG/pdf/Synthese_Stat_no_6_-_Risques_professionnels_par_secteur.pdf.
[30] http://travail-emploi.gouv.fr/IMG/pdf/2014-073.pdf.
[31]http://travail-emploi.gouv.fr/IMG/pdf/2014-073.pdf.

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Table 3-7   Distribution of employed by average weekly working time - 2013

Weekly working hours	Manufacturing	Services	Call centres	Repair
-19	0%	1%	0%	10%
20-29	0%	4%	4%	0%
30-39	57%	49%	87%	56%
40-49	33%	32%	8%	27%
50+	9%	14%	1%	7%
Hours vary	0%	0%	0%	0%

Source: European Labour Force Survey.

In the manufacturing and service sectors, the share of employees working more than 40 hours per week exceeds 40%.

The French government agency Anact (*Agence Nationale pour l'amélioration des conditions de travail*) analyses and seeks to ameliorate working conditions. As seen above, the telecommunications and ICT sectors in France are quite prone to stress, which led Anact to conduct an amelioration campaign in one of France's biggest telecommunications and ICT companies, France Télécom-Orange. It specifically intervened in areas of organisation of tasks and working time and dealt with the tension caused by the countervailing forces of, on the one hand, the client requires personalised service, and on the other hand, the market pushing for industrialisation of the service. These initiatives for better working conditions were taken in the context of a wave of suicides within France Télécom-Orange employees in 2008 during the financial crisis, which is evidence of the high level of stress and uncertainty in the sector at that time.

The French telecommunications industry is dominated by large firms employing 500 or more workers (44.6% of the persons employed in the sector work in these large companies). The next tier of telecommunication employees work in companies employing between 200 and 499 workers (28.1%) and 50 to 199 workers (19.5%). Only very few telecommunications employees work in SMEs (6% work in firms employing between ten and 49 workers and only 1.8% work in companies with less than nine people).[32] The majority of the persons employed in the telecommunications sector are relatively high-skilled and mostly men (61.6%).

In the ICT sector, on the other hand, the major part of its employees are working in SMEs, i.e. companies employing between ten and 49 workers (27.5%) and between 50 to 199 workers (26.8%). Employees working in larger firms, such as those employing between 200 and 499 workers, and over 500 workers, respectively comprise, 18% and 17.3% of the ICT workforce. Small firms with between one and nine employees constitute 10.4% of the ICT workforce. The French ICT sector is even more largely male-dominated than the telecommunications sector, with 75.3% men.

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[32] http://travail-emploi.gouv.fr/IMG/pdf/Synthese_Stat_no_6_-_Risques_professionnels_par_secteur.pdf.

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3.2.3   Industrial relations

In the French industrial relations system, the state is an actor on an equal footing with the employer and employee organisations, since it sets the framework for the social dialogue. Professional relations are established on inter-professional, branch and firm levels.

There are different types of trade unions in the French system. These can be formed in any company or organisation, and any trade union affiliated with a representative organisation at the national level is considered representative in the company.[33]

Collective bargaining and social dialogue
The bargaining of a convention or a company agreement makes it possible to adapt the rules of the labour code ("*Code du travail*") to the specificities and needs of the company. However, in order to facilitate bargaining in small firms lacking trade union representatives, an agreement can be reached under certain conditions by the elected representatives of employees in the work council ("*Comité d'entreprise*"). Bargaining can be mandatory, with set subjects and schedules, or free. In any case, company agreements are subject to certain validity conditions, and to the adherence to specific formalities.

In the telecommunications and ICT sectors, collective bargaining has a sectorial and company-level structure. A specific sectorial convention covers IT and engineering and consultancy firms, known as SYNTEC. There is a specific sectorial convention covering telecommunications, except for the (ever shrinking) group of employees of France Télécom, who still benefit from the status of civil servant ("*fonctionnaire*"), where employment and working conditions have been inherited from the past where France Telecom was a state monopoly. ICT manufacturing companies, for their part, are covered by the metallurgical sector's convention. Company conventions exist in different areas, as is the case at Cap Gemini and IBM.[34]

A large share of French employees in the ICT and telecom sectors are covered by collective bargaining: 100% of the workers in the telecommunication sector are covered, and 73% in the IT services sector. This coverage of the latter is ensured by the SYNTEC Convention.

In the past 15 years in France, unionization in companies of at least 20 employees has increased and diversified. The establishment of institutions representing employees, and particularly the designation of representative delegates, has been facilitated by intensifying company bargaining, especially in the area of working time reductions. When employees are unionised, practices and forms of engagement are more diversified. However, while trade union agreements are increasingly implemented in companies, employees are not increasingly unionised, despite their often positive opinion about trade unions.

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[33] http://travail-emploi.gouv.fr
[34] http://www.eurofound.europa.eu/eiro/2001/08/study/tn0108199s.htm.

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For the past 15 years, the part of unionized employees in the ICT sectors has shown a tendency towards stabilizing around 8%. Despite the small number of adherents, however, worker organisations are widely represented in workplaces, resulting in overall better coverage of the collective agreements. Their presence was even reinforced between 1996 and 2005. Over 40% of the employees in 2005 stated that a worker organisation is present at their workplace, of which over half within their company or administration.[35] For example, between 25% and 30% of the France-Télécom employees are members of a worker organisation.[36]

France is a country with a long tradition of social dialogue and collective bargaining negotiations. In the last decade, a significant event marking the development of social dialogue was the introduction of the Loi Larcher, or "Larcher Law", on 31 January 2007, which modernised the social dialogue procedure to increasingly include social partners in deliberations and developments of the law.[37] The trade unions and the employer organisations recognised as representatives at the national level (the same for decades) have negotiated a very important national agreement on competitiveness and employment, which provides more flexibility for companies and guarantees for employment.

The professional trade union for computer, telecommunications and digital professions ("Association professionnelle des Informaticiens")[38] handles topics such as minimum wages, employment and flexibility within the sector, professional training opportunities, professional equality (especially with regards to equal treatment for executives and non-executives) and partial unemployment ("*chômage partiel*") are often discussed in collective bargaining within these sectors[39].

Several interviewees, both from employee organisations and professional organisations, have mentioned the growing tendency of telecommunication and ICT companies to outsource services. This might become an increasingly important topic of collective bargaining in the future.

3.2.4   Summary

The segments covered by the telecommunications and ICT sectors in France are largely coherent with the OECD definition.

One prominent observation on the economic activity concerns the turnover of EUR 100 billion generated by companies producing goods and services in the ICT sector in 2011, corresponding to about 5% of the French GDP.[40] Also the significant decrease in the number of full-time employed persons in the telecommunications sector and the

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[35] Pour un dialogue social efficace et légitime: Représentativité et financement des organisations professionnelles et syndicales, Rapport au Premier ministre, mai 2006, www.ladocumentationfrancaise.fr/var/storage/rapports-publics/064000364/0000.pdf.
[36] Les syndicats français ont-ils besoin d'adhérents? Institut Supérieur du Travail, http://www.istravail.com/article309.html.
[37] http://www.eurofound.europa.eu/eiro/studies/tn1302018s/fr1302011q.htm.
[38] http://munci.org/+-Negociations-paritaires-Branche-Syntec-+.
[39] http://munci.org/+-Negociations-paritaires-Branche-Syntec-+.
[40] Les chiffres clé des communications électroniques en France (Chiffres 2011), République Francaise, Juin 2012 – ARCEP (Autorité de régulation des communications électroniques de postes).

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increase in the computer programming, consultancy and related activities sector is a relevant observation, which underlines the European tendency.

Pressure at work and stress are normally high in this sector and can all be related to yearly individual performance assessments, achieving specific goals, computer monitoring of work and performance, following strict quality procedures, exterior demands requiring immediate response and the feeling of always being busy.

3.3 Estonia

3.3.1 Boundaries of the Telecommunications and ICT sectors

The Estonian telecommunications sector was completely liberalised in January 2001, when the special monopoly rights of the Estonian Telephone Company ended. Over the last decade, the field of telecommunications has developed constantly and fast. While in the past, the main aim of Estonian communications operators was to provide telephone services, the trend is now towards offering service packages tailored to the needs of different customer groups. Ensuring the availability of the Internet has become important as it offers the opportunity of using many services online.

According to the survey by Statistics Estonia, the most important trends in the telecommunications sectors over the last years include replacement of the dial-up internet access by broadband; introduction of the mobile broadband, which is gaining popularity over the ordinary broadband services; increasing television transmission by cable network and IP-TV (the number of cable network customers increased as much as 80% in 2013 compared with 2012); and the decrease in the fixed voice services market, in contrast to the increase in the use of VoIP services. In 2014, the biggest Estonian telecommunications companies were Eesti Telecom, Elisa Eesti As, Fortumo OÜ, Top Connect OÜ, Tele2 Eesti and Viasat.

In addition, Estonia has undergone a very rapid development in the use of ICT solutions in businesses, state administration and everyday life. Rapid Wi-Fi internet connections are available in nearly 1,200 public places, and are mostly free of charge in trains and long distance buses. Estonia's internet usage is rather high. In 2014, 81.2% of households and 89% of enterprises had a broadband internet connection, and 75% of the enterprises had a company website[41]. In 2012, the Estonian IT Academy was established in order to improve the quality of ICT training and increase its international competitiveness. In 2014, the largest ICT companies were Playtech Estonia OÜ, Mobi Solutions OÜ and Nortal AS.

The development of public e-services and the uptake of these by individuals and companies have been significant. Estonia leads the way in the use of electronic authentication, digital signatures and e-voting. The Estonian national ICT policy has strongly supported the systematic development of the state information system and ensured its security (e.g. X-road, public key infrastructure and eID, the document

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[41] See: http://pub.stat.ee/px-web.2001/Database/Majandus/05INFOTEHNOLOOGIA/05INFOTEHNOLOOGIA.asp

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exchange centre, and the state portal eesti.ee). This widespread penetration of ICT solutions has demanded innovation and growth in the ICT sector. All large initiatives and most e-government developments in Estonia have been made in close co-operation with the private sector and relevant NGOs. All of this has created a reputation of Estonia as a leading e-country.

The definition of the telecommunications and ICT sectors used in Estonia is based on the OECD definition of the ICT sector[42]. The Estonian Statistical Office (Statistics Estonia) provides regular statistics on the ICT sector developments[43]. Hence, the ICT sector is divided into ICT services and ICT manufacturing. According to the NACE Rev. 2 classification, the following sectors are covered[44]:

- ICT manufacturing (261, 262, 263, 264 and 268), i.e. manufacturing activities, where products are designed for use in computing and communications, including transmission and display, or the use electronic processing of material phenomena, identifying, measuring and/or recording material phenomena, or managing physical processes.
- ICT services (465, 582, 61, 62, 631, 951), i.e. service activities, where products are designed to enable the function of information processing and communication by electronic means. The ICT services thus cover telecommunications, trade and advisory services.

According to the interviewees in the current study, the growth in the telecommunications and ICT sectors originates from the overlapping areas of telecommunications and ICT. For example, in banking sector, there is no need for tellers anymore as the automated teller machines or on-line banking terminals can carry out banking services. A good example here is also the merger of two biggest telecommunications companies, AS EMT and Elion Ettevõtted AS, with Eesti Telecom AS in September 2014. The aim of the merger was to become even more client-oriented and to offer both private and business customers the broadest package of high-quality telecommunications and IT services and solutions. In 2015, the company aims to continue the development of Internet and IT business segments and plan to launch new ICT services.

In addition, the interviewees stated that the economic activities of the telecommunications and ICT sectors are very heterogeneous. As pointed out by one interviewee:

"*First, ICT covers lots of different activities, which means that many different areas can intersect each other. Second, the competences are very different, which means that ICT has many different technical frameworks. Things can be combined in countless ways.*"

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[42] See: http://www.oecd.org/science/sci-tech/38217340.pdf.
[43] See: http://pub.stat.ee/px-web.2001/Database/Majandus/05Infotehnoloogia/01Info-_ja_kommunikatsioon/01Info-_ja_kommunikatsioon.asp.
[44] See: http://pub.stat.ee/px-web.2001/Database/Majandus/05Infotehnoloogia/01Info-_ja_kommunikatsioon/IT_51.htm.

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As pointed out by the interviewees the economic growth in different subsectors and megatrends in the telecommunications and ICT sectors, e-trade and logistics are going to grow even more in the future. Moreover, the division of work in the telecommunications and ICT sectors will change greatly. Classic corporations will be substituted by the systems, where employees are partners. Location loses its importance and global networks will emerge. The companies become more and more specialised, which means that an understanding of the telecommunications and ICT sectors as one common sector will be decreasing.

In addition to overlaps between the telecommunications and ICT sectors, recent studies have indicated that there are a number of overlaps between the ICT sector and other sectors in Estonia. In 2011, the number of ICT professionals in other industry sectors was approximately 9,000, which can be compared to the total employment of approximately 18,000 persons in the telecommunications and ICT sectors. The number of employees outside the telecommunications and ICT sectors, who work with ICT, is highest in the information and communication sector (18%; the sector does not include the ICT sector); followed by financial and insurance activities (8%), professional, scientific and technical fields (5%) and the energy sector (4%). In terms of absolute figures, the number of ICT professionals was highest in public administration, i.e. 1,182 employees. The sector with the second highest number is the manufacturing sector with 1,113 ICT professionals, followed by the professional, scientific and technical fields (1,031 ICT professionals), information and communication (940), and financial and insurance activities (795).

Economic activities in the sectors
Table 3-8 below shows the annual turnover in the telecommunications and ICT sectors for 2008-2012. For the telecommunications industry (61) and the service industries (62-951), data are available for all the years 2008-2012. For two manufacturing industries (2611 and 2612), there is nearly a complete time series. For the remaining industries, there are gaps in the time series. We have aggregated the industry data into a sector total by including only the manufacturing and service industries with complete or nearly complete time series. When calculated in this way, the annual turnover[45] for the companies increased by 2% from 2008 to 2011. At the same time, the total business sector turnover decreased by 4%, according to data obtained from the Structural Business Statistics. Hence, the turnover in the telecommunications and ICT sectors increased, while that of all sectors on average decreased.

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[45] Adjusted for inflation by HICP (Harmonized indices of consumer prices), base year is 2011.

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Table 3-8   Annual turnover – detailed industries, 2008–2012 – million EUR, adjusted for inflation by HICP (2011=100)

	2008	2009	2010	2011	2012
2611 - Manufacture of electronic components	197.9	133.8	154.6	197.4	
2612 - Manufacture of loaded electronic boards	26.4	23.2	28.5	30.9	
2630 - Manufacture of communication equipment	165.3		692.3	-	
2640 - Manufacture of consumer electronics				-	
2680 - Manufacture of magnetic and optical media				-	
4651 - Wholesale of computers, computer peripheral equipment and software	171.7			172.0	219.6
4652 - Wholesale of electronic and telecommunications equipment and parts	277.6	168.5	158.5	-	
5821 - Publishing of computer games	0.0			-	
5829 - Other software publishing	17.4			-	
61 – Telecommunications	818.7	836.7	789.5	803.8	784.2
62 - Computer programming, consultancy and related activities	341.5	306.7	350.6	362.7	393.1
631 - Data processing, hosting and related activities; web portals	27.1	22.3	26.0	47.7	59.5
8220 - Activities of call centres	21.8	23.0	27.6	28.8	25.6
951 - Repair of computers and communication equipment	14.3	6.0	6.5	7.6	9.4

Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2). Note: '-' indicates that data are either confidential or does not exist.

Looking across subsectors, a number of major differences can be identified as presented in Table 3-9 below. The time series for subsector aggregates are constructed from the detailed industries, which have a complete or nearly complete time series of observations. For example, the time series for manufacturing in the Table 3-9 below is constructed by adding together the numbers for the sub-industries 2611 and 2612 in the table above, whereas industries 2630, 2640 and 2680 are not included, because they have very incomplete time series.

Table 3-9   Annual turnover – subsectors, 2008–2012 – million EUR, adjusted for inflation by HICP (2011=100))

	2008	2009	2010	2011	2012
Manufacturing	224.3	157.0	183.1	228.3	-
Services	1.187.4	1.165.7	1.166.1	1.214.2	1.236.8
Call centres	21.8	23.0	27.6	28.8	25.6
Repair	14.3	6.0	6.5	7.6	9.4

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Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2). Note: Data are not available for trade, because neither the telecommunications trade industry nor the ICT trade industry has available data for any year except 2008.

The turnover in three of the four sectors where data are available increased, while it decreased by 34% in the repair sector. However, the turnover in the repair sector was relatively low throughout the period.

The data on turnover per employed worker are somewhat fragmented due to missing data on total turnover as displayed in the tables above. However, data indicate that the turnover per employed worker in the telecommunications sector (around EUR 300,000 per year) is around four to five times higher than the average for all sectors in Estonia. Data also suggest that for the rest of the subsectors where data are available, the turnover per employee is lower than the average for Estonia – around EUR 50,000 per year compared to around EUR 70,000 on average).

According to data from the Structural Business Statistics, the telecommunications and ICT sectors in Estonia experienced a considerable growth in the number of companies. The magnitude of the increase depends on whether the count of companies encompasses all the detailed industries or whether it only encompasses the industries where there is a complete time series of turnover. In the first situation, the number of companies increased from 1,855 in 2008 to 2,931 in 2012 – an increase of 58%. In the second situation, the number of companies increased from 1,536 to 2,629 – an increase of 71%. In general, the number of companies[46] in Estonia increased by only 9% from 2008 to 2011. In 2011, the total number of companies in Estonia was 54,933, of which the number of companies in the telecommunications and ICT sectors constituted approximately 3%. Table 3-10 below shows the number of telecommunications and ICT industries companies distributed on detailed industries.

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[46] Data reflect the total business sector: total business economy; repair of computers, and personal and household goods except financial and insurance activities (Nace Rev.2 codes: B-N, S95, except K).

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Table 3-10   Number of enterprises – detailed industries, 2008–2012

	2008	2009	2010	2011	2012
2611 - Manufacture of electronic components	34	29	22	20	17
2612 - Manufacture of loaded electronic boards	3	4	11	8	9
2630 - Manufacture of communication equipment	15	14	14	11	10
2640 - Manufacture of consumer electronics	6	6	6	10	12
2680 - Manufacture of magnetic and optical media	1	1	1	1	1
4651 - Wholesale of computers, computer peripheral equipment and software	123	133	63	89	105
4652 - Wholesale of electronic and telecommunications equipment and parts	141	124	139	154	151
5821 - Publishing of computer games	0	1	4	1	1
5829 - Other software publishing	33	20	19	19	22
61 – Telecommunications	107	112	147	177	178
62 - Computer programming, consultancy and related activities	1.103	1.169	1.457	1.756	1.936
631 - Data processing, hosting and related activities; web portals	163	194	242	317	342
8220 - Activities of call centres	25	22	23	23	23
951 - Repair of computers and communication equipment	101	111	127	159	124

Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2).

Looking across subsectors, a number of major differences can be identified as presented in Table 3-11 below. The number of companies in the services sector grew by 79%, and as services constitute about 90% of the telecommunications and ICT sectors, the growth in services dominates all other developments in the sector. The growth in the services subsector is seen in all industries constituting the service sector – also telecommunications.

Table 3-11   Number of companies, subsectors 2008–2012

	2008	2009	2010	2011	2012
Manufacturing	37,0	33,0	33,0	28,0	26,0
Services	1.373,0	1.475,0	1.846,0	2.250,0	2.456,0
Call centres	25,0	22,0	23,0	23,0	23,0
Repair	101,0	111,0	127,0	159,0	124,0

Source: Eurostat, Structural Business Statistics (sbs_na_1a_se_r2). Note: Manufacturing is constructed on the basis of industries 2611 and 2612. 'Services' is constructed on the basis of industries 61, 62, 631. Call centres correspond to industry 8220. Repair corresponds to industry 951.

Looking at the average number of employed persons per company, data show significant differences between the different subsectors in the telecommunications and ICT sectors. The largest average company size measured in number of employees per company is found in manufacturing of communication equipment (approx. 285) and manufacturing of consumer electronics (approx. 150). The figures also suggest that

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the companies in computer programming, consultancy and related activities, data processing, hosting and related activities; web portals and repair of computers and communication equipment on average are small companies with approximately three to five employees. In comparison, the average company in Estonia employs approximately 10 workers.

Based on the analysis of this subsector, we assess that the turnover has remained more or less constant between 2008 and 2011, but the number of companies has increased significantly. Hence, the turnover per company has decreased significantly. We assess the decrease in turnover per company to be approximately 36% in the period from 2008 to 2011 for the telecommunications and ICT sectors as a whole.

3.3.2 Employment and working conditions

According to official statistics (Statistics Estonia), there were 2,917 employers in the ICT sector in 2012, of which most were SMEs, as only 12 of the employers had more than 250 employees. The latest statistics for the second quarter of 2014 indicate that the number of employers has stayed largely the same, i.e. 2,916. In 2012, the number of employed persons in the sector was 20,240, of which 18,776 were employees. In the second quarter of 2014, the average number of employees was 20,621. This indicates that about 3.3% of all the workers in the economy are in the ICT sector.

Figure 3-5   Number of full-time employees, 2008–2013
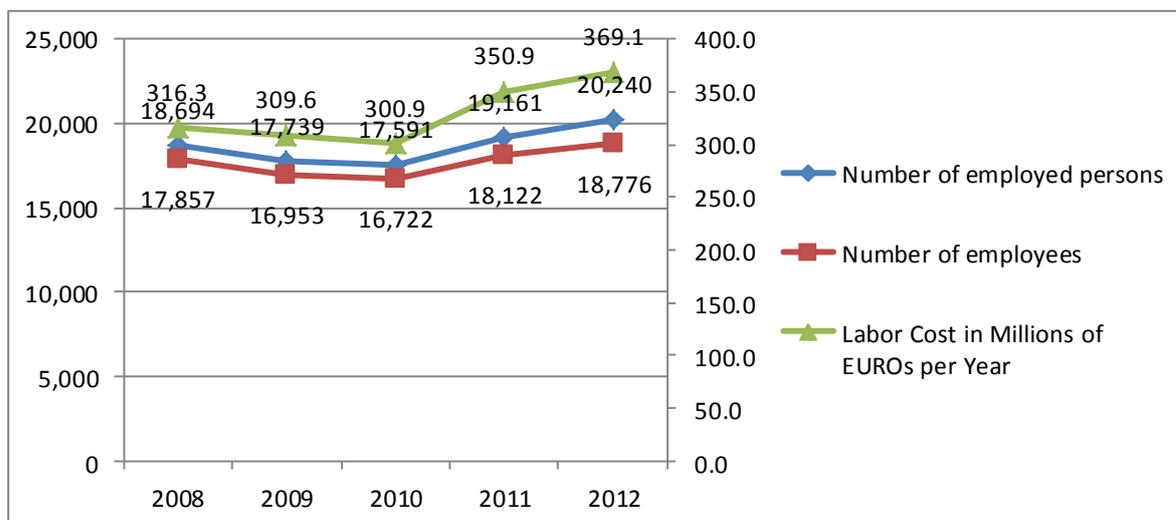
Source: Statistics Estonia.

The number of employed persons and employees declined slightly starting in 2008 due to the economic recession, but has recovered and increased to new heights during recent years.

The number of employed persons per company decreased from 12.2% to 7.3% from 2008 to 2011. The decrease was mainly caused by the increase in the number of companies.

The education levels of the persons employed by the telecommunications and ICT sectors are shown below. The ICT manufacturing and repair industries rely on a pool

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of employees, who have relatively low levels of education compared with employees in other industries in the telecommunications and ICT sectors. In manufacturing, 71% of the employed persons have either low or medium levels of education. In repair, 73% of the employed persons belong to these education categories. In call centres, 66% of the employed persons have low or medium levels of education, whereas only 35% of the employed persons fall into the low or medium education groups in the computer programming sector.

*Table 3-12   Distribution of employees in the **telecommunications and** ICT sectors by highest attained level of education, % of employees, 2013*

	263 - Manufacturing of communications equipment	**61 – Telecom-munications**	**62 - Computer programming, consultancy and related activities**	**820 - Activities of call centres**	**951 - Repair of computers and communications equipment**	**All employed workers**
1.Low	16%	0%	7%	0%	0%	8%
2.Medium	55%	46%	28%	66%	73%	51%
3.High	29%	54%	64%	34%	27%	41%
No answer	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

Source: Own exposition using Labour Force Statistics data.
Note: The education levels are defined according to the ISCED definition, where "Low" corresponds to ISCED levels 0-2, "Medium" corresponds to levels 3-4 and "High" corresponds to levels 5-8.

The small number of large companies employs 40% of the employees and 36% of the employed persons in the sector. Small enterprises with up to 50 employed persons make up 98% of the total number of enterprises, but employ only 43% of the employed persons. These structures are more or less the same as in other sectors and in the economy as a whole.

There is no sector-specific information on the contractual situation. In the Estonian employment relations system, there are in general employees, workers with private contracts and civil servants. According to the official statistics, about 92% of the employed persons are employees or civil servants, of which 95% are employees. It is very likely that the basic contractual situation is the same for the ICT sector, but the share of civil servants is smaller.

According to Statistics Estonia, the average monthly gross wage in the ICT sector remained at a much higher level compared with the average monthly gross wage in other sectors of Estonia and is also the highest compared with all other sectors. The average monthly gross wage increased from EUR 1,294 in 2008 to EUR 1,576 in 2013, while the average monthly gross wage in Estonia increased from EUR 825 in 2008 to

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EUR 949 in 2013. Thus, the average gross wage in the ICT sector is almost 40% higher than the average gross wage in other sectors of Estonia and the wage increase has been much faster (18% compared with 13% in the average gross wage in Estonia in the period 2008 to 2013). A recent analysis indicates that the demand for labour in the ICT sector is higher than the supply[47]. From this, it can be deduced that at least, in theory, the bargaining power of the employees in the ICT sector is strong, which gives them the opportunity to renegotiate their terms of employment or to put forward demands for improved working conditions.

According to Eurostat's Labour Force Survey, the majority of workers in the telecommunications and ICT knowledge services work more than 40 hours per week, as shown in Table 3-13 below.

Table 3-13   Share of employees working more than 40 hours per week, %

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**% change 2008-2013**
61 – telecommunications	100%	100%	100%	100%	100%	100%	0%
62 - computer programming, consultancy and related activities	88%	88%	92%	95%	92%	85%	-3%

Source: Own exposition using Labour Force Statistics data.

It seems that the financial crisis has increased the working hours in the ICT knowledge services, sector 62, as the share of workers that works more than 40 hours per week increased from 2008 to 2011. However, this share has declined since then.

Based on the information in this subsection, we assess that working conditions in the Estonian telecommunications and ICT sectors have become more challenging in the period from 2008 to 2011. This is because the number of weekly working hours has increased and because the number of employed persons on a company basis has decreased – assuming that large firms are more likely to have in-place systems, which protect workers, such as security and representation systems.

3.3.3   Industrial relations

The current Estonian industrial relations system has a dual-channel employee representation system according to which both trade unions and shop stewards can represent the employees. Worker organisations, however, have a prerogative to negotiate and conclude collective agreements. A worker in Estonia can choose a trade union among the 20 different trade unions in Estonia. According to recent statistics,

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[47] See: Jürgenson, A., Mägi, E., Pihor, K., Batueva, V., Rozeik, H., Arukaevu, R. (2013). Eesti IKT kompetentsidega tööjõu hetkeseisu ja vajaduse kaardistamine. Tallinn: Poliitikauuringute Keskus Praxis. http://www.praxis.ee/wp-content/uploads/2014/03/2013-IKT-kompetenstidega-toojoud-uuringuaruanne.pdf.

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the trade union density was 5.6% in 2013, after which it has decreased year after year[48].

In Estonia, the law provides for a dual-channel system of employee representation in companies. Thus, representatives of trade unions and shop stewards may be present in a given company at the same time. While the members of trade unions, who work in the company, elect the representative of the trade union, the shop steward is elected at the employees' general meeting to represent all employees working in the company.

Collective bargaining and social dialogue

Collective bargaining in Estonia is quite decentralised and most of the collective agreements in Estonia are concluded at company level. The ICT sector does not differ from this structure, as the national minimum wage agreement is considered the only national-level collective agreement. As of 1992, the national minimum wage was first agreed upon in a tripartite agreement. Since 2002, minimum wages have been set in annual bipartite agreements between the EAKL and the ETTK and brought into effect by a government decree. The national monthly minimum wage is valid for all full-time workers, and an hourly minimum wage is calculated. There is no differentiation for other groups of workers (except for additional minimum wage agreements in some sectors and occupations)[49]. There are also some sectoral-level collective agreements (in transport and health care)[50].

Exact information on the number of company-level agreements is not available. The Ministry of Social Affairs organises the collective agreements register[51]. The register and additional information from trade unions are the main sources of information on collective bargaining practices. The register does not include comprehensive data on all concluded collective agreements and not all collective agreements are registered. However, since no surveillance system exists, no penalties for violations of agreements are issued. At the same time, trade unions only have information on agreements concluded by their affiliates[52].

The Work Life Survey from 2009 indicates that 32.7% of the employees are covered by a collective agreement, while 5.4% of the employees state that they do not know whether a collective agreement has been concluded. The survey also indicated that about 6% of the companies have concluded a collective agreement[53].

As in all sectors, when a company concludes a collective agreement, the agreement becomes legally binding; in other words, the signing parties have an obligation to follow the agreement and to refrain from strikes or lockouts[54]. Industrial action is

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[48] See: http://www.sm.ee/sites/default/files/content-editors/Ministeerium_kontaktid/ Valjaanded/toovaldkonna_areng_2013.pdf.
[49] Osila, L; Nurmela, K. Estonia: Industrial relations profile. Praxis Center for Policy Studies, 2012.
[50] Osila, L; Nurmela, K. Estonia: Industrial relations profile. Praxis Center for Policy Studies, 2012.
[51] See: http://klak.sm.ee/.
[52] Estonia: Industrial relations profile [http://www.eurofound.europa.eu/eiro/country/estonia_4.htm].
[53] Eesti tööelu-uuring 2009 (Estonian Work Life Survey 2009). Sotsiaalministeeriumi toimetused nr 3/2011.
[http://www.tooelu.ee/UserFiles/Uuringud/toimetised_20113.pdf.].
[54] Estonia: Industrial relations profile [http://www.eurofound.europa.eu/eiro/country/estonia_4.htm].

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generally uncommon in Estonia and, thus, strike action is well below the European average. Estonian legislation does not allow strike action before an attempt has been made to resolve the conflict, i.e. collective bargaining under the mediation of the National Conciliator[55]. If the parties cannot reach an agreement, collective action may be taken. So far, the mediation procedures have proved rather successful in terms of conflict resolution. In most cases, the company and the workers will reach an agreement. Agreement was reached in three cases in 2010 and in two cases in 2011. One case in 2011 was dismissed, as the party who made the application to the National Conciliator lost its interest in the case. The other four cases remained unresolved, so employees gained the right to strike or organise a lockout. There is no information available, however, on any collective labour dispute in the ICT sector.

The system of tripartite concentration is not properly institutionalised in Estonia. Social partners seek to participate in political decision-making on a regular basis in terms of drafting legislation; however, they are often dissatisfied with their level of inclusion[56].

Information about the contents of the collective bargaining is available on a general level for Estonian companies. Usually, the main issue in collective bargaining is wages, followed by regulations regarding working time and resting periods. Other issues that are usually covered include further training, the relations between the employer and the employee, and working conditions and the working environment, including the issue of occupational health and safety. Since specific information on the contents of collective agreements is not available, it is not possible to assess the exact extent to which training and lifelong learning is part of the collective bargaining[57].

There have been no studies of the incentives to participate in collective bargaining in different sectors across Estonia. Based on expert opinion, however, there are several potential factors affecting the trade union movement, membership and participation when it comes to collective bargaining in the ICT sector. Firstly, trade union density in Estonia is in general quite low and has been declining since the restoration of independence. At the same time, the sectoral-level trade union in the ICT sector was established only in 2004, at a time when trade union density had already been declining. Secondly, collective bargaining is mainly used for negotiating wages. According to the statistics presented above, however, the wages in the ICT sector are already much higher compared to the average wages in Estonia. In addition, the demand for labour in the sector is higher than the supply, which indicates that the bargaining power of the ICT sector employees is very high even without intervention by the trade union, and they are able to agree on suitable pay and working conditions through individual negotiations.

Still, according to the statement made by the Telecommunications and Infotechnology Employees Trade Union representative in 2011, their aim in the coming years is to increase their membership among other telecommunications and IT companies. In

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[55] See: www.riikliklepitaja.ee.
[56] See more precisely Estonia: Industrial relations profile. [http://www.eurofound.europa.eu/eiro/country/estonia_4.htm].
[57] Estonia: Industrial relations profile [http://www.eurofound.europa.eu/eiro/country/stonia_4.htm].

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addition, explaining the motivation why employees working in the ICT sector should belong to the trade union, the representative presented two main incentives; to collectively stand for sufficient training and transparent remuneration policy.[58]

Only three companies in the telecommunications and ICT sectors (AS Levira, Elion Ettevõtted AS, Televõrgu AS) have a collective agreement.

The development has led to decreasing turnover and employment per company, which may lead to impaired working conditions. An example of this may be the longer working week for employees in the sector.

3.3.4   Summary

Based on the information collected for this case study, we assess that the balance in the Estonian telecommunications and ICT sectors is shifting away from manufacturing and telecommunications towards knowledge services. This is based on the decreasing turnover in manufacturing and telecommunications and the increasing turnover in knowledge services. The absolute increase in the number of knowledge service firms also exceeds the absolute increase in the number of telecommunications firms.

The turnover has remained more or less constant from 2008 to 2011, but the number of companies has increased significantly. Hence, the turnover per company has decreased significantly.

Partly as a result of the decrease in turnover per company, the Estonian telecommunications and ICT sectors working conditions have deteriorated from 2008 to 2011. This is because the weekly working hours has increased and because the number of employed persons per company has decreased.

The Work Life Survey from 2009 indicates that 32.7% of the employees are covered by a collective agreement.

3.4   Romania

3.4.1   Boundaries of the telecommunications and ICT sectors

The telecommunications sector has grown at a fast rate since 2003. New regulations were adopted in order to provide a better market environment for businesses, and to offer affordable access to end-users. Romania's Ministry of Communications and Information Society has set goals to develop a knowledge-based society by developing the ICT industry, to increase the citizens' access and performance of public administration, and to use the most recent ICT developments to drive economic competitiveness. The Romanian government provides the regulation authority, funding and implementation of the communications programmes. The political and regulatory environment, however, affects the economic transformation and innovation in the ICT field.

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[58] See: http://www.eakl.ee/?pid=449&nid=331&lang=5.

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Telecommunications and ICT activities are provided by organisations that are specifically operating in these sectors, according to information provided by a trade union.

The (presently defined) ICT sector in Romania includes the following three subsectors: telecommunications, software and IT services, and hardware and electronics. The highest economic activity occurs in the telecommunications sector, comprised of mobile telephony (61.7%), landline telephony (33.5%) and Internet and other data transmission services (4.8%). In the landline telephony sector, there are 31 operators, while there are six mobile telephone providers.

The assessment of the boundaries of the telecommunications and ICT sectors has not resulted in clear answers on facts about the moving boundaries of the telecommunications and ICT sectors. The stakeholders' state that the NACE and OECD definitions are inadequate, but that the ITU definition is better. The Romanian legislation from 2011 prevents the conclusion of collective agreements (on wages and working conditions).
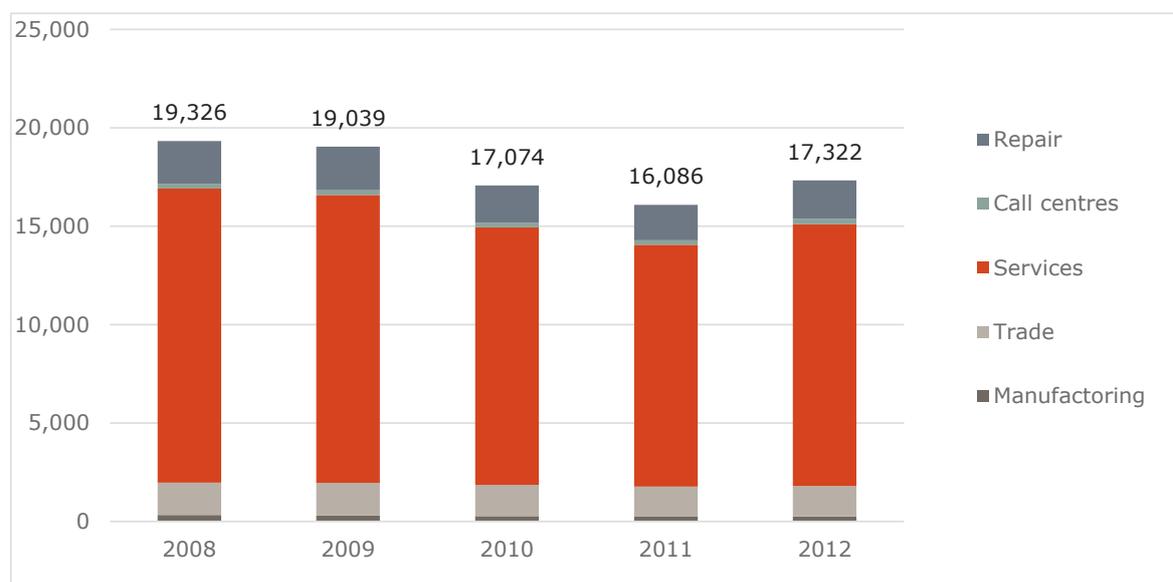
A respondent also notes that using the statistical classifications of economic activity, which are based on the main economic activity of firms, will not be optimal for the purpose of finding representation of the telecommunications and ICT sectors. It is stated that "*Each company has a small call centre, one small IT team (helpdesk) and a small team for maintenance, so we can say that these three activities are found in all sectors of economy.*" Furthermore, she finds that the overlapping activities in the telecommunications and ICT sectors constitute an increasing part of the economic activities in the sectors.

3.4.2   Economic activities in the sectors

Figure 3-6 below shows the number of companies in the telecommunications and ICT sectors in Romania. The number of ICT companies has decreased by 10% since 2008 to a total of 17,322 in 2012. In general, the number of companies[59] has decreased by 19% in Romania since 2008. Hence, the number of ICT companies in Romania has decreased less than the total number of companies. Looking across subsectors there are some large differences as presented in Figure 3-6 below.

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[59] Total business economy; repair of computers, personal and household goods; except financial and insurance activities.

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Figure 3-6   Number of companies – subsectors, 2008–2012

Four subsectors in Romania have experienced a fall in the number of companies; manufacturing (25%), services (11%), repairs (10%) and trade (5%). At the same time, however, the number of call centres increased by 12%.

It has been difficult to find data on the number of employees in the Romanian ICT and Telecommunications sector. The data from the LFS have many gaps. It is therefore concluded that the uncertainty involved in presenting these data are too large.

The annual turnover[60] for companies in the telecommunications and ICT sectors has decreased by 26% since 2008. At the same time, the total business sector turnover decreased by 23% in the period 2005–2011.

Looking across subsectors, the data show that four out of five subsectors have experienced a decrease in turnover in the period. The call centre subsector is the only one with an increase in turnover (53%).

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[60] Adjusted for inflation by HICP (Harmonized indices of consumer prices), base year is 2011.

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Figure 3-7   *Annual turnover – subsectors, 2008–2018 – million EUR, adjusted for inflation by*
            HICP (2011=100)
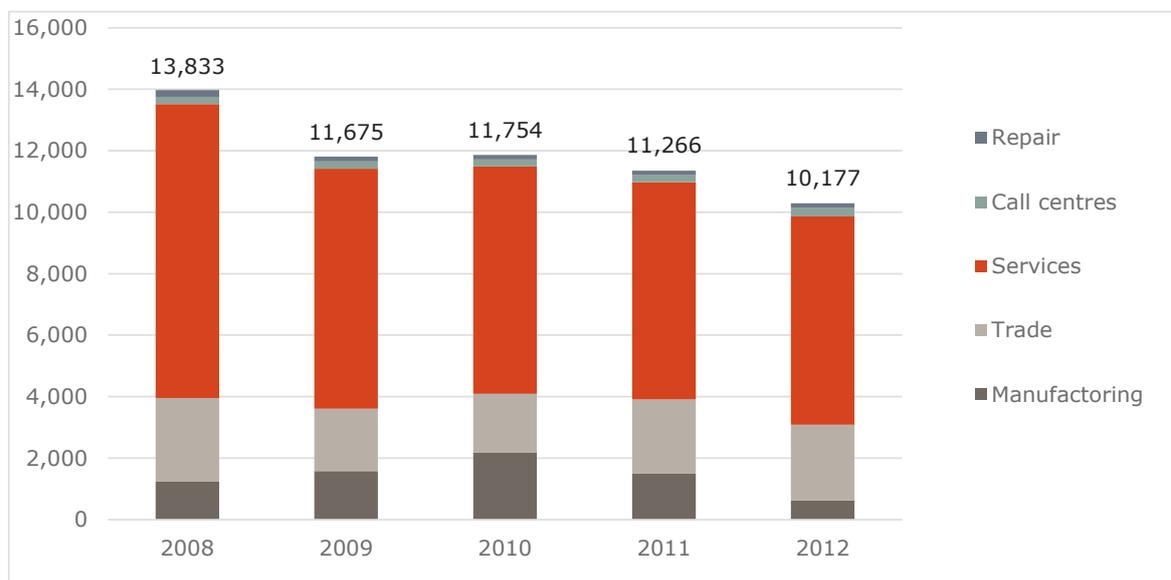
*Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2), Harmonized indices of
consumer prices (HICP) (t_prc_hicp) and COWI.*

3.4.3   Employment and working conditions

Results from the interview indicate that the ICT industry in Romania hires highly
qualified candidates. These candidates generally work for foreign transnational
companies, which dominate the Romanian ICT market, and the main professions in
this sector include telecom specialists, telecom technicians and call centre operators.
Due to a highly skilled low cost labour force of the IT professionals in Romania, more
foreign companies choose to open operational centres in Romania.

According to information provided by Romanian trade unions, overtime is generally
not paid for, and salaries are lower than in other countries in the European Union.
Additionally, the organisation also states that in Romania, there are no specific laws
that state how career advancement and training should be applied in the ICT sector.

Labour Force Survey data on the share of employees on permanent contracts indicate
that temporary contracts are not used in the Romanian telecommunications and ICT
sectors. According to the data, which have been made available for this study, the
share of employees on permanent contracts has remained unchanged at 100% in the
period 2008-2013. The work week for employees in the Romanian telecommunications
and ICT sector exceeds 40 hours for all employees in ICT manufacturing, whereas the
share is closer to 90% for employees in ICT services. The work week for employees in

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ICT services appears to have declined in the period 2008-2013. In comparison the average work week for all employed persons in Romania is around 40 hours[61].

Table 3-14   Share above 40 hours of weekly working hours, %

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**% change 2008-2013**
Manufacturing	100%	100%	100%	100%	100%	100%	0%
Services	100%	99%	100%	99%	92%	93%	-7%

Source: Own exposition using Labour Force Statistics data.

3.4.4   Industrial relations

In Romania, the employer is considered a rightful company representative at company level. At sector and national levels, however, representatives are determined by employer organisations filing an application with the Bucharest City Court.

Collective bargaining and social dialogue

In 2011, the collective bargaining system in Romania was changed through the social dialogue Act (SDA), according to which new rules for industry and company-level bargaining were established and national-level bargaining was abolished (WP, 2014). The SDA states that a collective agreement is mandatory only at company level, with the exception of companies that have less than 21 employees (WP, 2014). According to the act, company collective agreements cannot stipulate lesser or fewer rights than the rights recognized under sectoral collective agreements. As of 31 December 2012, 8,783 collective agreements existed at company level, which shows an increase compared to 2011 (7,473) and 7,718 in 2010 (WP, 2014). According to the rules set forth by the SDA, sectoral collective agreements should affect only companies affiliated to employer organisations. Requests for extensions of a sectoral collective agreement to all entities in the sector need to be examined and approved by the National Tripartite Council for Social Dialogue. As of May 2011, 36% of the Romanian employees are covered by collective bargaining (WP, 2014).

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[61] Source: Eurostat lfsa_ewhun2.

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In Romania, 40% of the employees are members of a trade union (EIRO, 2012). In 2011, new rules determined by the SDA determined that a trade union could be established by at least 15 members working in the same company. Additionally, a trade union has the right to sign a collective agreement or bargain only if its members represent at least the majority of the company's total number of employees. According to the interviewees, the new rules have resulted in a weaker position for the trade unions.

3.4.5 Summary

As presently defined the ICT sector in Romania includes three subsectors: telecommunications, software and IT services, and hardware and electronics. The country case study has not resulted in a clear recommendation for a definition. However, stakeholders prefer the broad ITU definition without being very clear.

The highest economic activity occurs in the telecommunications sector, comprised of mobile telephony (61.7%), landline telephony (33.5%) and Internet and other data transmission services (4.8%). In the landline telephony sector, there are 31 operators, while there are six mobile telephone providers.

The available data indicate that temporary contracts are not used in the Romanian telecommunications and ICT sectors. The share of employees on permanent contracts has remained unchanged at 100% in the period 2008-2013.

Collective agreements are mandatory only at company level, with the exception of companies that have less than 21 employees.

3.5 Germany

3.5.1 Boundaries of the telecommunications and ICT sectors

During the last two decades the technological progress and change in information and communication technologies have accelerated rapidly. Today the telecommunications and ICT sectors are not only related to specific manufacturing and service sectors, but comprise a horizontal technology that is affecting all economic sectors, working life and other areas of the German society and elsewhere in the world.

Thus, the telecommunications and ICT sectors in Germany are fast moving targets. This has resulted in constant adaptations of definitions and statistical concepts of what is meant by the telecommunications and ICT sectors in Germany. Whereas the Federal Statistical Office has adopted the OECD definition of the sector,[62] actors such as the main employer organisation BITKOM have adopted slightly different statistical concepts. Furthermore, the German Government has in 2014 adopted a 'Digital Agenda'[63] and today prefers to speak about the 'Digital Economy' that not only

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[62] Statistisches Bundesamt 2013: IKT Branche in Deutschland. Bericht zur wirtschaftlichen Entwicklung, Wiesbaden.
[63] See: http://www.bmwi.de/DE/Themen/Digitale-Welt/digitale-agenda.html.

includes the telecommunications and ICT sectors but also other sectors, e.g. sectors in the field of media and consultancy. More recently, a growing number of reports and research have also considered the rapidly progressing 'Internet Economy' as a very dynamic segment of the digital economy[64].

Hence, the German stakeholders are in general in favour of a broad definition of the sectors. For the purpose of the statistical analysis in this study we resort to the use of the statistical definition of the Federal Statistical Office, i.e. we take outset in the OECD concept of the telecommunications and ICT sectors. Currently, this definition is also the only one that allows for assessing long-term developments of employment, company developments and other indicators and international comparison. The NACE Rev.2 sectors covered are thus:

▪ ICT manufacturing (26.1 – 26.4, 26.8), i.e. companies that are engaged in the production of electronic components and boards, computers and peripheral equipment, communication equipment, consumer electronic and related media, magnetic and optical media[65].

▪ ICT trade (46.51, 46.52), i.e. wholesale of information and communication equipment.[66]

▪ ICT service industries, in particular various telecommunications service activities (61), IT services, computer consultancy, programming and related services (62) as well as software publishing (58.2), database and web services (63.1) and repair of ICT products except of consumer electronic (95.1).

With an annual turnover of EUR 228 billion (2013) and a contribution of around EUR 85 billion to the commercial valued creation, the economic role of the Telecommunication and ICT sectors – using this definition – were in Germany even higher than those of the traditional industrial strongholds such as the mechanical engineering and automotive industry[67].

Though definitions differ slightly, recent reports of the Federal Ministry of Economic Affairs, the main employer organisation in the ICT sector BITKOM as well as the Federal Statistical Office calculate that in 2013 the overall number of employed in the whole Telecommunication and ICT sectors was around 960,000, i.e. a share of more than 3% of overall employment in Germany. The overall employment in the Telecommunication and ICT sectors is thus higher than in the automotive industries and the chemical/pharmaceutical industries.

Furthermore, there are a number of overlaps with other sectors. Hence, if Telecommunication and ICT activities in companies outside the actual sectors are taken into account, the employment effects are even more striking. Many companies

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[64] See: BVDW 2014: Die digital Wirtschaft in Zahlen von 2008 bis 2014, Bundesverband Digitale Wirtschaft, Düsseldorf; Verband der Deutschen Internetwirtschaft 2014: Die Deutsche Internetwirtschaft 2012-2016, Cologne.
[65] Companies which produce mainly electro-medical equipment, instrumentation and control devices or optical instruments (for example, as well as digital cameras), being excluded by the definitions of the OECD.
[66] Not including retail of ICT products and consumer electronics.
[67] According to the Federal Ministry for Economic Affairs' Monitoring Report 2013.

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in sectors such as financial services, education or health services and also other manufacturing sectors carry out their own Telecommunication and ICT activities – which are not included in the statistical definition presented above. According to the 2013 Monitoring Report of the Federal Ministry for Economic Affairs, the telecommunications and ICT economy in Germany secures 360,000 jobs in other sectors[68]. The Telecommunication and ICT sectors have also further indirect employment effects: Estimations suggest that 1,000 new jobs in the Telecommunication and ICT sectors create more than 900 jobs in upstream sectors[69].

Economic activities in the sectors

In 2011, each employed person in the Telecommunication and ICT sectors on average created a value added of 100,860 Euro, which was higher than in every other sector and thus, illustrates the importance of the sector for the Germany economy as a whole[70].

The Telecommunication and ICT sectors have developed quite dynamically during the last two decades. In the following, we present a brief overview of change in the business demography, turnover and employment in the sectors. However, due to statistical inconsistencies and breaks in the definition/classification of the sectors, longer-term developments are extremely difficult to document[71]. Thus, the following description of more aggregated data is focusing on the last decade.

Indicators such as employment, number of companies and turnover illustrate the strong economic and labour market impact of the Telecommunication and ICT sector and its three main subsectors in the field of manufacturing, wholesale and services.

In 2010, there were around 75,000 companies that achieved a turnover of nearly 282 billion euros and an overall employment of 926,000 as displayed in Table 3-15 below[72].

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[68] Bundesministerium für Wirtschaft und Energy 2013: Monitoring Report Digitale Wirtschaft 2013, Berlin, p. 23.
[69] Monitoring Report, p. 23.
[70] Monitoring Report, p. 23.
[71] Aufgrund methodischer Anpassungen in der WZ-Systematik zum Berichtsjahr 2008 ergaben sich auch Veränderungen in Bezug auf die frühere Beschreibung der IKT-Branche.
[72] According to Statistisches Bundesamt, IKT-Branche in Deutschland, 2013. These 2010 data are also the basis of the following more detailed table. However, employment data are taken from the database of the Federal Employment Agency as 2013 data are available for all subsectors.

Table 3-15   *Employees, companies and turnover of the Telecommunication and ICT sectors in Germany*

		Employees[1]	Companies	Turnover, million Euro
		2013	**2010**	**2000**
Telecommunication and ICT manufacturing[2]				
26.1	Manufacture of electronic components and boards	164,156	1,834	23,702
26.2	Manufacture of computers and peripheral equipment	24,427	1,470	5,702
26.3	Manufacture of communication equipment	36,396	849	5,657
26.4	Manufacture of consumer electronics	10,845	207	3,356
26.8	Manufacture of magnetic and optical media	2,952	133	100
Total		**238,776**	**4,493**	**38,518**
Wholesale of Telecommunication and ICT equipment				
46.5	Wholesale of information and communication equipment	**45,713**	**4,919**	**81,768**
Telecommunication and ICT services				
58.2	Software publishing	23,622	507	1,149
61.1	Wired telecommunications activities	36,105	521	34,907
61.2	Wireless telecommunications activities	12,731	431	22,477
61.3	Satellite telecommunications activities	721	165	425
61.9	Other telecommunications activities	21,961	1,365	14,851
62	Computer programming, consultancy and related activities	550,339	57,737	80,800
63.1	Data processing, hosting and related activities; web portals	19,528	3,292	5,544
95.1	Repair of computers and communication equipment	9,757	1,548	1,082
Total		**674,764**	**66,566**	**161,236**
Telecommunication and ICT – Total		**959,253**	**74,978**	**281,521**

Source: Statistisches Bundesamt, IKT-Branche in Deutschland, 2013; Wilke, Maack and Partner calculations (employment data)

Note: 1 According to the employment statistic of the Federal Labour Office, covering all employees covered by social security contributions.

The three main subsectors that make up the Telecommunication and ICT economy in Germany differ significantly: In 2013, around 70% of the total workforce of the Telecommunication and ICT sector was employed in the various Telecommunication and ICT services and most of them in the field of programming, consultancy and related activities. Telecommunication and ICT services are characterized by a large number of companies – more than 65,500 of the total telecommunications and ICT sector companies are related to services (87%) and thus average company sizes in Telecommunication and ICT services (around 9 employees) are significantly smaller than in Telecommunication and ICT manufacturing (49 employees).

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While only 6% of the companies of the Telecommunication and ICT sectors were in Telecommunication and ICT manufacturing in 2010, the share of total turnover was significantly higher (13.7%) and nearly 25% of the whole workforce of the Telecommunication and ICT sectors as in manufacturing, in particular in the field of manufacturing of electronic components and boards (164,000).

In 2010, around 57% of the total turnover of the sector was provided by Telecommunication and ICT services with Telecommunication and ICT wholesale and Telecommunication and ICT manufacturing contributing to 29% and 23.7%. Turnover per employee in Telecommunication and ICT wholesale was significantly higher than in services as well as manufacturing.

In Germany, the companies in the telecommunications and ICT sectors have generally on average more employed persons per company than on average. While the general number of employees per company is around 20 in Germany, the average number of employees per company in for example Wired telecommunications activities is around 69 and in Manufacture of electronic components and boards it is around 90. In total the number of employed per company is higher than average in more than half of the sectors in the telecommunications and ICT sectors.

Similar in most of the sectors within the telecommunications and ICT sectors, the turnover per employee is higher than on average in Germany. The highest turnover per company can be found in Telecommunications which is around 3-4 times higher than on average. The smallest turnover per employee can be found in Repair of computers and communication equipment and in manufacturing of magnetic and Optical media (between EUR 20,000-50,000 per year).

During the last decade, the Telecommunication and ICT sectors were amongst the fastest growing sectors in the German economy. On average, employment growth per year between 2008 and 2012 was 3.4% while the overall average was only 0.9%[73]. As a result, the Telecommunication and ICT sectors as a whole created nearly 86,000 additional jobs.

At the same time, the internal structure of the Telecommunication and ICT sectors changed significantly with some sectors experiencing a strong growth in employment while others contracting. While on an aggregate level, the manufacturing of Telecommunication and ICT products and equipment between 2008 and 2012 lost more than 23,000 jobs the overall growth mainly resulted from the strong job creation in Telecommunication and ICT services – in particular computer programming, consultancy and related activities created more than 90,000 jobs and increased its employment by more than 20%. Other strong growth sectors within Telecommunication and ICT services were software publishing and data processing, hosting and related activities as well as web portals.

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[73] Gehrke, B.; Cordes, A. et al.: Informations- und Kommunikationstechnologien in Deutschland und im internationalen Vergleich, February 2014, p. 17.

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Amongst those sectors that lost a significant share of employment were also all activities in the field of telecommunications services (apart from satellite telecommunications activities but here, employment figures are very small). In total the telecommunications activities sector lost more than 25,000 jobs between 2008 and 2012 and contracted by around one quarter with most of the job losses occurring in wired telecommunications services. This trend is rather recent, compared to the period between 2003 and 2007 where employment in the telecommunications services was quite stable. [74]

As Table 3-16 illustrates, the growth/decline dynamic within the different Telecommunication and ICT sectors between 2008 and 2013 was quite diverse.

Table 3-16   Telecommunication and ICT sectors with strongest growth and decline of employment 2008 - 2013

	Total employment losses/gains	% change
62 Computer programming, consultancy and related activities	109,790	24.9
26.1 Manufacture of electronic components and boards	23,414	16.6
58.2 Software publishing	14,232	151.6
46.5 Wholesale of ICT equipment	8.009	21.2
63.1 Data processing, hosting and related activities; web portals	6.337	48.0
61 Telecommunications activities	-14,088	-28.1
26.3 Manufacture of communication equipment	-23,166	-38.9
26.2 Manufacture of computers and peripheral equipment	-13,046	-34.8
ICT TOTAL	**99,307**	**11.5**
ICT manufacturing total	**-13,041**	**-5.2**
ICT services total	**109,790**	**24.9**
Telecommunication activities total	**-26,894**	**-27.3**

Source: Wilke, Maack and Partner, based on data of the Federal Employment Agency.

Though long-term trends of employment and other economic indicators are not available due to breaks in the statistical classification of sectors, the more recent trends in employment are reflecting long-term structural changes within the Telecommunication and ICT sectors. These trends reflect both technological developments (emergence of the digital economy) but also the offshoring of more labour intensive production to low cost countries (e.g. to the new EU Member States and East Asia more recently. On the other hand, job losses also result from an increasing automation of production processes, as well as outsourcing of basic tasks. These changes have resulted in significant job losses of Telecommunication and ICT manufacturing already during the first half of the last decade; a report of the Federal

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[74] See Statistisches Bundesamt 2009: Entwicklung der Informationsgesellschaft. IKT in Deutschland, Wiesbaden, p. 9.

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Statistical Office covering the period 2000 – 2006 documents for example a net loss of around 48,000 industrial jobs (-10%)[75].

Also in the period mentioned above, the expansion of jobs in services outnumbered the job losses in manufacturing. Between 2000 and 2006, the service sector grew by 18% and reported a net job creation of 70,000 with most significant increases in data processing and hosting and software publishing.

In the following we describe the employment developments in the period 2008-2013 in Germany with regards to workers' sex, age, education and employment relations.

The telecommunications and ICT sectors in Germany are male dominated which is illustrated in Table 3-17 below. The share of males is larger than all active populations in Manufacturing, Services and Repairs, while call centres are female dominated.

Table 3-17   Share of males 2008 - 2013

Sector	2008	2009	2010	2011	2012	2013	Change 2008-2013
Manufacturing	75%	74%	77%	75%	76%	74%	-1%
Services	74%	74%	75%	75%	76%	75%	2%
Call Centres	48%	36%	35%	35%	35%	35%	-26%
Repair	88%	97%	96%	92%	92%	91%	3%
All employed workers	**55%**	**54%**	**54%**	**54%**	**54%**	**54%**	**-2%**

Source: Own exposition using Labour Force Statistics data and lfsa_egan2

Note: Includes only workers with working status "Employed"

Furthermore, Table 3-17 displayed some large differences in the development during the period 2008-2013. The share of males decreased by about 26% in Call centres in the period, while increased with 2% in Services and 3% in Repair.

Workers in Germany are in general older, with around 1/3 of the active population aged 55 and above, cf. Table 3-18 below.

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[75] Statistisches Bundesamt 2007: Entwicklung der Informationsgesellschaft. IKT in Deutschland, Wiesbaden, p. 11.

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Table 3-18   Age distribution, 2013

Sector	15-24	25-54	55-64	65+	Total
Manufacturing	5%	81%	13%	0%	100%
Services	7%	83%	10%	1%	100%
Call Centres	15%	79%	6%	0%	100%
Repair	6%	86%	9%	0%	100%
All employed workers	**10%**	**57%**	**31%**	**2%**	**100%**

Source: Own exposition using Labour Force Statistics data and lfsa_egan Note: Includes only workers with working status "Employed"

However, the workers in the telecommunications and ICT sectors are somewhat younger with only around 6-13% aged more than 55 years. Furthermore, Table 3-18 shows that the workers in Manufacturing, Services and Repair are more or less the same age, while the workers in Call Centres are younger with around 94% aged below 54 years.

Looking at the development in the period 2008-2013, the figures show only limited variation. However, there is a small tendency that workers in Call centres are younger in 2013 than in 2008.

The workers in the telecommunications and ICT sectors are generally higher educated than all employed workers on average, cf. Table 3-19 below.

Table 3-19   Educational distribution, 2013

Sector	Low	Medium	High	No answer	Total
Manufacturing	4%	53%	43%	0%	100%
Services	4%	47%	49%	0%	100%
Call Centres	8%	77%	16%	0%	100%
Repair	0%	74%	26%	0%	100%
All employed workers[1]	**13%**	**58%**	**29%**	**0%**	**100%**

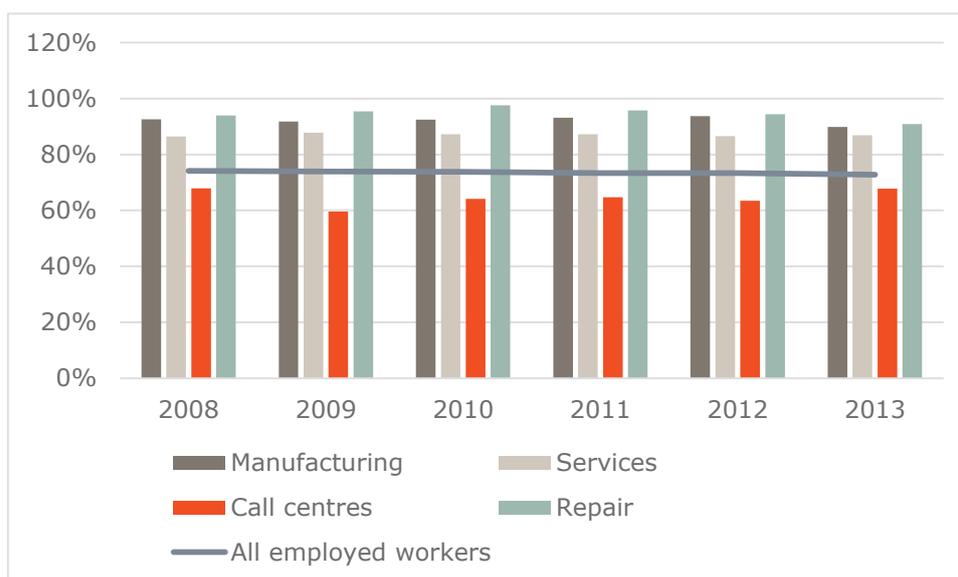*Source: Own exposition using Labour Force Statistics data and lfsq_egaed*

Note: Includes only workers with working status "Employed".

"1": Low is defined as less than primary, primary and lower secondary (levels 0-2), medium is defined as Upper secondary and post-secondary non-tertiary (levels 3 and 4) and high is defined as short-cycle tertiary, bachelor or equivalent, master or equivalent and doctoral or equivalent (levels 5-8)

While 13% of all employed workers have the lowest educational level, the share is 4% in Service and Manufacturing, 8% in Call centres and 0% in Repair. Similarly, a higher share of the workers in Manufacturing and Services has the highest educational level than all employed workers.

Some stakeholders perceive that the core workforce in the telecommunications and ICT sectors has been reduced. To examine this further, Figure 3-8 below shows the use of full-time and part-time jobs in the telecommunications and ICT sectors compared to the general labour market.

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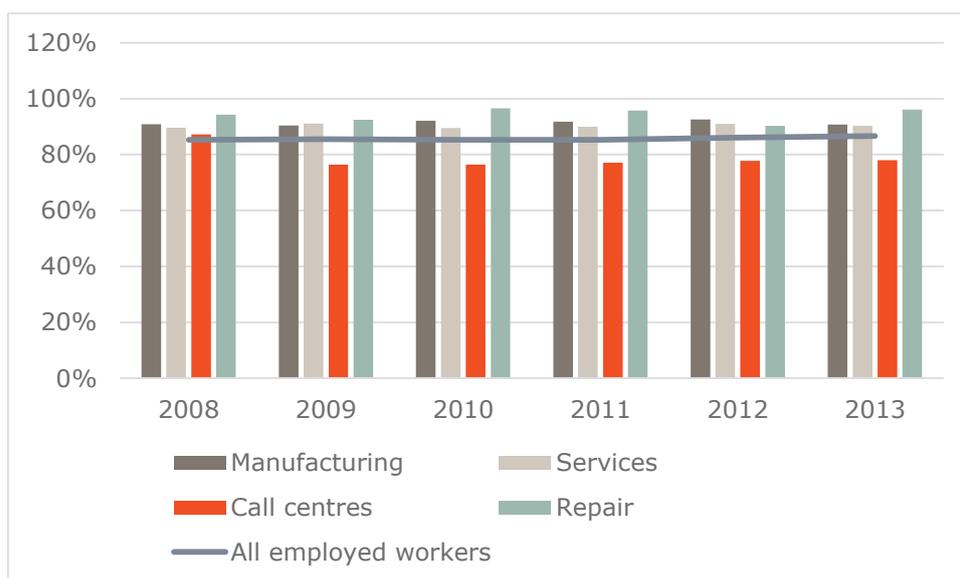*Figure 3-8   Share of full time jobs, 2008-2013*

Source: Own exposition using Labour Force Statistics data and lfsa_epgan2

Note: Includes only workers with working status "Employed"

As Figure 3-8 displays, the share of workers with a full-time contract in Manufacturing, Services and Repair is well above the active employed population. Furthermore, Figure 3-8 displays that in Call centres, the use of part-time jobs are for more than one third of the workers.

The use of temporary contracts is another element in the employment landscape in the telecommunications and ICT sectors. As shown in Figure 3-9 below, the use of permanent contracts in Manufacturing, Services and Repair is at the level of all active population or above. At the same time, temporary contracts are more used in Call centres than in the labour market in general.

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Figure 3-9   Share of permanent contracts, 2008-2013

Source: Own exposition using Labour Force Statistics data and lfsa_etpga

Note: Includes only workers with working status "Employed"

3.5.2   Employment and working conditions

Globalisation, de-regulation and liberalisation of telecommunications and ICT markets (in particular telecommunications) as well as technological progress and internal restructuring has had a significant impact on jobs and working conditions in the telecommunications and ICT sectors.

A first striking effect has been on company size structures. Manufacturing of products and equipment, as well as services, has seen a significant decrease in the average company size.

An analysis of the telecommunications and ICT manufacturing sectors covering the period 2003 – 2008 show that in contrast to overall manufacturing where average company sizes increased due to a reduction of the number of companies (by 2.8%), the number of companies in telecommunications and ICT manufacturing was quite stable (0.7%) though job losses were higher than in manufacturing on average[76].

Taking a look at telecommunications and ICT services, the trend toward smaller company sizes is even more striking. Between 2003 and 2007, the turnover of ICT service sectors increased by 12%, but the number of companies grew by around 40%. This development reflects trends of internal restructuring such as outsourcing of ICT

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[76] Statistisches Bundesamt 2009: Entwicklung der Informationsgesellschaft. IKT in Deutschland, Wiesbaden, p. 11.

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services but also the liberalisation of the telecommunications market and the disintegration of former state monopolies.

The effect of these changes in the business demography is a growing competition between companies and a growing pressure on costs, i.e. the need to continuously restructure and improve productivity. Though the Telecommunication and ICT market is growing, the market shares of companies have decreased due to the emergence of new entrants (both within Germany and from other countries).

These changes, as well as changes with view on framework conditions such as labour law, corporate cultures as well as the overall political environment have resulted in a growing pressure on working conditions as well as on industrial relations in the telecommunications and ICT sectors.

One of the working conditions that are put under pressure in the telecommunications and ICT sectors is the working time. As displayed in Table 3-20 below, a large share of workers work more than 40 hours per week on average. In comparison the average work week in Germany is around 35 hours. Table 3-20 also shows that Repair is the sector where the largest share of workers work more than 40 hours per week and Call centres is the sector where the smallest share work more than 40 hours per week, in part due to Call centres having a shorter work week (50% working less than 40 hours per week) than in the other sectors.

Table 3-20   Distribution of weekly working time, 2013

Sector	-19	20-29	30-39	40-49	50+	Total
Manufacturing	3%	3%	27%	59%	8%	100%
Services	6%	4%	19%	58%	13%	100%
Call Centres	8%	11%	31%	50%	0%	100%
Repair	5%	0%	14%	71%	10%	100%

Source: Own exposition using Labour Force Statistics data.

Note: Includes only workers with working status "Employed"

Furthermore, with view on working conditions, the effects of information technology and more recently the digitalisation of the economy has been addressed by a large amount of literature and research, focussing not only on the telecommunications and ICT sectors but also the impact of the growing use of telecommunications and ICT on manufacturing and services in general. Already in 1996, the EU Commission published a Green Paper highlighting in particular the need to rebalance the increasing employment and work flexibility and security in our labour markets, which they saw as a major challenge in the context of the information society[77].

In Germany, a number of key challenges with a view to employment and working conditions have been highlighted that are not necessarily linked to the

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[77] EU Commission (1996): Green Paper „Living and Working in the Information Society". People First, COM(96) 389., Brussels.

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telecommunications and ICT sectors, but also characterise more general trends as resulting from technological progress and changes in production, services and internationalisation. Though it is hardly possible to interpret the impacts telecommunications and ICT has on jobs, working conditions and labour relations[78] in the context of this study, some key aspects that seem most relevant with view on industrial relations should be highlighted briefly in the following.

Similar to the EU Commission, a High Level Commission of the German Parliament in 1998 stressed the effects of the transformation to the information society. In particular, they noted the likely increase in discontinuous job careers and the blurring frontiers between dependent and self-employment and other forms of non-standard forms of employment. Furthermore, the Commission highlighted the challenges for social security and the need to adapt the system[79].

In retrospect, the assessments and risks that had been highlighted by the EU Commission and the German Parliament have not only been confirmed, but more recent research has underlined a number of further job impacts and working condition effects that currently form the focus of a debate between policy makers, social partners and other labour market actors. Examples are the emergence of new forms of employment that are often linked to Telecommunication and ICT technologies and in particular the internet. Though the growth of new, more flexible and non-standard forms of work are not necessarily linked to the Telecommunication and ICT sectors, they are particularly widespread in services, e.g. solo self-employment, freelancing, crowd-employment, etc.[80]

Also favoured by labour market reforms and employment policy priorities, various forms of solo self-employment (e.g. freelancing, service contract works) was amongst the fastest growing new forms of employment. In 2010, nearly 2.4 million self-employed Germans had no employees which was 56% of all self-employed and 6% of all employed persons. Solo self-employment is particular widespread amongst 'creative industries' and ICT. According to a study on the creative sector in Berlin, around 45% of all employees have been working as self-employed or freelancers in 2009.[81]

Although more flexible forms of work certainly also reflect changing patterns of living conditions and often are linked to individual preferences[82], the emergence of new forms of employment have been assessed by industrial sociologists and trade unions

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[78] In fact, the effects are very complex and have been termed as 'confusing' in a recent discussion paper. See: Mayer-Ahuja, Nicole (2011): Jenseits der „neuen Unübersichtlichkeit". Annäherung an Konturen der gegenwärtigen Arbeitswelt. SOFI-Arbeitspapier, Göttingen

[79] Deutscher Bundestag (Hrsg.) (1998): Deutschlands Weg in die Informationsgesellschaft/ Enquete-Kommission „Zukunft der Medien in Wirtschaft und Gesellschaft; Deutschlands Weg in die Informationsgesellschaft", Bonn, p. 134.

[80] See for example: Koch, Andreas/Rosemann, Martin/Späth, Jochen (2011): Soloselbständige in Deutschland. Strukturen, Entwicklungen und soziale Sicherung bei Arbeitslosigkeit. Studie im Auftrag der Friedrich-Ebert-Stiftung, Bonn; Schwemmle, M./Wedde, P. (2012): Digitale Arbeit in Deutschland. Potenziale und Problemlagen, Bonn.

[81] Manske, Alexandra (2007): Prekarisierung auf hohem Niveau. Eine Feldstudie über Alleinunternehmer in der IT-Branche, München.

[82] See for example the press statement of the ICT employers organsiation: BITKOM (Bundesverband Informationswirtschaft, Telekommunikation und neue Medien) (2010): Berufstätige wünschen sich flexiblere Arbeitsbedingungen. BITKOM-Presseinformation vom 27.04.2010.

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in particular quite critically. Social risks, the lack of job and employment security and the worsening of working conditions (e.g. working time, health and safety, payment issues) have been highlighted.[83]

According to more recent evidence from health and safety surveys, ICT workers are affected by psychosomatic health strains more than other workers are. It has been reported that 40% of IT employees show signs of chronic exhaustion; the usage of anti-depressive medication is 60% higher amongst ICT workers than on average and the usage of psycho-pharmaceutical medication is 90% higher.[84]

The worrying health and safety risks result not only from a worsening of working conditions and contractual arrangements, but from significant changes in the organisation of work and revolutions of work processes, that more recently have been described as "Industry 4.0". Technological processes and in particular the internet based communication and information technology have also increased the possibility to control and compare the 'performance' of individual employees in a way which so far was unknown. The link between Telecommunication and ICT and increased pressure and insecurity of individual employees is very clearly described by the former chief technologist of IBM Germany:

"Digital work represents a revolutionary shift in the organisation of work, because the work done by employees is now in the internet and its quantity and quality is measurable transparent. So far, there are still many office jobs where you give your best eight hours a day, or where you keep up on the assembly line with the given clock. In the digital world, the jobs are often completely decoupled, everyone can work as much he can afford, wishes or regards as necessary. Thereby, the large differences in performance between employees are become more transparent at any time. This creates an unprecedented psychological pressure on managers and workers, because now all are constantly struggling indirectly for ascent and descent, almost like in the 'Bundesliga'. The whole burnout problem arises right here!"[85]

Also, the rapidly acceleration of internationalisation and globalization has resulted in an increased pressure on working conditions, including wages and working time as well as job security. Many jobs in Telecommunication and ICT manufacturing have been outsourced since the 1990s. The Telecommunication and ICT services have experienced different waves of outsourcing that today increasingly involve not only simple tasks but also more qualified work, e.g. in the field of programming and software development, HR functions, financial services or customer relations. Though exact figures are not available, surveys amongst large companies have revealed a

[83] See for example: Keller, B./Seifert, H. (2011): Atypische Beschäftigung und soziale Risiken. Entwicklung, Strukturen, Regulierung. Bonn; Schulze Buschoff, Karin (2012): Gute Arbeit und „neue Selbstständigkeit"; in: Schröder, Lothar/Urban, Hans-Jürgen (Hrsg.) (2012): Gute Arbeit. Ausgabe 2012, Frankfurt, S. 191 – 199; Kämpf, Tobias (2008): Die neue Unsicherheit. Folgen der Globalisierung für hochqualifizierte Arbeitnehmer, Frankfurt/New York, p. 297.
[84] Baumgarten, N./Jäckel, H. et al. 2014: IT und Beschäftigung. Memorandum des Arbeitskreises Informations- und Kommunikationstechnik des IG Metall Bezirks Baden-Württemberg in Zusammenarbeit mit dem Forum Soziale Technikgestaltung, Heidelberg.
[85] Gunter Dueck in 2011, quoted in Schwemmle, M./Wedde, P. (2012): Digitale Arbeit in Deutschland. Potenziale und Problemlagen, Bonn, p. 55.

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significant share of outsourcing, i.e. those parts of the business that are moved to low-cost.

It is quite likely that the trends towards outsourcing has not peaked yet, but will continue or even accelerate in the future. A study on the "offshorability" of German jobs published in 2009 concluded that more than 40% of all jobs at least potentially are able to be moved abroad, of which 11% very easily[86].

These trends of restructuring have not only put a stronger pressure on working and job conditions of individual employees but also have a strong impact on industrial relations in the Telecommunication and ICT sectors.

Outsourcing and the threat to relocate production due to cost factors not only influence the supply-demand correlation on the labour markets, but also the power relationship between capital and labour, to the disadvantage of the latter.[87] According to the Trade Union Advisory Committee (TUAC) at the OECD, employers are frequently using this exit-option as instrument to influence negotiations and collective bargaining processes. Already in 2004, TUAC commented that "The threat of relocation to an offshore site is now the standard ploy in negotiations or in anti-union campaigns ..."[88]

The increasingly real threat to offshore jobs has made the collective regulation of industrial relations within the telecommunications and ICT sectors more difficult On top of this though, the other employment and business trends mentioned above have contributed to an overall situation of industrial relations in the sectors that is extremely heterogeneous, with view on main actors involved, and characterised by a great plurality with view on collective bargaining, standards and practices.

3.5.3 Industrial relations

The German system of industrial relations is based on two pillars: The autonomy of the social partners to conclude collective agreements ('*Tarifautonomie*') and the co-determination ('*Mitbestimmung*') at company level by works councils.

Collective agreements at sector or territorial/regional level have an important role with a view on the regulation of working conditions and wage setting/levels as they establish common rules and competition frameworks with view on labour costs. Furthermore, during the retention period of a collective agreement, industrial action is prohibited and this contributes also to stability.

As collective bargaining is carried out outside the company by employer organisations and trade unions, employers and employees at company level are not involved and hindered by often lengthy and difficult negotiation processes, meaning they can instead concentrate on relevant and company-related tasks. However, working

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[86] Schrader, K. /Laaser, C.F. (2009): Globalisierung in der Wirtschaftskrise: Wie sicher sind die Jobs in Deutschland? Kieler Diskussionsbeiträge Nr. 465, Kiel, p. 3.
[87] See for example: Boes, Andreas/Kämpf, Tobias (2011): Global verteilte Kopfarbeit. Offshoring und der Wandel der Arbeitsbeziehungen, Berlin.
[88] TUAC 2004: Trade, Offshoring of Jobs and Structural Adjustment – The Need for a Policy Response, Paris, p. 3.

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conditions and wage issues are not only regulated at sector level, but also at company level or even at the level of establishments. The conclusion of such 'firm level collective agreements' in fact is a common trend in the German IR system as it increases the flexibility at firm level. Company level collective bargaining also has been growing as a result of a decreasing organizational strength of employers organisations. A growing number of sector level collective agreements include so-called 'opt-out' clauses that foresee firm-level negotiations in case of economic difficulties or other exceptional circumstances.

In companies not covered by a collective agreement at either level, working conditions and payment are regulated in individual labour contracts between the employer and the individual employee. This is typical for small companies, but for larger firms it results in significant administrative works and thus, most of them prefer to conclude company level agreements (as in the case of the trade union).

Though collective agreements only formally apply for employees that are members of the trade union organisation and that have signed the agreement, in most cases all workers of a company that are bound to a collective agreement are covered. The reason is quite simple – employers are not interested in creating a dual level of working and payment conditions that certainly would increase the attractiveness of trade union membership amongst workers. However, non-trade union members do not have any legal claim arising from the collective agreement.

In Germany, in 2012 around 70% of all employees were covered either directly by a collective agreement or indirectly (i.e. the employer applies the regulations though formally not being bound to it.

According to the German labour law, collective agreements take precedence over company agreements and individual labour contracts, and thus can be regarded as the regulation of minimum standards. There is quite a broad – and growing - variety of different types of collective agreements: wage and payment agreements, agreements setting standards for apprenticeship, framework agreements that define minimum standards for working time, holiday and premiums as well as for probation periods, dismissal notices, etc. Furthermore, there are specific collective agreements that could address specific groups (older workers, women and other groups) or topics (old age pensions, qualification, restructuring, etc.).

At the company level, the German labour law provides the framework for information and consultation practice as well as co-determination by employee interest representations by works councils. Works Councils are also responsible to monitor the correct implementation of the collective agreement and legal requirements. Formally, there is a clear separation and dual structure of interest representation at company level by works councils and by trade unions at sector level. In practice however, both systems overlap.

Industrial relations and structures of interest representation in the ICT sector reflect the diverse and sketchy character of the sector as a whole and the lack of a clear demarcation line. This, as well as the fact that parts of the sector is related to manufacturing while other parts are related to the service sector, results in a plurality of actors and interest representation organisations.

With view on collective regulation and social dialogue the very diverse structure of companies according to size (there are large multinational companies with several

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thousands of employees as well as a large number of very small companies) has resulted also in a large variety of practices, coverage by works councils, trade union and employers organisations, etc.

Finally, the ICT sector is rapidly changing, and restructuring of companies is a continuous process that certainly results in further challenges for social partners and interest representations.

Against this, it is important to identify at least the following clusters of companies within the ICT sector, as they are linked to quite different framework conditions, trends and challenges of industrial relations and social dialogue:

- Large manufacturing ICT companies

- Large multinational or national companies providing ICT services

- The formally state-owned telecommunications sector and those private companies rooted in this tradition

- Small companies both in manufacturing and services of the ICT sector.

These types differ significantly with view on the representation of employees and employers by social partners' organisations, the role of institutional social dialogue/coverage by works councils and other institutions of interest representation as well as by collective bargaining at various levels.

In the context of the 'Digital Agenda' that was launched by the German Federal Government in 2014 as a flagship initiative to foster the ICT sector, the German Government in October 2014 organised a high level 'IT Summit' that should serve as the key platform of cooperation between politics, the economy and science with view on strengthening the ICT sector in Germany.

With view on the representatives of business and employers, it is quite striking that only two employer organisations are represented in the various thematic panel groups that are headed members of the government: This is *BITKOM*, perhaps the most representative employer association in the ICT sector and *BITMi* as the main organisation of SMEs in the IT sector.

With view on size and coverage, also *BITMi* - as an association of SMEs in the IT sector - can be regarded as the second largest employer organisation. Members are in particular German software developers and service providers in fields such as data processing, marketing or engineering. *BITMi* claims to have around 1,000 member companies and is also a member of the EU level association PIN-SME.

Certainly also an important and representative employers' association is *eco – Association of the German Internet Economy*. *Eco* was established already in 1995 and currently has more than 700 member companies in Germany, amongst them many multinational companies from all ICT services including the major telecom providers. Eco also was a founding member of the EU association EuroISPA and represents Germany at the Internet Governance Forum and the ICANN General Names Supporting Organisation (GNSO).

Apart from these cross-sectoral and larger associations, there are around a dozen of professional employers' associations covering specific subsectors such as IT, communication technology (the largest one being *AGEV*), broad band communication, IT in the health sector, software, gaming etc.

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An important actor in the field of manufacturing ICT is the *VDE* (*Association for Electrical, Electronic & Information Technologies*), which is an association of professionals and companies. The VDE claims to be one of the largest technical and scientific associations in Europe with more than 36,000 members, of which 1,300 are single companies. The association has 29 branch offices in Germany and also a dependency in Brussels. The VDE is a member of the Convention of National Associations of Electrical Engineers of Europe (EUREL) and the International Electro-technical Commission (IEC) in Geneva.

However, with view on industrial relations, it is important to note that none of these employers and professional associations can be regarded as representative social partners, i.e. they don't have any mandate for conducting collective agreements.

This also relates to the telecommunications sector where no sectoral employer organisation exists and the German member of the EU level organisation ETNO (and thus representation within the EU sectoral social dialogue committee) is carried out by the German Telekom company.

As a hybrid sector comprising both manufacturing as well as service activities, employees in the ICT sector are organised by two major trade union organisations, the metalworkers union *IG Metall* and the service sector trade union *ver.di*. Both unions are members of the Confederation of German Trade Unions, *DGB*.

In principle, the *DGB* has defined rules with view on organizing domains that is oriented along the principle of '*one company – one union*'. When *ver.di* was established in 2000 as a merger of various service sector unions, including the white collar trade union *DAG* (which was not a member of the *DGB*), the following organizational domains were defined:

- Companies providing public telecommunications services, such as on-line services, internet, and call-centres, are organised by *ver.di*.

- Companies that produce telecommunications facilities and software belong to the domain of *IG Metall*.

- Internal network services for a company, such as on-line, call-centres or internet-services, can be organised by the trade union that negotiates collective agreements with the respective company.

In practice, however, definitions are less clear because the structural change within the ICT sector illustrates the growing difficulty in clearly separating manufacturing from service sector activities, or telecommunications from IT. Also, organisational scopes are not always clear as major companies (e.g. IBM, HP, and Siemens) in the ICT sector have changed from mainly manufacturing to ICT or have established their own service sector branches that in the context of outsourcing have been sold to other companies.[89] Against this continuous reorganization and restructuring of the sector,

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[89] An example is T-Systems that was established in 2000 when the Telekom overtook the majority share of the largest German IT service provider debis AG that by was controlled by the automotive company Daimler AG.

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there are also a number of large ICT companies where both the *IG Metall* and *ver.di* are organizing employees and represented in works councils and other forms of employee interest representation as well as involved in collective bargaining at company level. Prominent examples are HP, IBM, Siemens, T-Systems or SAP where both unions are cooperating.

It is important to note that in the ICT sector, two further trade union organisations are important players outside the DGB Confederation, at least in some subsectors.

The trade union *DPV* (*DPVKOM*) mainly organises members in the former state-owned sectors postal services (including banking) and telecommunications and the companies that have emerged from these backgrounds, i.e. the German Post, Postbank and Telekom. The *DPV/DPVKOM* is a founding member of the German civil service trade union confederation *DBB* and thus many members are still civil servants[90] and with view on this organisation domain, interest representation and collective bargaining the trade union is collaborating with *ver.di*.

There is a further trade union that also organises employees in the ICT sector that plays a rather controversial role in German industrial relations, as it is part of the Christian trade unions that in several sectors (most prominently in the temporary agency work sector) have been used by employers to undermine collective interest representation and collective bargaining by DGB trade unions. Such a 'yellow trade union' in the ICT sector is the CGPT ('*Christian Trade Union Postal Service and Telecommunication*'). The CGPT is also mainly active in the privatized companies of the telecommunications and postal services, and its representativeness and thus ability to conclude collective agreements is a controversial topic.

Collective bargaining and social dialogue
The ICT sector and in particular IT services are amongst those parts of the German labour market where the coverage of companies by institutionalised interest representation (works councils, other forms), social dialogue (company agreements) and collective bargaining is very weak.

According to the most recent survey on collective bargaining and interest representation based on a representative survey among around 16,000 companies in 2012, 60% of all employees in Western Germany and 48% in Eastern Germany (no all-German data exist) are covered either by a sectoral collective agreement or by a collective bargaining agreement at company level.

In the IT sector, the respective coverage rates are only 36% in Western Germany and 27% in Eastern Germany. A further result is that company based collective agreements in the IT sector are more widespread than in the overall economy.

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[90] The share of civil servants in former public companies in the telecommunication sector still is significant. For example, the Telekom has around 70,000 employees of which around 40,000 still are civil servants.

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As Table 3-21 illustrates, the coverage of companies is even significantly lower, only 11% of all IT companies in Western Germany and only 3% in the Eastern part of the country are covered by a collective agreement.

Table 3-21   Employees and companies covered by a collective bargaining agreement, 2012

	Sector agreement		Company agreement	
	West	**East**	**West**	**East**
Total companies	32%	18%	2%	3%
Total employees	53%	36%	7%	12%
Companies in the IT sector	8%	1%	3%	3%
Employees in the IT sector	20%	10%	16%	17%

Source: Wilke, Maack and Partner, based on Ellguth, P./Kohaut, S. 2013: Tarifbindung und betriebliche Interessenvertretung: Ergebnisse aus dem IAB Betriebspanel 2012, WSI-Mitteilungen, 4/2013, p. 281-288.

With view on the coverage by works councils and other forms of institutionalised interest representation (e.g. employee speakers, joint committees, etc.), the gap between the IT sector and the rest of the economy is less pronounced/even better as Table 3-22 illustrates.

Table 3-22   Employees and companies having a works council or other forms of employee representation, 2012 (companies with at least 5 employees)

	Works Council	Other forms
Total economy, companies	9%	12%
Total economy, employees	42%	15%
Companies in the IT sector	14%	11%
Employees in the IT sector	44%	11%

Source: Wilke, Maack and Partner, based on Ellguth, P./Kohaut, S. 2013: Tarifbindung und betriebliche Interessenvertretung: Ergebnisse aus dem IAB Betriebspanel 2012, WSI-Mitteilungen, 4/2013, p. 281-288.

The situation with view on institutionalised interest representation and collective bargaining in the ICT sector differs significantly between large companies and smaller ones. While most large companies are covered by institutional structures and practices of employee interest representation, participation in supervisory boards, and collective bargaining agreements at company level, such practice hardly exist in most small companies.

Furthermore, the fact that employees in the ICT sector are white collar, and in general highly qualified with academic degrees, has an influence on labour relations. In particular, in IT service sectors and the internet economy – formerly known as 'new economy' or 'dotcom companies' - trade unions, works councils, and other forms of collective interest representation and negotiation are regarded by employers and also many employees as something that belongs to the 'traditional' economy and thus doesn't really fit into the corporate culture.

Perhaps the most striking example of a large player in this context is *SAP*, the largest IT service provider in Germany (in terms of turnover) and number four worldwide with a global workforce of 65,000 employees. Though employing around 14,000 in

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Germany alone, the company management until 2006 openly has fought any initiative to establish a works council with the argument that there is no need and that such a form of interested representation is not compatible with the corporate culture. Though in 2006, side lined by a public campaign of both the *IG Metall* and the *ver.di* trade unions works councils elections were held, the elected works council was dominated by non-trade union members, which also illustrates the complicated relationship between the management as well as a large majority of employees on one side and trade unions on the other[91].

As in the ICT sector, no employer organisation exists that has a mandate for negotiating collective agreements as to why collective bargaining is taking place at the company level only, often covering only single locations/sites.

- Important topic of collective agreements are wage increase, the definition of wage groups and other wage related aspects

- Second most important topic is working time, in particular flexible working time organisation, premiums, working time accounts, specific arrangements for older workers etc.

- Also an important issue covered by collective agreements is job security, offers for older workers and commitments of the management to job guarantees for trainees

- Further training and qualification an emerging issue

- Health and safety and preventive measures are becoming more and more important (see the agreement between *ver.di* and *IBM* concluded in April 2014).

It is important to note that the overall employment growth of the ICT sector does not imply that restructuring is resulting in redundancies and dismissals. The overall positive employment figures often hide that in particular in the larger companies restructuring programmes and plan result in significant number of dismissals.

- Against this, there are several cases, where trade unions have concluded collective agreements in order to cushion the effects of restructuring and economic dismissals (e.g. recently Atos, T-Systems, other prominent cases in the past are Nokia Network Solutions / Siemens, HP, IBM, Fujitsu, Vodafone or Telekom) – these 'job security' agreements involve various financial and non-financial measures.

In particular with view on restructuring, it is important to stress that collective agreements often are the result of quite strong industrial conflicts, i.e. unions are fighting for them. Quite prominent examples of the IG Metall domain were the historical strike action at the IT producer Digital Equipment (later taken over by Compaq) in 1993 that lasted two weeks, or the nine weeks of industrial strike action at EDS in 2009.

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[91] However, since 2006 the conflictual situation has improved at SAP somehow. In the context of the 2014 works council elections both trade unions have increased their shares and seats in the works councils. Furthermore, they also have been involved (by one external expert) in the negotiations on employee participation and the establishment of an SE works council in the context of the transformation of SAP into a European Company that was concluded by an agreement in May 2014.

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Though no detailed data exist for the ICT sector, there are some general trends with view on collective bargaining and social dialogue outcomes at company level. Against the background of larger restructuring cases, where working conditions of workers affected by outsourcing or relocation have worsened and decisions were taken without any prior information and consultation, as well as conflicts like in the case of SAP, a change of perception of the role of social dialogue, collective bargaining and interest representation is visible amongst employees in ICT companies.

Also a growing public awareness about psychological and other strains of working in the ICT sector (e.g. *'burn out'*) in the context of a growing shortage of qualified personnel in many IT service sectors have resulted in more openness amongst employers and employer organisation with view on the need to improve working conditions, working environments and labour relations.

Also the two major organising unions in the ICT sector, the *IG Metall* and *ver.di* have intensified efforts to increase membership in the sector,[92] to conclude collective agreements at company level and intensify the exchange and dialogue with employer organisations such as *BITKOM*. In the case of restructuring, both unions have organised public campaigns and industrial actions and also increased efforts to become more visible for employees in the sector (e.g. by newsletters, websites and company groups within their organisation).

Though it is difficult to build this on statistical data, these changes have resulted in an increase in trade union membership, as well as incidents of collective bargaining at the level of establishments or companies.

These trends toward an institutionalisation of industrial relations in the ICT sector may also result in sector-level agreements in the future. In January 2014 for example, the regional branch of the *IG Metall* in North-Rhine Westphalia for example was able to conclude the first ever sectoral agreement in the IT service industry that covers the whole sector. This agreement, titled "Framework Agreement IT Services" was concluded with the regional employer organisation in the metalworking section (*Metall NRW*) following a request of the German branch of the French IT provider *Atos*. The framework agreement includes the regulation of working time, defines different wage groups and flexible wage components, and links the wage development in the IT service sector to the wage agreements concluded in the metalworking and electricity sector.

According to the CEO of *Atos* in Germany, the main objective of the management to conclude this agreement was to establish a transparent, harmonised and flexible framework for all 8,500 employees of the company in Germany and abolish the confusing patchwork of different agreements that exist at the level of different sites.[93]

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[92] See for example the special websites of both unions for the ICT sector: http://www.itk-igmetall.de; https://tk-it.verdi.de/. See also the
[93] See the press memo issued by IG Metall NRW: http://www.igmetall-nrw.de/uploads/media/2014_01_09_PM_Atos.pdf.

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With view on *social dialogue* it has to be noted that so far no joint union – employer initiatives in the ICT sector are known. However, against the background of common challenges – anticipating and managing restructuring, health and safety issues, demographic change – there are signals that both social partners are more prepared than in the past to enter into exchange and dialogue.

However, taking into account the quite contrarily positions of the major social partners organisations on key challenges the ICT sector is facing, it is clear that there is still a long way to go.[94]

3.5.4 Summary

The German Government has in 2014 adopted a 'Digital Agenda', which not only includes the telecommunications and ICT sectors but also other sectors, e.g. sectors in the field of media and consultancy. The German stakeholders are in general in favour of a broad definition of the sectors that outset in the OECD concept of the telecommunications and ICT sectors. The Telecommunication and ICT sectors are among the fastest growing sectors in the German economy. On average, employment growth per year between 2008 and 2012 was 3.4% while the overall average was only 0.9%. As a result, the Telecommunication and ICT sectors as a whole created nearly 86,000 additional jobs.

Moreover, the internal structure of the Telecommunication and ICT sectors changed significantly with some sectors experiencing a strong growth in employment while others experienced lower growth. While on an aggregate level, the manufacturing of Telecommunication and ICT products and equipment between 2008 and 2012 lost more than 23,000 jobs, the overall growth mainly resulted from the strong job creation in Telecommunication and ICT services – in particular computer programming, consultancy and related activities created more than 90,000 jobs.

In Germany, a number of key challenges with view on employment and working conditions have been highlighted that not necessarily are linked to the telecommunications and ICT sectors but characterise more general trends as resulting from technological progress and changes in production, services and internationalisation. According to more recent evidence from health and safety surveys, ICT workers are affected by psychosomatic health strains more than other workers are. Furthermore, it is reported that 40% of IT employees show signs of chronic exhaustion; and the usage of anti-depressive medication is 60% higher amongst ICT workers than on average and the usage of psycho-pharmaceutical medication is even 90% higher.

Collective agreements at sector or territorial/regional level have an important role with a view to the regulation of working conditions. As collective bargaining is carried out

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[94] Just one example, in a joint publication of BITKOM and the management consultancy Roland Berger, published in 2007 a number of recommendations are included that demand a radical liberalisation of labour law regulations, in particular with view on dismissals, temporary contracts as well as on thresholds and regulation with view on works councils and co-determination at company level. See: BITKOM 2007: Zukunft Digitale Wirtschaft, Berlin, p. 142-143.

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outside the company by employer organisations and trade unions, employers and employees at company level are not involved, but can concentrate on relevant and company-related tasks. However, working conditions and wage issues are not only regulated at sector level but also at company level or even at the level of establishments. The conclusion of such 'firm level collective agreements' in fact is a common trend in the German IR system. A growing number of sector level collective agreements include so-called 'opt-out' clauses that foresee firm-level negotiations.

3.6   Ireland

3.6.1   Boundaries of the telecommunications and ICT sectors

The findings in the Irish country case study indicate that a definition of the telecommunications and ICT sectors, which is somewhere between the NACE and ITU definitions, will be appropriate. However, the interviewee states that ICT manufacturing and trade should be included in the definition of the sector: "*I do not believe that manufacturing and trade should be there, it is completely separate. Manufacturing and ICT trade should not be included in the definition. The codes listed in Appendix A are better to describe the sector. The definition in 3.1.1 (NACE) covers ICT better. I do not see the manufacturing piece as part of the sector*."

The respondent generally finds that the overlapping parts of the telecommunications and ICT sectors constitute an increasing share of the activities in the sectors: "The sector is moving. Telecommunications in itself is moving very much towards ICT data and networks. There is much emphasis to the IT part. We represent members in telecommunications that are – skill-wise- moving to the ICT sector. There is movement between these two sectors, which is driven by technological developments within software, hardware and innovation work.

Finally, the respondent finds that there is an increasing specialization in the sectors, which makes firms in the telecommunications and ICT sectors increasingly heterogeneous and decreases the feeling of belonging to a particular sector.

In the review of publicly available information, we found that in Ireland, the telecommunications and ICT sectors are quite interlinked and overlapping, as can be seen in the agreed-upon definition of the ICT sector by the Enterprise Europe Network and the Waterford Chamber:[95]

The agreed definition of the ICT sector is based on the following principles:

- For manufacturing industries, for inclusion in the ICT sector, the products of the industry must be intended to fulfil the function of information processing and communication, including transmission and display, and they must use electronic processing to detect, measure and/or record physical phenomena or to control a physical process

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[95] Information, Communication and Technology Sector in Ireland, Enterprise Europe Network, Waterford Chamber, European Commission Enterprise and Industry, 2010.

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- For service industries, the products of an industry must be intended to enable the function of information processing and communication by electronic means.

These definitions make it difficult to distinguish between telecommunications and ICT services, because enabling information processing and communication by electronic means could both entail the provision of physical infrastructure and the software, which manages information flows on the infrastructure and the interface to the final users.

While there are ongoing discussions about how to define the telecommunications and ICT sectors, for official purposes economic data are still according to the NACE groups by Ireland's Central Statistics Office. In the following, Eurostat data on the telecommunications and ICT sectors will be presented, using the NACE-based definition of the sector.

Economic activities of the sectors

Data on the telecommunications and ICT sectors in Ireland are confidential and not available from public sources. Data are only available for some of the sectors and only for some years. Data for all the years 2008-2012 are only available for sectors 61 and 95.1.

Table 3-23 Number of companies 2008–2012

Sector	2008	2009	2010	2011	2012
2630 - Manufacture of communication equipment	-	12	14	17	13
2640 - Manufacture of consumer electronics	7	6	-	-	-
4651 - Wholesale of computers, computer peripheral equipment and software	-	219	202	168	178
4652 - Wholesale of electronic and telecommunications equipment and parts	-	173	194	239	-
61 – Telecommunications	400	372	379	397	396
8220 - Activities of call centres		83	75	39	73
951 - Repair of computers and communication equipment	287	164	233	277	249
Total	**694**	**1,029**	**1,097**	**1,137**	**909**

Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2).

Notes: "-" data not available

As seen from Table 3-23 above, the number of telecommunications companies has decreased by 1% since 2008 (from 400 companies to 396). A noticeable reduction in telecommunications companies took place in 2009, which turned into growth during later years. Similarly, the number of companies in the subsector repair decreased from

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287 in 2008 to 249 in 2012 (15%). In the same period, the business sector as a whole declined by 12%[96].

Information about company size is only available for the telecommunications sector. Data show that the average number of employees per company in the period from 2008 to 2012 was approximately 55. In comparison, the average number of employees in Irish companies was approximately 12 in the same period. Hence, measured in average number of employees per company, the companies in the telecommunications sector was more than four times bigger than the average.

Information on the turnover in the telecommunications and ICT sectors is very limited. Table 3-24 below presents the available information. Due to missing information on some subsectors for some years, the total turnover for the entire sector cannot be used for comparisons over time. The turnover in the telecommunications sector declined approximately 8% in the period from 2008 to 2012. The turnover in sectors, trading in ICT goods, has grown, which is consistent with the increase in the number of companies in these sectors. For comparison, the business sector annual turnover[97] has increased by 2.6% since 2009.

Table 3-24   Annual turnover, 2008–2012 – million EUR, adjusted for inflation by HICP (2011=100)

Sector	2008	2009	2010	2011	2012
2630 - Manufacture of communication equipment	-	182	229	205	132
2640 - Manufacture of consumer electronics	257	165	-	-	-
4651 - Wholesale of computers, computer peripheral equipment and software	-	4,731	5,651	5,572	6,340
4652 - Wholesale of electronic and telecommunications equipment and parts	-	2,913	3,862	4,132	
61 – Telecommunications	5,979	5,409	5,391	5,733	5,545
8220 - Activities of call centres		542	466	595	518
951 - Repair of computers and communication equipment	106	72	89	85	98
Total	**6,341**	**14,015**	**15,688**	**16,320**	**12,632**

Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2).

Notes: "-" data not available.

In sector 61, the turnover has fallen by 7%, and in sector 95.1, it has decreased by 8%.

The turnover per employee is approximately 1.5-2 times larger than the average company turnover per employee in Ireland. Hence, the companies in the

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[96] Data for 2008 is not available.
[97] Adjusted for inflation by HICP (Harmonised indices of consumer prices), base year is 2011.

telecommunications sector are characterised by a higher average number of employees and a higher turnover per employee than other Irish companies.

3.6.2   Employment and working conditions

According to the 2010 employment figures of Central Statistics Office Ireland, over 74,000 people are employed by ICT companies in Ireland[98]. As a relatively young sector in Ireland, however, it experiences a pressing issue in terms of an appropriately educated workforce. Indeed, the high-tech manufacturing branch reports a 49% gap in technical skills and a 47% gap in "other engineering" skills[99]. The ICT industry in Ireland also experiences deficiencies in IT project management, and lacks ICT professionals with business management skills. Also, as the sector is becoming increasingly internationalised, there is a growing demand for ICT professionals with foreign language skills.

That being said, Ireland has in recent years become a major actor on the global IT scene; for example, it is the second largest exporter of computer and IT services in the world[100]. Not only are there a large number of well-established global leaders such as Intel, HP, Microsoft and Apple, but newer "giants" (Google, Facebook, PayPal, eBay, Twitter) have also established operations in Ireland. This is partly due to a highly skilled labour force but also due to the attractive tax and company legislation conditions in Ireland.

The main ICT professions in Ireland are electronics engineer, software engineer, computer/IT consultant, computer analyst/programmer, application developer, database administrator, information systems manager, IT Trainer, multi-media programmer, systems/business analyst, technical support office (IT), information scientist, IT sales professional, multi-media specialist, network engineer, and technical author. Hence, the main professions are characterized by being relatively knowledge intensive.

The knowledge intensiveness of the main professions is only visible when looking at the educational level of the workers in the telecommunications and ICT sectors. Figure 3-10 below shows the educational distribution in 2013 for employees in the ICT service sector and for all employees in Ireland.

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[98] Information, Communication and Technology Sector in Ireland, Enterprise Europe Network, Waterford Chamber, European Commission Enterprise and Industry, 2010.
[99] Information, Communication and Technology Sector in Ireland, Enterprise Europe Network, Waterford Chamber, European Commission Enterprise and Industry, 2010.
[100] Enterprise Ireland, Information & Communications Technology sector profile.

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Figure 3-10   Educational distribution, 2013
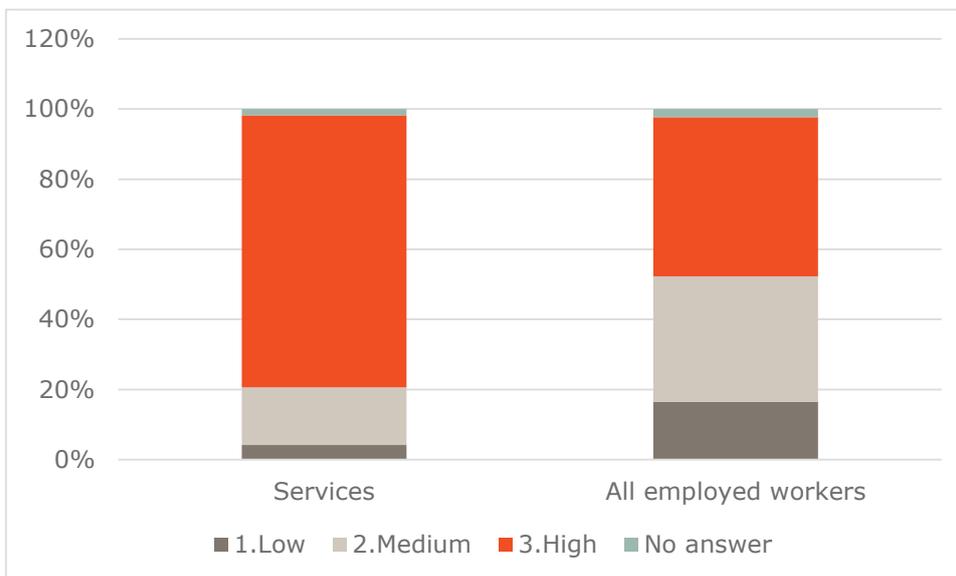
Source: Own exposition using Labour Force Statistics data and Eurostat (lfsq_egaed)

Note: Data are only available for 61 - telecommunications and 62 - computer programming, consultancy and related activities. Low is defined as less than primary, primary and lower secondary (levels 0-2), medium is defined as upper secondary and post-secondary non-tertiary (levels 3 and 4) and high is defined as short-cycle tertiary, bachelor or equivalent, master or equivalent and doctoral or equivalent (levels 5-8).

As Figure 3-10 displays, almost 80% of workers in ICT services are at the highest educational level, the corresponding figure is only around 45% for all Irish employees.

Traditionally, Ireland has had very predominant mining and chemical industries, which used to contain the best-paid jobs. The best-paid jobs are now found in the IT sector and in the financial sector. The telecommunications sector also pays above-average salaries[101]. Naturally, the median yearly salaries vary across jobs and level of skills required. The average salary of a senior software engineer amounts to EUR 61,238, while for a network engineer, it amounts to EUR 35,000[102]. In telecommunications, there are also considerable variations in salaries. A project manager can expect salaries of EUR 62,288, while a computer-aided design technician can expect EUR 28,938[103].

The stakeholder interviewed finds that jobs in the telecommunications and ICT sectors are more secure that other jobs in the Irish economy, but that job security in the

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[101] Just landed, Working in Ireland, http://www.justlanded.com/english/Ireland/Ireland-Guide/Jobs/Working-in-Ireland.
[102] http://www.payscale.com/research/IE/Industry=Information_Technology_(IT)_Services/Salary.
[103] http://www.payscale.com/research/IE/Industry=Telecommunications/Salary.

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telecommunications and ICT sectors has deteriorated in recent years. The stakeholder does not think that working time has changed in recent years whereas salaries may have been negatively affected by the recession.

Only limited data are available on the working week of employees in the Irish telecommunications and ICT sectors. The Labour Force Survey only contains data for the ITC service sector, but this includes both telecommunications consultancy and data processing and hosting. For ICT services, the share of employees, who work more than 40 hours per week, has grown from about 41% in 2008 to approximately 54% in 2013, as can be seen from Table *3-25* below. The average working week in Ireland is 35.4 hours[104].

Table 3-25   Share of employees working more than 40 hours a week, %

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**% change 2008-2013**
Services	41%	43%	43%	48%	52%	54%	29%

Source: Own exposition using Labour Force Statistics data.

The share of employees on permanent contracts is an indicator of job safety in the sector. Data from the Labour Force Survey indicate that more than 90% of employees in the ICT services are employed on permanent contracts; cf. Table *3-26* below. There appears to be a decline in the share of employees on permanent contracts in the period from 2008 to 2013. Furthermore, as indicated in Table *3-26* below, the total share of workers with permanent contracts in Ireland is somewhat lower than in ICT services.

Table 3-26   Share of employed persons on permanent contracts, %

	2008	**2009**	**2010**	**2011**	**2012**	**2013**
Services	97%	96%	97%	95%	94%	93%
Total employed	92%	91%	90%	90%	90%	90%

Source: Own exposition using Labour Force Statistics data.

3.6.3   Industrial relations

The character of industrial relations has changed in Ireland over the last two decades. Ireland is one of the few EU Member States where employers can choose to recognise (or not) the trade union in their workplace. . According to the stakeholder interviews, many of the new companies in the ICT and Telecommunications sectors do not have a positive view on unions. He puts it in this way: "*It has happened because of the new companies that are appearing and they have not had union organisation in the past. Those companies think that trade unions in themselves are bad. So, we have difficulties to organise in these companies. In the traditional companies, the trade*

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104 Source Eurostat (lfsa_ewhun2)

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*organisation is still in place. It is a little harder to organise in the new IT part of the
sector.*"

Collective bargaining and social dialogue

Individual employment law mostly covers only basic workers' rights; collective
bargaining therefore still has an important role in negotiations on enhanced terms,
such as extended redundancy terms. The collective bargaining rate is estimated to be
about 44%[105]. Collective bargaining is mostly dominant at company level. At the
national level, it is considered important, while on the sectoral level it has no
importance.

Over the last 14 years, the density of trade unions in Ireland has generally declined.
In 2013, the density of trade unions across all sectors was 30%[106].

Ireland's recent good economic and social performance, partly thanks to the
development of the ICT sector, has taken place in a context of effective social
partnership practices. This has significantly contributed to raising awareness of the
incentive of involving employer and trade unions in economic and social policy-
making.

Ireland has developed tripartite approaches to the negotiation of central agreements
on social and macroeconomic issues. This goes back to the centrally negotiated
tripartite agreement of 1987, the "Programme for National Recovery", which paved
the way for a new tradition of tripartite social dialogue. Following this development,
the issues covered by the collective bargaining agreements have considerably
expanded. The focus shifted from economic competitiveness towards social inclusion
and employment. Before 2000 agreements went even further and covered social and
developmental issues such as living standards, workplace environment, balanced
regional development, rural development, local governance, equality, and lifelong
learning[107]. Today, however the situation is different especially after the dramatic drop
in employment caused by the 2008 economic crisis, which hit the ICT manufacturing
industry in Ireland badly. Ireland continued to experience job losses up to 2012, but
has also seen some employment gains in specific industries, such as the information
industries.

As an example it should be mentioned that one of the main trade unions, Unite,
describes their role in collective bargaining as follows:

- Unite is actively working to ensure that our members in the sector are treated
  properly by their employers, whilst demonstrating that the mythical general sales
  pitch within the industry that you are better as an individual is dispelled.

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105 EIRO-Online, 2014, http://www.eurofound.europa.eu/eiro/country/ireland.pdf.
106 OECD, 2014, Trade Union Density, stats.oecd.org.
[107] Trade unions and social dialogue: current situation and outlook, Labour Education 2000/3 No. 120, ILO.

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- Unite has a proven record in the sector of enhancing the terms of members where we act collectively and ensuring that, where there are individual members, employers are unable to use individualism to the detriment of the member.

- Unite has committed itself to the principal of fairness to all by campaigning successfully on many issues that have benefitted the membership.

3.6.4 Summary

The findings in the Irish country case study indicates that a definition of the telecommunications and ICT sectors, which is somewhere between the NACE and ITU definitions, will be appropriate.

The turnover per employee is approximately 1.5-2 times larger than the average company turnover in Ireland. Hence, the companies in the telecommunications sector are characterised by a higher average number of employees and a higher turnover per employee than other Irish companies.

Generally the findings indicate that jobs in the telecommunications and ICT sectors are more secure than other jobs in the Irish economy, but that job security in the telecommunications and ICT sectors has deteriorated in recent years.

Individual employment law mostly covers only basic workers' rights; collective bargaining therefore still has an important role in negotiations on enhanced terms, such as extended redundancy terms. The collective bargaining rate is estimated to be about 44%[108]. Collective bargaining is mostly dominant at company level. At the national level, it is considered important, while on the sectoral level it has no importance.

3.7 Czech Republic

3.7.1 Boundaries of the telecommunications and ICT sectors

The telecommunications and ICT sectors in the Czech Republic have undergone a significant change in the last 15 years. They now comprise some of the main economic sectors in the Czech economy and they continue to grow in size. In the Telecommunication and ICT sectors, ICT services play the most important role. On average, the turnover of the ICT services has grown by 12 to 26% annually, e.g. around three times faster than the GDP in the Czech Republic (Budoucnost profesí, 2014). Along with the annual turnover, there has been a substantial growth in employment in the sector.

According to the official Czech statistics (Czech Statistical Office, 2012) the telecommunications and ICT sectors include both ICT manufacturing and ICT services. From this perspective, a broad definition of the sectors is supported by the Czech Republic.

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[108] EIRO-Online, 2014, http://www.eurofound.europa.eu/eiro/country/ireland.pdf.

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In the following sections, data are, where relevant, presented broken down into manufacture, services and trade. Regarding the relevant timeframe, the development in the telecommunications and ICT sectors is illustrated from 2008 to 2012. The 2012 data are, however, only preliminary.

Economic activities in the sectors

Figure 3-11 shows the development in the number of companies from 2008 to 2012. The growth in the number of companies was approximately 9% corresponding to a growth from 29,931 to 32,533 companies. IT services have contributed most in terms of absolute growth, as there were approximately 2,000 more companies in IT services in 2012 compared with 2008. In terms of relative growth, trade in ICT goods has grown the fastest, by approx. 25%.

Figure 3-11   Number of Companies, 2008-2012
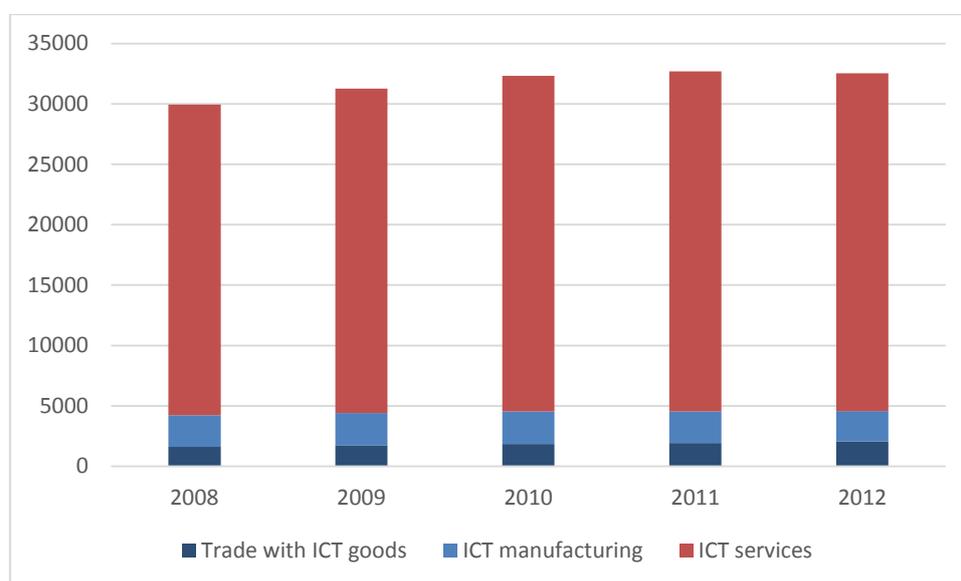
Source: Czech Statistical Office, ICT0220UC

Looking at the average company size, the figures show that the average number of employed per company is around 10 in ICT manufacturing, six in trade with ICT goods and three in ICT services. The companies in ICT manufacturing are thus on average twice as big as the average company size in Czech Republic while the companies in trade with ICT goods are about the same size and the companies in ICT services are smaller.

The annual turnover for the companies within the telecommunications and ICT sectors has declined from 2008 to 2012, with a tendency for stabilization at the end of the period. In 2008, the total turnover was approximately EUR 253 billion. In 2012, it was approximately EUR 235 billion.

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Figure 3-12   Annual turnover, 2008–2012, 2011 million EUR

Million Euro
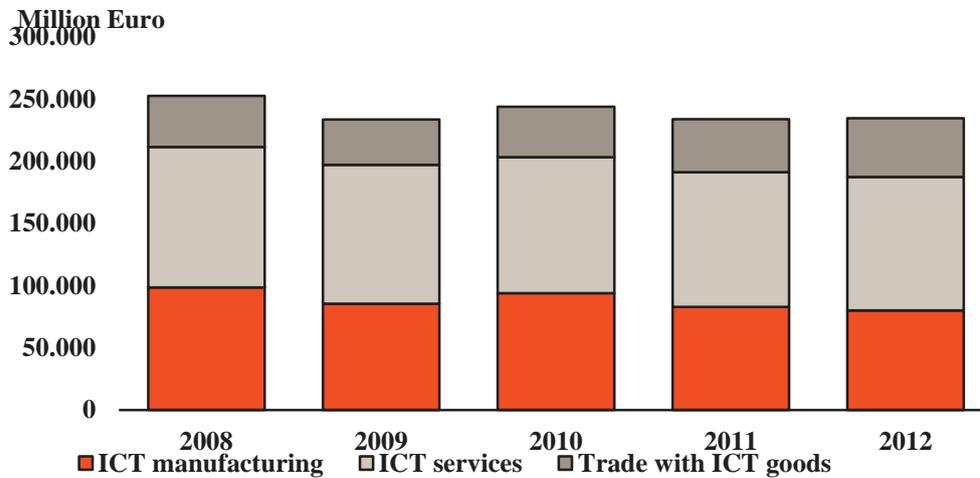
Source: Czech Statistical Office, ICT0220UC

3.7.2   Employment and working conditions

Figure 3-13 shows the development in the number of employees in the period from 2008-2012. The employment in the ICT and Telecommunications sectors has declined from 143,044 in 2008 to 140,643 in 2012. In ICT manufacturing, employment has declined from 39,737 to 27,392, whereas employment has increased in services and trade. Employment in ICT services grew from 92,597 in 2008 to 101,613 in 2012. In trade with ICT goods the employment grew from 10,710 to 11,638. In 2010, there were 4.9 million employed persons in the Czech Republic, which means that employment in the ICT and Telecommunications sectors constitutes in the neighbourhood of 3% of the total employment.

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Figure 3-13   Number of employees, 2008-2012
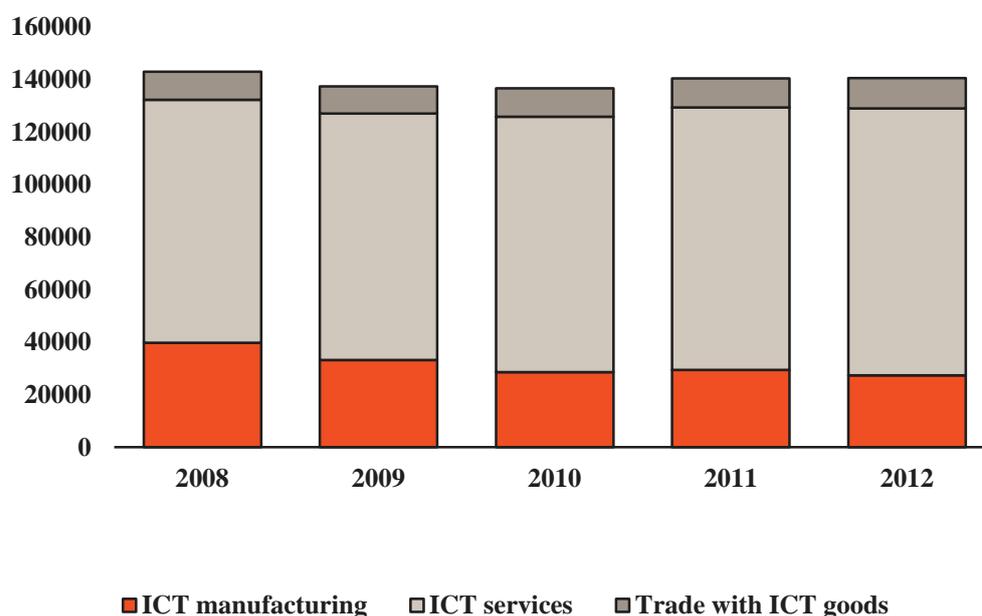
Source: Czech Statistical Office, ICT0220UC

As regards the share of employees within the different parts of the telecommunications and ICT sectors, in 2012 the majority of workers were employed within IT services (82,916 employees). This corresponds to 59% of the total employment within the entire Telecommunication and ICT sectors. IT services were followed by telecommunications with the total of 18,697 employees (13% of the total ICT employment). Figure 3-14 below shows the share of the different subsectors in the total ICT employment.

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Figure 3-14   Share of employment 2012
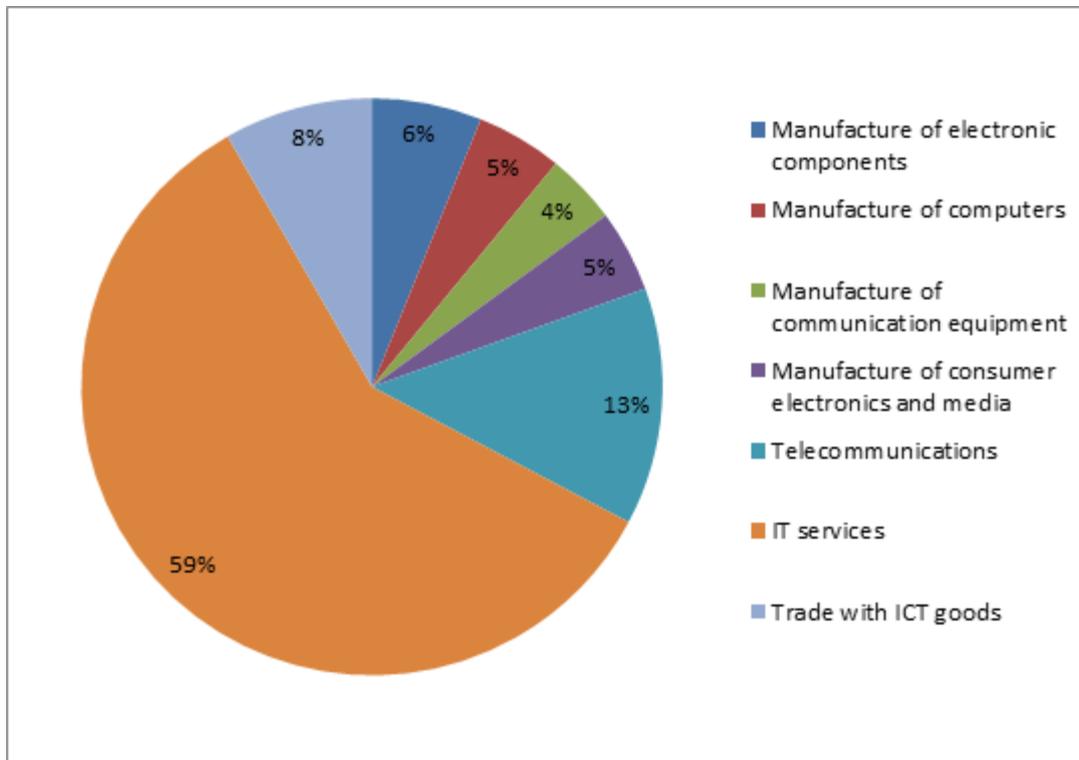
Source: Czech Statistical Office, ICT0220UC.

The average salary for an IT worker as of 2008 was CZK 43,703 (~EUR 1,594) per month (Czech ICT Alliance, 2014).

For working conditions, we consider hours of work and the share of employed persons, who are working on permanent contracts. We looked in ILO for data on work-related illness and for the periodical earnings, but no sufficiently disaggregated information for such analysis were found.

The available data on working hours for employees in the ICT and Telecommunications sector indicate quite different developments in the subsectors. In the ICT manufacturing and service sectors, the share of workers, who work more than 40 hours per week, appears to have declined a little. On the other hand, in call centres and ICT repair, the share of workers, who work more than 40 hours per week, has increased markedly. It has not been possible to obtain data on the trade in ICT sector. The average work week in the Czech Republic was 35.3 hours in 2013[109].

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[109] Source Eurostat (lfsa_ewhun2)

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Table 3-27   Share above 40 hours of weekly working hours, %

	2008	2009	2010	2011	2012	2013	% change 2008-2013
Manufacturing	87%	81%	87%	87%	88%	86%	-1%
Services	92%	91%	90%	91%	90%	91%	-1%
Call centres	57%	59%	90%	85%	67%	76%	33%
Repair	87%	100%	94%	88%	94%	100%	15%

Source: Own exposition using Labour Force Statistics data.

With respect to the share of employed workers on permanent contracts, the ICT and Telecommunications sectors are close to the average for all Czech employed persons. 90-93% of the employees in ICT manufacturing and services work on permanent contracts. In the subsector of call centres, the share is less, though it varies much from year to year.

Table 3-28   Share of employed persons on permanent contracts, %

	2008	2009	2010	2011	2012	2013
Manufacturing	95%	91%	89%	90%	92%	90%
Services	94%	95%	92%	93%	92%	93%
Call centres	76%	63%	100%	59%	56%	67%
Repair	97%	100%	92%	91%	94%	96%
All employed	92%	92%	91%	92%	91%	90%

Source: Own exposition using Labour Force Statistics data and Eurostat (Lfsa_etpga)

Some sectors within the telecommunications and ICT sectors are very knowledge intense, while others are not. This can be illustrated by Figure 3-15 below which shows the educational distribution in the different sectors and for all workers in the Czech Republic.

Figure 3-15   Educational distribution, 2013
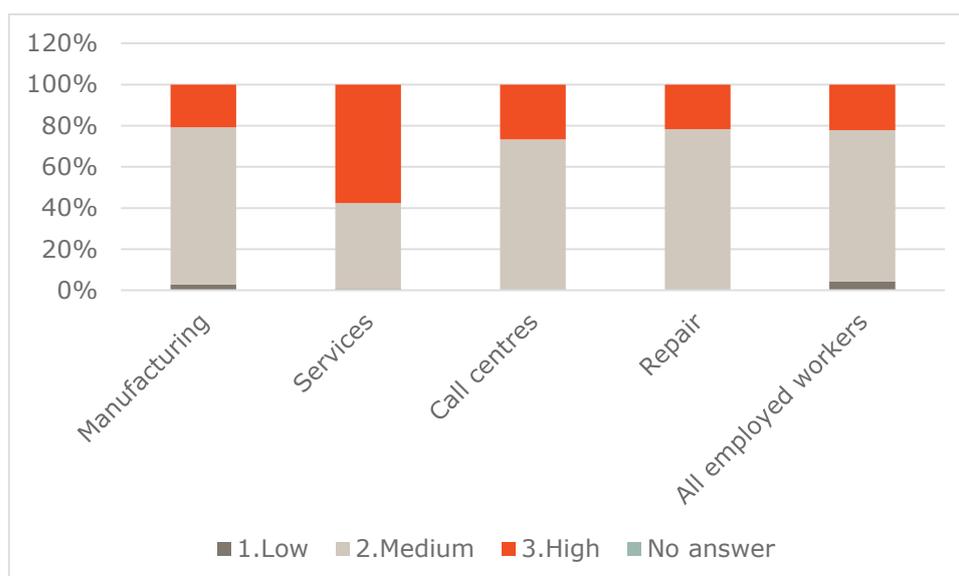
Source: Own exposition using Labour Force Statistics data and Eurostat (lfsq_egaed)

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Note: Data are only available for 61 - Telecommunication and 62 - Computer programming, consultancy and related activities. Low is defined as less than primary, primary and lower secondary (levels 0-2), medium is defined as upper secondary and post-secondary non-tertiary (levels 3 and 4) and high is defined as short-cycle tertiary, bachelor or equivalent, master or equivalent and doctoral or equivalent (levels 5-8).

As Figure 3-15 displays, the highest educational level is found among workers in 'Services' with approximately 58% of workers belonging to the category with the highest educational level. Compared with all employees in the Czech Republic, the share of workers having the highest educational level is more than twice as high in Services. In Manufacturing, Call Centres and Repair, the educational levels of workers are at the same level as for all employees in the Czech Republic.

3.7.3   Industrial relations

Collective bargaining and social dialogue
Collective bargaining coverage in the Czech Republic is relatively low (37%; Czech Statistical Office, Structure of Earnings Survey, 2011). Generally, social dialogue in the Czech Republic takes place at three levels:

- at the highest level: between representatives of the State, workers and employees. At this level, the dialogue revolves around the functioning of tripartite bodies, conclusion of general agreements and other conceptual issues.

- at industry level: between trade unions and employer organisations. Apart from issues of common interest, social dialogue at industry level leads to the conclusion of industry-level collective agreements. Industry-level collective agreements can be extended under the conditions laid down in Law 2/1991 Coll. to all employers with prevailing activities within the relevant industry sector, regardless of whether a trade union has established activities within that particular employer. The practice of extending industry-level collective agreements is, however, rather limited in the Czech Republic[110].

- at company level: between one employer and one or more worker organizations established within the employer leading to the conclusion of company-level collective agreements.

In the Czech Republic, collective bargaining takes place primarily at company level, and the majority of collective agreements are concluded at this level. Industry-level collective agreements cover only telecommunications and the electrical and electronic part of the telecommunications and ICT sectors.

The prevalence of company-level collective bargaining results primarily from the fact that employers do rarely form organisations that participate in collective bargaining. This can be perceived as an expression of the fragmentation of the sectors in terms of employers. Within telecommunications and ICT services, small enterprises (i.e. enterprises with less than 50 persons employed) prevail. In 2012, 99.1% of

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[110] eironline, 2007

companies in the telecommunications and ICT service sectors fell within the category of small enterprises. In contrast, only 0.2% of the companies had more than 250 persons employed. This share has not changed substantially from 2008, from which detailed data regarding the size of companies within the sectors are available.

Since the early 1990's, the telecommunications and ICT sectors have undergone profound restructuring. The first step in the series of developments throughout the 1990's was the division of the prior state monopoly within post and telecommunications, SPT Praha s.p., into two state-owned businesses, SPT Telecom (for telecommunications) and Česká pošta (for postal services), and, hence, the subsequent transformation of the former into a public limited liability company Český telecom a.s. Workers working within the fields of the former state monopoly nonetheless remain organised in the same organisation (*Czech Union of Postal, Telecommunications and Print Distribution Sector Employers).*

The 2011 industry-level collective agreement is binding for all employers organised within the Union. Company-level collective agreements building upon the industry-level collective agreements have been concluded within some of the employers. These employers include:

- Česká pošta s.p. (Czech postal services): from 2011 to 2013 and, subsequently, extended until the end of 2014

- Telefónica O2 Czech Republic: from 2007 to 2013 and extended until the end of 2014

- T-Mobile Czech Republic: for the period from 2014-2018

- Vegacom: from 2013 to 2014

- and – as regards the distribution of press - Holdingová společnost První novinová společnost a.s., Novinová a poštovní s.r.o. and Podniková kolektivní smlouva Poštovní tiskárny cenin Praha a.s.

The industry-level collective agreement concluded between the EIA and KOVO (see above) applies only with respect to those employers, who consented to it. Of the EIA's 49 members, only 11 are bound by the industry-level collective agreement.

The *Trade Union of Employees in Postal, Telecommunications and Newspaper Services* has contributed to establishing a system consisting of a number of long-term collective agreements. This system contains both agreements at the industry and at the company level.

At the industry level, collective agreements were concluded with the Czech Union of Postal, Telecommunications and Print Distribution Sector Employers. The current industrial collective agreement applied from 1 April 2006 to 31 March 2014 and covered the following issues:

- access to information and the right to be informed and the obligation to inform

- employment (employment policies, layoffs in connection with organizational changes)

- labour issues (employment contracts, working time and overtime, annual rest periods, labour impediments, etc.)

- wages (remuneration, tariff wages, bonuses and travel bonuses)

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- social issues (health care, insurance, voluntary pension insurance, assistance to workers with special needs, etc.)

- working conditions and occupational safety and health

- rights of workers organizations (conditions for the functioning of worker organisations, right to participate in decision-making, consultations, etc.).

Every year the Union discusses the minimum wages for workers in the form of minimum wage tariffs, premiums for night work and overtime work and work during weekends and bank holidays. To this effect, an annex is attached to the industrial collective agreement.

Collective agreements at company level, derived from the industry-level agreement, regulate a wide range of labour and social issues. These issues include rather complex remuneration systems aimed at ensuring wage increase and improvement of working and social conditions for the workers.

The EIA and the trade union for metal industries workers, KOVO, have concluded an industry-level collective agreement. The agreement is applicable for the period from 2013 to 2014 and addresses issues such as remuneration, social rights, organisation of employment relationships and occupational health and safety issues.

3.7.4 Summary

The definition of the telecommunications and ICT sectors in the Czech Republic are rather broad and the findings indicates that a definition close to the ITU definition is used.

The annual turnover for the companies within the telecommunications and ICT sectors has declined from 2008 to 2012, with a tendency for stabilization at the end of the period. In 2008, the total turnover was approximately EUR 253 billion. In 2012, it was approximately EUR 235 billion.

Working hours for employees in the ICT and Telecommunications sector indicates quite different developments in the subsectors. E.g. in call centres and ICT repair, the share of workers, who work more than 40 hours per week, has increased significantly.

Collective agreements at company level, derived from the industry-level agreement, regulate a wide range of labour and social issues. These issues include rather complex remuneration systems aimed at ensuring wage increase and improvement of working and social conditions for the workers.

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3.8   Portugal

3.8.1   Boundaries of the ICT- and telecommunications sectors

The Companies Association for an Innovation Network (Inova-Ria), together with the National Association of Information Technology and Electronics Firms (ANETIE) have contributed to the development of Portugal's telecommunications and ICT sectors. In its Prospective Study of the ICT sector (Inova-Ria, 2013); the Inova-Ria has defined the Portuguese ICT subsectors as the economic activities within:

▪ *Telecommunications*: wire and cable industry and manufacturers of communications equipment, telecommunications operators and companies that provide support;

▪ *Electronics and Hardware:* companies manufacturing computers, servers, storage systems; and

▪ *Information Systems:* software and information systems development companies, consultancy companies in information systems and business solutions.

The Portuguese Society of Information[111], on the other hand, has defined the sector according to the following NACE Rev 1. codes:

▪ *ICT manufacture* (30.01, 30.02, 31.30, 32.10, 32.20, 32.30, 33.30),

▪ *Telecommunications services* (64.20)

▪ *Other ICT services* (51.43, 51.64, 51.65, 71.33, 72.10, 72.20, 72.30, 72.40, 72.50, 72,60)

The Portuguese employee organisations are not organised around the services and activities within the telecommunications and ICT sectors, but instead around the enterprises providing a wide range of services that are considered to be included in the sectors, e.g. STPT, which organises workers employed by the Portugal Telecom.

The interview respondents have differing views on the definitions of the sector. Among the three interviewed employee organizations, two organizations responded that the NACE definition[112] is appropriate, whereas the third responded that it is not appropriate. One of the employee organizations states a clear preference for the ITU definition[113], whereas another states a clear preference for the narrow NACE definition. The third does not state a clear preference. Two of the three employee organizations state that they believe cable TV should be included in the definition of the sector.

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[111] The Portuguese Society of Information is a government sponsored agency that has registered the use of ICTs in the Portuguese public sector.
[112] "The production (goods and services) of a candidate industry must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display" These activities can be encompassed by the following NACE codes: 26: Manufacturing, 46: Trade, 58: Services, 61: Telecommunications, 62: Computer programming, consultancy and related activities, 63: Information service activities, and 95.1: Repair.
[113] "ICT products must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display".

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The two employer organizations, however, seem to prefer the ITU definition. One respondent state: "This definition[114] is more complete, since it includes areas connected to the means of communication. There are no excluded activities in this definition."

The respondents agree that the activities of the ICT and Telecommunications sectors are becoming increasingly overlapping. An example of a response is "The telecommunications operators invade the ICT sector (content, cloud, etc.) while the actors in the ICT area are starting to invade a component of the telecommunications. There is interpenetration between sectors and actors." Another example is "The activities in the sectors are transversal to all other sectors and economic activities. There is a strong overlap between activities, since all sectors have uses in ICT technologies."

Furthermore, the respondents agree that the activities of firms in the sectors are becoming increasingly heterogeneous. Most respondents point to increasingly specialized customer demands as the reason for increasing specialization and heterogeneity. Some respondents point to the technological development as the source of increasing heterogeneity.

In summary, both the desk research and the interviews lend support to the hypothesis of increasingly blurred boundaries between the ICT and Telecommunications sector. The literature, which was found, does not all agree with the present NACE definition of the sector. The interview respondents find that the activities are overlapping between industries and are increasingly heterogeneous within industries.

Economic activities of the sectors

Table 3-29 below shows that the number of companies in the telecommunications and ICT sectors has decreased by 3% since 2008 but has increased by 3% since 2010. In comparison, the total number of companies[115] in Portugal has decreased by 12% since 2008.

Table 3-29   Number of companies 2008–2012

	2008	**2009**	**2010**	**2011**	**2012**
2611 - Manufacture of electronic components	100	88	85	81	76
2612 - Manufacture of loaded electronic boards	6	8	12	14	21
2630 - Manufacture of communication equipment	85	79	67	66	61
2640 - Manufacture of consumer electronics	48	44	34	35	33
2680 - Manufacture of magnetic	0	0	0	0	0

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[114] The ITU definition.
[115] Total business economy; repair of computers, personal and household goods; except financial and insurance activities

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	2008	2009	2010	2011	2012
and optical media					
4651 - Wholesale of computers, computer peripheral equipment and software	642	601	569	550	530
4652 - Wholesale of electronic and telecommunications equipment and parts	635	630	617	606	610
5821 - Publishing of computer games	23	19	15	15	15
5829 - Other software publishing	365	336	312	300	313
61 – Telecommunications	381	481	523	619	656
62 - Computer programming, consultancy and related activities	9.109	8.685	8.394	8.485	8.430
631 - Data processing, hosting and related activities; web portals	511	530	537	613	653
8220 - Activities of call centres	65	58	56	58	66
951 - Repair of computers and communication equipment	449	501	537	573	593
Total	12.419	12.060	11.758	12.015	12.057

Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2).

This overall development represents a trend earlier identified by Peixoto et al. (2003) in which the expansion of the telecommunications and ICT sectors has given place to a recession, where "firms are following cost containment policies. This reality turns less probable for the hiring of labour, either national or foreign, as well as the internationalisation of activities" (Peixoto et al., 2003:6). Yet, the slight increase in the number of companies in the telecommunications and ICT sectors suggests that programs to incentivize technological development, e.g. the Global Entrepreneurship Monitor project, have succeeded to some extent.

Looking across the different subsectors, the data indicate large differences between the subsectors. The number of companies in manufacturing has declined by 20%, trade has declined by 11% and services have declined by 3%. On the other hand, the number of companies in repair has increased by 32%. The number of companies in the call centres-subsector is almost the same at the beginning of the period as at the end.

Table 3-30   Number of companies in subsectors, 2008–2012

	2008	2009	2010	2011	2012
Manufacturing	239	219	198	196	191
Trade	1.277	1.231	1.186	1.156	1.140
Services	10.389	10.051	9.781	10.032	10.067
Call centres	65	58	56	58	66
Repair	449	501	537	573	593
Total	12.419	12.060	11.758	12.015	12.057

Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2).

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The number of employees per company differs largely between the different subsectors. The subsectors with the highest number of employees on average are Telecommunications (around 75) and Call centres (around 225). In comparison, the average company size measured in number of employees is 5. The smallest company size can be found in Computer Programming, Consultancy and related activities, where the average is 3 employees per company.

The **annual turnover**[116] for companies in the telecommunications and ICT sectors has decreased every year since 2008 and in total by 24% from 2008-2012. In the same period, total business sector turnover has decreased by 11%.

Table 3-31   Annual turnover, 2008–2012 – million euros, adjusted for inflation by HICP (2011=100)

	2008	**2009**	**2010**	**2011**	**2012**
2611 - Manufacture of electronic components	1.445	527	141	83	89
2612 - Manufacture of loaded electronic boards	4	13	18	18	18
2630 - Manufacture of communication equipment	149	168	237	246	224
2640 - Manufacture of consumer electronics	522	738	889	951	851
2680 - Manufacture of magnetic and optical media	0	0	0	0	0
4651 - Wholesale of computers, computer peripheral equipment and software	2.153	1.952	1.628	1.288	1.087
4652 - Wholesale of electronic and telecommunications equipment and parts	1.464	1.464	1.380	1.258	1.220
5821 - Publishing of computer games	1	1	1	1	1
5829 - Other software publishing	214	213	216	196	183
61 – Telecommunications	8.015	7.957	7.689	6.597	6.159
62 - Computer programming, consultancy and related activities	3.181	3.262	3.215	3.078	3.012
631 - Data processing, hosting and related activities; web portals	290	308	324	339	273
8220 - Activities of call centres	248	268	322	279	271
951 - Repair of computers and communication equipment	87	77	92	109	96
Total	17.773	16.949	16.152	14.443	13.485

Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2).

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[116] Adjusted for inflation by HICP (Harmonised indices of consumer prices), base year is 2011.

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Looking across the subsectors, the turnover data also reveal large differences. Manufacturing turnover has been nearly halved over the period. Trade turnover has declined by 36% and services turnover has declined by 18%. On the other hand, call centres and repair have experienced increasing turnover of 9% and 10% respectively.

Table 3-32   Annual turnover – subsectors, 2008–2012 – million euros, adjusted for inflation by HICP (2011=100)

	2008	**2009**	**2010**	**2011**	**2012**
Manufacturing	2.120	1.446	1.285	1.297	1.183
Trade	3.617	3.416	3.009	2.546	2.307
Services	11.701	11.742	11.445	10.211	9.628
Call centres	248	268	322	279	271
Repair	87	77	92	109	96
Total	17.773	16.949	16.152	14.443	13.485

Source: Eurostat, Structural business statistics (sbs_na_1a_se_r2).

As for the number of employees per company, there are large differences in turnover per employee between the different subsectors. The number is highest in Manufacturing of consumer electronics (around EUR 300,000) and in Data processing, hosting and related activities; web portals (around EUR 400,000). The smallest turnover per employee can be found in Call centres (around EUR 25,000) and Repair of Computers, and communication equipment (around EUR 40,000). Looking at the average turnover per employee in Portugal (EUR 70,000) data indicate that the turnover per employee is below average only in the latter two subsectors.

In summary, the ICT and Telecommunications sector is experiencing a declining turnover and decreasing number of companies with respect to manufacturing, trade and services, but experiencing an increasing turnover and growing number of companies in call centres and repair. The decrease in turnover in manufacturing, trade and services has taken place more rapidly than the decrease in the number of companies. Furthermore, the increase in turnover has been slower than the increase in the number of companies in the repair-sector. In general, therefore, turnover per company has decreased, with the only exception being the call centres subsector.

3.8.2   Employment and working conditions

The number of employees in the ICT and Telecommunications sectors was 1.6% of the total workforce in 2008. From 2008 to 2011, there was an average growth of 3.7% to the total number of employees (Inova-Ria, 2013).[117]

The distribution of employed persons in the telecommunications and ICT sectors on education levels is shown in Table 3-33 below. In 2013, the subsector with the highest share of employed persons with low or medium level education is manufacturing. The

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[117] We have not been able to obtain employment data distributed on the industries or subsectors from Eurostat's Structural Business Statistics for Portugal.

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subsector with the highest share of employed persons with high levels of education is services. These data are not available for the trade subsector.

Table 3-33   Distribution of employed persons in ICT and Telecommunication by subsector, 2013, %

	Manufacturing	**Services**	**Call centres**	**Repair**	**All employed workers**
1.Low	45%	12%	14%	31%	57%
2.Medium	55%	37%	51%	48%	22%
3.High	0%	52%	35%	21%	21%
Total	100%	100%	100%	100%	100%

Source: Own development on the basis of data from Eurostat Labour Force Survey.

The distribution of employed persons by number of working hours per week in the ICT and Telecommunications sector, and its development over time is shown in Table 3-34 below. Manufacturing and services appear to have a higher share of employed persons working more than 40 hours per week, whereas call centres and repair experience a decline in the share of employees working more than 40 hours per week. These data are not available for the trade subsector.

Table 3-34   Share of employed persons working 40 hours or more per week, %

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**% change 2008-2013**
Manufacturing	61%	63%	68%	65%	69%	66%	9%
Services	64%	69%	69%	70%	70%	71%	12%
Call centres	53%	42%	45%	46%	44%	50%	-7%
Repair	82%	79%	80%	73%	87%	81%	-2%

Source: Own development on the basis of data from Eurostat Labour Force Survey.

Table 3-35 below shows the share of employed persons in the ICT and Telecommunications sector who are employed on permanent contracts, and how employment contracts have developed over time. The shares are more or less constant over time in all subsectors except for call centres, where temporary contracts have become much more widespread. These data are not available for the trade subsector.

Table 3-35   Share of employed persons on permanent contracts, %

	2008	**2009**	**2010**	**2011**	**2012**	**2013**
Manufacturing	91%	90%	92%	92%	93%	91%
Services	90%	91%	89%	90%	91%	90%
Call centres	87%	76%	76%	77%	78%	78%
Repair	94%	92%	97%	96%	90%	96%

Source: Own development on the basis of data from Eurostat Labour Force Survey.

The interview respondents are divided between employer organizations and employee organizations. While all agree that job security is not as strong as it has previously been, and that employees work longer hours, there are differences concerning the explanations for the development, and different emphasis is put on the developments. Employee organizations describe the developments as negative and being caused by

outsourcing and competition, whereas employer organisations link the developments with increasing salaries and new business models. An example of a reply from an employee organization is: "Job security has been affected negatively by these restructuring processes. The working time has increased. The salary has decreased for several reasons. However, it is important to emphasise that the dilapidation of the working conditions have little to do with the fluctuation of salaries, which can be a consequence of broader more difficult economic conditions. The negative development of working conditions is related to the social dumping and the outsourcing which is done in a frequent fashion. The career conditions are worse or even inexistent. The available training is insufficient." On the other hand, an example of an answer from an employer is: "*(Job security) has been affected, but this development is not a privilege of the telecommunications and ICT sectors. The new work order and working conditions have a consequence for job security, which is less common. (Working time) There are new forms of working conditions, e.g. teleworking and working on a project basis. After the restructuring of old state monopolies, the new entrants developed new management models that, coupled with globalisation and offshoring, create the need for new working times. (Salary) There has a bigger demand for professionals in the sectors than there are available. This movement drives an increase in salaries (Career conditions and training) In this particular sector, there is a great need for training because there are rapid changes in the products cycles, or new languages and new business models that displace old practices. Workers and companies need to provide the possibility for training, which is a bigger need in order to follow the products' cycles*."

When asked about their expectations for the development of the employment in the sector, there is agreement that manufacturing will continue to decline, because hardware manufacturing will move out of Europe. An example of a response is: "Yes, this development will continue in the future. The traditional sectors are related to the manufacture of hardware. Considering the new world order, cost of productions and components, these are manufactured in other countries outside Europe. In Portugal, the activities that are more specialized and focused on service will remain. The hardware production is left to other countries." However, the respondents did not have anything to say about their expectations regarding the development in other subsectors of telecommunications and ICT.

When asked about their expectations concerning the development in flexible vs. permanent workers, respondents agree that use of flexible workers on temporary contracts will increase. Respondents point to call centres as the subsector where this tendency will be most pronounced. Employee organizations emphasise worsening working conditions in call centres. Employer organizations point to the advantages for workers associated with more flexibility.

When asked about their expectations concerning the developments in the education composition of the telecommunications and ICT workforce, respondents agree that the technological development will require increasingly specialized workers, and that jobs requiring less skills will to an increasing extent be outsourced. Furthermore, respondents agree that the technological and market developments require constant skill upgrading and that skills are becoming obsolete at a faster rate compared to previously.

In summary, the data and the interviews point in the direction of increased use of temporary contracts and longer working hours. However, there are differences across the subsectors. For manufacturing and services, the increase in working hours is supported by both data and interviews. On the other hand, for call centres and repair, the data and the interviews appear to be at odds. A hypothetical explanation for call

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centres is that the temporary contracts which are becoming increasingly used in the subsector are associated with shorter working hours.

3.8.3   Industrial relations

Despite the importance given to the ICT sector and to innovation by governmental policies, the economic and financial fragilities of the country have hindered the expansion of the sector; as a consequence, there are no Portuguese players with significant dimension in the European market.

It is considered that the austerity measures and changes in labour legislation implemented in 2011 marked a shift of industrial relations in Portugal which favoured "the employers' position at all levels of the industrial relations system" (EIRO, 2011:3). Unions came under strong pressure in their discussion about wage regulation, job security and unemployment.

Collective bargaining and social dialogue
The latest publically available numbers regarding the overall trade union density is estimated at approximately 20%, while the collective bargaining coverage is estimated at over 90% of the Portuguese workforce[118]. There are no data, however, on the distribution of trade union density and collective bargaining coverage per sector. Generally the "lack of precise data makes it difficult to give figures of trade union membership in Portugal and there is a large gap between the totals provided by the unions and the union density estimates of the government"[119].

The trade union density in Portugal is relatively low. Some interview respondents state that the fragmentation and heterogeneity of the sector may have made it more difficult for unions to organise the workers: "*There has been a difficulty in organising the workers according to their different levels of specialization. And, considering their areas of specialization, which is inside the company, there have been difficulties in organising. It has also to do with the temporary work and some workers hired by call centres, i.e. the fragmentation of the workforce requires a reorganisation and adjustments among the workers. It is a fact that companies are trying to transform the working conditions and it is necessary to have a different organisation in order to address precarious working conditions*."

The structures of social dialogue are considered well established in Portugal, in that there are regular negotiations between social partners (Ramalho, 2013)[120]. Yet, social dialogue has been hindered by recent changes in the employment regulations and by the economic crisis. Hence, the content of social dialogue in Portugal has shifted from provisions that were highly protective in regard to remuneration and other work-related costs to more flexible provisions in areas such as job classification, working-time or the workplace.

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[118] http://www.worker-participation.eu/National-Industrial-Relations/Countries/Portugal
[119] http://www.worker-participation.eu/National-Industrial-Relations/Countries/Portugal
[120] Ramalho, Maria do Rosário Palma (2013) Portuguese labour law and industrial relations during the crisis. ILO.

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In this context, it is possible to observe that the content of social dialogue reflects the trade unions attempt to reclaim their place in a tripartite process, where trade unions are considered as legitimate partners for dialogue and cooperation. An analysis of the websites of Portuguese unions, which represent the telecommunications and ICT sectors, indicates that workers are particularly concerned with the following topics:

- the impact of the merging of large enterprises, which might outsource jobs and increase job insecurity[121];

- the deterioration of the working conditions, especially for temporary workers employed in the call centres;

- development of collective agreements that ensure a minimum standard to working conditions;

- increase in the current investment on training and educational programmes, in order to promote re-skilling of workers.

On the other hand, employer organisations and business associations have emphasised topics that frame the content of social dialogue. This is done by giving bigger flexibility and autonomy for companies[122]. Consequently, collective bargaining and social dialogue has only been attractive to employers to the extent it focuses on measures that increase efficiency and competitiveness.

Hence, the current content of collective bargaining and social dialogue in Portugal shows that trade unions and employer organisations are each prioritizing different areas of negotiation.

3.8.4 Summary

In summary of the entire case study, there appears to be consistency between the evidence of strongly declining turnover and number of companies in the manufacturing subsector with the longer working hours and the interviews which state that low skilled jobs are being outsourced in particular in manufacturing of hardware. Almost the same can be said for services, but for that subsector, education levels are high, and that the sector is very heterogeneous –spanning from installation workers over programmers to implementation and system development consultants. So for the services subsector, the impact of outsourcing may be less strong than is the case for manufacturing. For call centres, the story is even more complex. That subsector has grown both in turn over and number of companies. This might be expected to have had a positive impact on working conditions, but the data and the interviews point in different directions. On the one hand, declining hours of work might be an indication of improved working conditions, everything else equal. On the other hand, interview responses and the increased use of temporary contracts point in the direction of worsening working conditions.

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[121] http://noticias.sapo.tl/portugues/lusa/artigo/18463415.html and http://www.stpt.pt/anexos/ncs3-11-14.pdf
[122] http://www.tice.pt/apresentacao/apresentacao.aspx

The findings in the country case study lend support to the hypothesis of increasingly blurred boundaries between the ICT and Telecommunications sector. Neither the literature nor the interviewees can provide a clear indication of a recommend definition.

The ICT and Telecommunications sector is experiencing a declining turnover and decreasing number of companies with respect to manufacturing, trade and services, but experiencing an increasing turnover and growing number of companies in call centres and repair.

The country case study indicates an increased use of temporary contracts and longer working hours. However, there are differences across the subsectors. For manufacturing and services, the increase in working hours is supported by both data and interviews. On the other hand, for call centres and repair, the data and the interviews appear to be at odds.

Concerning the social dialogue, the composition of the sector appears to be changing. Manufacturing and telecommunications are becoming less important, while services are barely holding their ground – in terms of turnover. In terms of number of companies, manufacturing and services are becoming less important, but telecommunications appears to be increasing in importance.

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4 Multinational company case studies

The annual reports (2013) from the multinational companies selected for the study show the following economic indicators. Each case study contains a brief introduction to the activities of the enterprise analysed, introduces their view on the boundaries of the telecommunications and ICT sectors, and addresses thereafter employment and working conditions and industrial relations:

Table 4-1 Economic indicators of the multinational companies

Multinational company	Number of full-time employees	Annual turnover	Value added
Telefónica SA	126,730[1]	EUR 57,061 million	EUR 40,020 million
IBM	431,212[2]	USD 99,751 millions	NA
Vodafone	91,000[3]	GBP 44.4 billion	NA
Acxiom	6,300	USD 1,099,359	NA
Teleperformance	149,000	EUR 2,433 million	NA

Sources: annual reports 2013

4.1 Telefónica

Telefónica S.A. is part of an integrated and diversified telecommunications group operating mainly in Europe and Latin America, but also with operations in Asia, North and South America. The Telefónica group activities are centred *"around services of fixed and mobile telephony, broadband, Internet, data traffic, pay TV and other digital services"* (annual report, 2013:9). The company was established in 1924, has headquarters in Spain and is one of the largest mobile network providers in the world. The following data, retrieved from Telefónica's 2013 annual report, present its current landscape:

- The Telefónica group revenue was EUR 57,061 million in 2013, which represented a growth of 0.7% in relation to the previous year.

- The group's added value (operating margin: income-supplier expenses) went down from EUR 44,282 million in 2012 to EUR 40,020 million in 2013.

- Telefónica employs 126,730 workers distributed over Spain (27.7%), other European countries (16.4%), Brazil (16.7%) and other Latin American countries (39.2%). Considering the overall number of employees, 61.68% are men and 38.32% women. Those within its core workforce, i.e. working under a contract of indefinite duration, constitute 89.24% of Telefónica's workforce – a reduction of 3.9% compared to the previous year.

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[1] Number of employees with a contract at the end of the fiscal year
[2] Number of employees in IBM/wholly owned subsidiaries
[3] Represents the average number of employees in our controlled and jointly controlled markets during the year.

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▪ Telefónica Europe has a European Works Council (EWC), which meets every six months to promote dialogue and exchange opinions among stakeholders. Currently, Telefónica's EWC has ten workers' representatives: one in Ireland, five in the UK and four in Germany. In general, however, the group operates according to the different laws and regulations in each of the jurisdictions in which it operates, which produces a variation in their engagement in issues of collective bargaining.

▪ Telefónica has invested in training through the Universitas Telefónica and other diverse training initiatives. The group invested 2,859,751 hours in employee training during the fiscal year of 2013, an increase of 60% compared to the previous year.

Boundaries of the telecommunications and ICT sectors

According to Telefónica, it has been increasingly hard to define the main stakeholders and economic activities within the telecommunications and ICT sectors, especially due to the high levels of innovation. To operationalize these changes, Telefónica defines the sector according to its main services and products. This approach builds on the characterisation of an *ICT hyper sector*, which includes four component blocks in its global framework:

▪ Telecom: For instance, fixed voice, fixed data, mobile voice and mobile data.

▪ ICT: For instance, hardware (server systems, storage, peripherals and telecom equipment), software (system infrastructure, application D&D and applications) and ICT services (training & education, planning, implementation, support services and operations management).

▪ Consumer electronics: For instance, mobile handset, personal computers, tablets, flat panel TV, audio & systems and others – eReaders, games consoles and digital imaging.

▪ Digital content & entertainment: for instance, business to business contents, TV and filmed entertainment, newspapers, magazines, video games, radio and music, out-of-home advertising and internet advertising.

It is possible to observe that the *ICT hyper sector*, as defined by Telefónica, goes beyond the traditional telecommunications services and incorporates digital content and entertainment.

In contrast, the activities that are not included in the sectors are non-digital contents and entertainment and other related sectors, e.g. travel tickets sold via e-commerce.

The definition used by Telefónica reproduces a trend identified by Henten et al. (2003) in which there is a convergence between a broad range of industries that go beyond the framework of traditional telecommunications and ICT sectors to reach IT, media, broadcasting and other media dealing with information and entertainment. The participants indicated that any good definition of the telecommunications and ICT sectors should be able to incorporate the development of new services, e.g. cloud computing, and other industries that also provide ICT goods and services. In this context, the OECD definition seemed to be the most adequate and flexible to capture both traditional and emerging services.

The increase in the overlapping areas of the telecommunications and ICT sectors is also observed by Telefónica, and this trend, which converges services and stakeholders, is expected to continue in the future. According to Telefónica, companies

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that are not traditionally within the telecommunications and ICT sectors use ICT tools to innovate in products and services and thus gain market share and new revenue streams, e.g. Amazon providing video streaming. This movement increases the homogeneity *across* sectors, where formerly distinct enterprises are now competing with the same services. The economic activities *within* sectors, however, are perceived as more heterogeneous, as a consequence of the high levels of diversification, specialisation, and innovation.

This development has broadened the understanding of belonging to one common sector, since the same service is delivered through different infrastructures. Yet, according to the participant, the existence of competing services is an indication that companies still belong to one common sector, e.g. Google's and Apple's competing mapping applications. This statement is corroborated by Henten et al.'s (2003:26) understanding that *"convergence facilitates more competition"* in developed countries, while it *"facilitates complementarity"* in developing markets.

Telefónica considers that the subsectors with higher economic growth are mobile data (estimated to grow more than 8%), software services, especially applications, smartphones and tablets, and digital content.

It is possible to emphasise that Telefónica expects the digital content subsector to present economic growth across all its activities, especially Internet advertisement, TV and film.

4.1.1   Employment and working conditions

Telefónica indicated that the restructuring of the telecommunications and ICT sectors has affected every element of the working conditions. Working conditions have been affected through, e.g. increase in the working hours and lower job security, while others remain controlled by the market, e.g. salaries and investment in training and its content.

It is also possible to observe that telecommunication and ICT companies tend to reduce their core workforce. However, the employment of flexible workforces varies significantly according to the laws and regulations of each of the countries within Telefónica's area of operation. The use of freelance and/or self-employed workers is commonly done on a project basis in order to meet specialisation needs. The participants consider it easier to recruit persons that are already qualified instead of investing in punctual specialisations. The freelance and/or self-employed workers, however, do not have the same working conditions as the core workforce, and are perceived by Telefónica as service providers. According to the participants, this arrangement enables the use of specialisations that are not found in-house, while allowing the establishment of new relationships once the service is done. On the other hand, Telefónica indicated that disadvantages to this arrangement are the high costs of services and the fact that that particular knowledge is not owned by the company.

Telefónica provides training for its employees in order to maintain highly qualified professionals in a rapidly evolving sector. According to the participants, increasing qualifications – with an emphasis on e-skills – is necessary for a company to move in the same direction as market and consumers. Telefónica's investment in human capital can also be analysed according to two different perspectives: as a means to improve the customer experience or as a means to implement internationalised practices.

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The first strategy focuses on training of professionals closely involved in customer relations. For instance, Telefónica has *"invested considerable effort in improving employees' training, job mobility, and sense of belonging"* (Ôsterle et al., 2010:54). The high levels of customer satisfaction are here seen as a consequence of working conditions that have *"turned employees into fans"* (Ôsterle et al., 2010:54).

The second strategy focuses on executive education and on a centralized corporate university in order to *"face the challenges of satisfying multiple sets of stakeholder groups in different countries"* (Davila & Elvira, 2009:70). Here, Telefónica invests in training programmes to upgrade the managerial skills and thus develop practices in accordance with its global nature.

Finally, the trend where employment patterns shift from traditional telecommunications to more knowledge-intensive sectors/jobs has also been indicated. Yet, according to Telefónica, it remains necessary to employ workers with different backgrounds and levels of expertise to maintain its core activities.

4.1.2 Industrial relations

The difficulties of organising in the telecommunication and ICT sectors are perceived by Telefónica to be a consequence of the sectors' expansion, which has hindered the organisation of employees around trade unions. In this context, it is expected that employee organisation will continue to fall in the future.

Yet, Telefónica still tries to coordinate their activities with trade unions since some working conditions are negotiated through collective bargaining. The dialogue between stakeholders emerges as an important point in instances of employee training, evaluation and subsequent protection, e.g. *"in accordance with the conditions of existing collective bargaining agreements, if Telefónica's instructor rates the employee's performance positively, the employee's participation in the training course will be included in the employee's performance record"* (Davila & Elvira, 2009:69).

The participants also indicated that it is necessary to take the sectors' development into account when reorganising skills and structures of collective bargaining.

Collective bargaining and social dialogue
Telefónica Europe has a European Works Council (EWC). This council informs and consults employees and promotes discussions and sharing of opinions. It has a chairman and a secretary and 10 workers' representatives: one in Ireland, five in the UK, and four in Germany. They meet every six months to discuss current issues within Telefónica Europe, ranging in topics from changes in organisation or structure to the introduction of new working methods and technologies, to workforce reductions or social and human resource policies. Collective bargaining agreements are a main point of interest in these discussions. Recent developments have occurred in Spain regarding collective bargaining rights. Telefónica Spain (TdE) made important advances in collective bargaining in 2013. The current Collective Agreement at that

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time (2011-2013) was modified, and the company and employee representatives signed an accord that extended this agreement to December 31st, 2014. The accord attempts to make the current agreement more efficient and productive.[123]

Telefónica considers collective bargaining a significant tool in the negotiation of working conditions. It is thus understood that collective bargaining brings added value to both employers and employees, whilst improving the relationships within the companies.

Negotiations with trade unions often focus on downsizing and restructuring, which are processes that affect a lot of jobs and, consequently, workers. In these cases, Telefónica attempts to develop negotiated transitions together with the trade unions.

Outsourcing
When outsourcing is carried out, it is possible to observe that the workers employed in Telefónica's subsidiaries are normally independent, which means that they have their own forms of collective organisation outside trade unions. The numbers of stakeholders in outsourced companies also depend on the national legislation, which determines the extent to which trade unions are available to different categories of workers, e.g. consultants and self-employed workers.

The participants indicated that outsourcing is carried on a project basis, since a specific project might require an expertise that is not found within Telefónica. At the same time, support areas, e.g. HR and accounting, and technical areas, e.g. call centres and customer support, are increasingly outsourced. This is a trend identified within Telefónica's own strategic plan, which seeks to circumvent labour limitations, trade union reviews, inflexibility and reduce costs. Once the outsourcing is carried out, Telefónica focuses on its management to ensure standardised practices among its subsidiaries.

4.2   Vodafone Group plc

Vodafone Group plc is a British multinational telecommunications company headquartered in London and with its registered office in Newbury. It is the world's 3rd-largest mobile telecommunications company measured by both subscribers, having 434 million as of 31 March 2014, and 2013 revenues (behind China Mobile).

Vodafone owns and operates networks in 21 countries and has partner networks in over 40 additional countries. Its Vodafone Global Enterprise division provides telecommunications and ICT services to corporate clients in over 65 countries.

Vodafone defines itself as a *"global communications business"* that provides telecommunications services. This definition is in accordance with Ibbot's (2007)

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[123] Labour practices: Freedom of association and social dialogue: Annual Report 2013 Telefónica.
http://annualreport2013.telefonica.com/sites/default/files/documentos/4.3.6%20labour%20practices_freedom%20of%20associatio
n%20and%20social%20dialogue.pdf

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distinction between global and international companies. Vodafone is considered a global company since *"its sourcing and supply-chain activities were transformed to be entirely global for the major part of its investments, while services remain local"* (Ibbot, 2007:1). The following data, retrieved from Vodafone's 2013 annual report, present its current landscape:

▪ The group revenue in 2013 was GBP 44.4 billion, which represented a decrease of 4.2%. This negative development was perceived as a consequence of the *"significant economic and regulatory pressures in Europe"*. Yet, most of its revenue continues to come from mature European markets.

▪ Vodafone employed 91,000 persons worldwide in 2013. Approximately 29,120 of those employees are located in Europe, i.e. 5% in Spain, 6% in Italy, 9% in the UK and 12% in Germany.

▪ The number of part-time employees in 2012/2013 was 8,802. Vodafone had an average turnover rate of 16% in those years.

▪ Vodafone invested over GBP 34 million in training programmes during 2013.

4.2.1   Boundaries of the telecommunications and ICT sectors

According to Vodafone, any definition that attempts to describe the current landscape of the telecommunications and ICT sectors must account for the increasing interconnectivity between technologies. The telecommunications portion of the sector is especially pressured to integrate ICT technologies in its core activities, e.g. through the integration of both work and home networks. In this context, Vodafone suggests that an expansion of the OECD definition, by adding a phrase about *"processes that enable integration of ICT technologies by electronic means"*, would better describe the current landscape. In order to define the telecommunications and ICT sectors, it is thus important to emphasise the interconnectivity that they enable.

The shifting boundaries of the sectors have also influenced Vodafone's business model, which has evolved from mobile voice to data packages. Sparrow et al. (2010) explain this evolution by concluding that Vodafone's business model is susceptible to four forces: *"changes in technology; new entrants in the competition (such as providers of fixed-line services, or providers of other services such as VoIP); changes in regulations; and an increasingly aware, discerning, and demanding customer with lots of options"* (Sparrow et al., 2010:83).

The increasing overlap between areas of the telecommunications and ICT sectors is understood by Vodafone as a result of the search for connectivity, in which ICT tools are expected to be accessible to multiple consumers and networks in a variety of settings. The increasing mobilization of ICT software across services and devices also contributes to the heterogeneity within sectors, e.g. e-commerce. Consequently, there has been a blurring of the boundaries between the telecommunications and ICT sectors, which has changed consumers' expectations: Today the same effectiveness and quality of services is expected across different networks and platforms.

On the other hand, the increasing heterogeneity has fostered the creation of topic or global solutions, rather than national solutions, i.e. integrations are delivered by niche companies at the same time that the overall mechanism is standardised. Vodafone has been developing international solutions that fit across the group, thus creating homogeneity within its own operations.

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Finally, according to the participant, companies have no difficulties in identifying to which of the sectors they belong. The difficulties arise on the economic availability of making a product to large scale, namely, on creating a place within such dynamic and internationalised sector.

Vodafone has identified an increase in the subsectors that manage the higher-value consumers and the integrated business providers. On the consumer side, the economic growth has been a consequence of the higher utilisation of data, e.g. tablets and smartphones. On the enterprise side, there has been growth in the areas that focus on the integration between networks, e.g. old fixed lines with mobile telecommunications, in order to increase the flexibility and mobility among workers, especially in the public sector.

4.2.2   Employment and working conditions

The working conditions are described under a positive light by Vodafone. Even though some aspects of the working conditions have changed, e.g. job security and working time, the conditions are seen as vibrant and challenging.

The fluctuation in employment is seen as a consequence of the flexibility required by the sector. Hence, the core workforce employed by Vodafone tends to decrease, while the number of temporary workers increases according to different demands, e.g. two or three-year contracts (rolling-out networks) or seasonal contracts (retail stores).

The recruitment of telecommunications and ICT professionals is, to a great extent, done in the global market. This strategy is used by Vodafone in order to adapt to international developments that have become standardised practices in the sectors.

Besides recruiting in the global arena, Vodafone also employs two types of contingent workers, namely, those who are supplied by another major company in the sectors – as part of a cooperation agreement, e.g. Vodafone-Ericsson – and those who are provided by temporary workers' agencies. The latter usually have the same working conditions as those belonging to the core workforce. The participant has indicated that the main advantage of this relationship is the capacity to increase or decrease activities according to the current need of a new product or service. On the other hand, these workers are bound to contractually defined activities, which limit their inputs to one single project.

Vodafone employees are expected to be much more accountable for the development of their own skills in these rapidly evolving sectors. In this context, it is possible to observe an overall pattern within multinationals, which tend to employ workers with skills and experience, rather than invest in training and re-skilling.

Yet, the sectors still require a wide range of expertise among its workers. According to Vodafone, workers with lower skills related to core structures are, paradoxically, more difficult to replace.

4.2.3   Industrial relations

Vodafone attributes great importance to flexible industrial relations in order to operate competitively in the telecommunications and ICT sector.

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Collective bargaining and social dialogue

Vodafone prefers to speak with its employees directly, whether they are represented by a trade union or not. The company does recognize the rights of its employees to freely join trade unions. In countries where legislation automatically declares that employees must be represented by trade unions, Vodafone upholds these rights. In Europe, Vodafone consults directly with its employees through round tables and employee representatives. If two or more countries in Europe are involved or impacted by a change in business practices, then employees are spoken to through Vodafone European Employee Consultative Council (EECC). The EECC was formed in 2003, it is organised to meet the requirements of a European Works Council (EWC) and has employees from 14 countries within the EU.[124]

Vodafone has described its membership of employer organisations as a means to discuss the standardisation within the sector and the laws on competition. These organisations are perceived as commercial bodies, and not as arenas of social dialogue. According to the participant, social dialogue tends to be kept locally, since industrial relations are considered to be country-specific.

According to Vodafone, the chances of collective bargaining delivering improvements in the working conditions are relatively small because the sectors are so different and disperse. In a market where applications to fill in vacancies are highly globalised, collective bargaining is seen as almost irrelevant by Vodafone. Consequently, negotiations on working conditions are commonly done on an individual basis. It is possible to have global principles of collective bargaining, but the implementation of these principles shall be country-specific.

The difficulties of organising are seen by Vodafone as a result of the culture of each country, and not as a result of the development of the sectors. For instance, according to the participant, there is a work council structure in the United Kingdom that does not act in the sense of collective bargaining.

Outsourcing

According to Vodafone, there has been an increase in outsourcing since the technology used in the sectors is more reliable and efficient. A lot of the current development and maintenance can be done remotely and, as a consequence, the number of locally based employees has fallen dramatically.

The decision to outsource has an economic rationality in which the existence of collective bargaining has little impact. Offshore subsidiaries are perceived by Vodafone as providing efficient low-end development at lower costs. Moreover, the traditional outsourcing countries, e.g. India and China, have higher levels of investment on education, training and on mobile networks, which cannot be found in Europe after the restructuring and downsizing of the telecommunications sector.

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[124] http://www.vodafone.com/content/sustainability/operating_responsibly/our_people.html#op2

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4.3 IBM Global Services

IBM Global Services, a division of IBM, is the world's largest business and technology services provider. It employs over 190,000 people across more than 160 countries. IBM Global Services started in the spring of 1991, with the aim towards helping companies manage their IT operations and resources.

Global Services has two major divisions: Global Business Services (GBS) and Global Technology Services (GTS).

IBM operates in high-value segments of enterprise computing. IBM produces software and provides technological consulting services. The company creates new markets for their technologies and services by continually transforming its business practices and delivering higher value to its clients.[125] The following data, retrieved from IBM's 2013 annual report, present its current landscape:

- IBM had revenue of USD 99,751 million in 2013.

- IBM and its wholly owned subsidiaries employed 431,212 persons in 2013. Its complementary workforce, i.e. *"full-time employees hired under temporary, part-time and limited-term employment arrangements"*, comprises another 23,555 persons across the 175 countries of activity.

- 50% of IBM's employees have less than five years of service, and 40% of IBM employees work remotely, either from home or at a client site.[126]

- IBM states that the expertise of the workforce is as critical to its success as the effectiveness of its technology and it invests more than USD 750 million annually to help make sure that its employees have leading-edge skills and ongoing development opportunities.[127]

4.3.1 Boundaries of the telecommunications and ICT sectors

According to IBM, the ITU definition is suitable to discuss the angle of standardisation of the telecommunications and ICT sectors. However, the OECD definition presents a better framework to address the sectors' economic activities.

The telecommunications and ICT sectors are not perceived to be more fragmented or heterogeneous than other economic sectors: For instance, the automotive sector also relies on an extensive variety of suppliers and pieces of technology.

Rather than fragmented, the telecommunications and ICT sectors are considered by IBM as globally integrated. There are more levels of integration that enable the cooperation between big and small players within the sectors. The driving forces

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[125] IBM Annual Report 2012. http://www.ibm.com/annualreport/2012/bin/assets/2012_ibm_annual.pdf
[126] http://www.ibm.com/ibm/responsibility/employees.shtml
[127] http://www-03.ibm.com/employment/us/li_career_dev.shtml

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behind this development are the integration of technologies and processes across sectoral and geographical boundaries.

4.3.2 Employment and working conditions

According to IBM, the enterprise first launched a work-life balance initiative more than two decades ago, with the establishment of corporate child care. Today, IBM focuses on flexible working conditions that enable a good balance between work and personal life.[128] These initiatives are said to improve the relationship between employer and employee and enhance productivity. The state of the working conditions at IBM seems to be reflected in the great number of positive ratings that the company has received from reviews made by current and/or previous employees.[129] On the other hand, according to IBM's own *Global Pulse Survey*, only 67% of its employees considered themselves satisfied with their jobs.[130]

Making training programmes available is seen as a key aspect within IBM's corporate social responsibility initiatives. In the period between 2004 and 2008, IBM increased the total learning hours of its employees from 15.3 million to 23.3 million. Yet, the availability of training programmes has reportedly been used by IBM to make payment cuts in 2014.[131] According to this perspective, IBM has launched a 'co-financed' training programme that has to be compulsorily taken by a group of low-performing employees. In this scenario, salaries would only be restored after the training is completed.

4.3.3 Industrial relations

IBM is a member of European industry organisations such as Digital Europe and BUSINESSEUROPE. As a member of BUSINESSEUROPE, IBM supports a Europe where stronger growth and structural labour market reforms lead to economic growth and increased jobs. Reform comes in the form of improving the flexibility of labour markets and ensuring labour costs remain in line with productivity.[132] On the other hand, the levels of employee organisation at IBM depend on the national legislation of the countries in which it operates. IBM does not discriminate employees based on whether they decided to join a labour organization or not.

Collective bargaining and social dialogue
A decrease in the level of employee organisation has not been perceived by IBM. Yet, the interviewee has indicated that workers might be reluctant to join trade unions, since the added value created by trade unions is not clear to young professionals. In addition, the effectiveness of collective bargaining is also questioned by the interviewee.

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[128] http://www.ibm.com/ibm/responsibility/employees_work-life_balance.shtml
[129] http://www.indeed.com/cmp/IBM/reviews?fcountry=AF To date, there were 4.547 reviews rating IBM. The result of these reviews was an average for 4 (out of 5) for IBM's overall working conditions.
[130] http://www.ibm.com/ibm/responsibility/ibm_crr_downloads/pdf/kpi_charts/2008_IBMCRR_EmployeesKPI.pdf
[131] http://www.computerworld.com/article/2683239/ibm-cuts-pay-by-10-for-workers-picked-for-training.html
[132] Business Europe. Future of Social Europe: Challenges and the way ahead. November 2014.
http://www.businesseurope.eu/Content/default.asp?pageid=568&docid=33574

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Outsourcing

According to IBM, several reasons drive the decision to outsource services and activities. Firstly, tasks that can be performed effectively in another country with cheaper labour costs, and secondly, outsourcing of activities that do not constitute the core competence of the company. However, there is no clear indication of the extent to which IBM itself resorts to outsourcing.

On the other hand, it is possible to observe that IBM has adapted its business model to the overall outsourcing trend *within* and *across* the telecommunications and ICT sectors, since *"all industries today face the common challenge of managing information flows"* (Miozzo & Grimshaw, 2011:912). In other words, rather than resorting to outsourcing, IBM provides outsourcing, namely, 40% of IBM's revenue comes from providing IT infrastructure and business solutions to clients. The practices of "outsourcing plus staff transfer" consist of *"negotiating outsourcing contracts that include the transfer of IT workers from the client to the IT firm. In this way, skills with client-specific knowledge are acquired with no costs by the IT services supplier as part of each major outsourcing contract"* (Miozzo & Grimshaw, 2011:923). Consequently, providing outsourcing is also part of IBM's strategy for skill acquisition.

4.4   Acxiom Corporation

Acxiom Corp. was founded in 1969, has headquarters in Arkansas U.S.A. and has offices in Europe, Asia and South America. According to its annual report (2013), Acxiom is described as *'an enterprise data, analytics and software-as-a-service company'* with business segments consisting of Marketing and Data Services, IT Infrastructure Management, and Other Services. The company has data and insight into approximately 700 million consumers around the world.[133] The following data retrieved from Acxiom's annual report, present its current landscape:

- Acxiom revenue was USD 1,099,359 in 2013.

- Acxiom employed approximately 6,300 workers worldwide in 2013. In this regard, it is worth mentioning that *"no US associates (employees) are represented by a labour union or are the subject of a collective bargaining agreement",* while *"22 associates are elected members of work councils or trade unions representing Acxiom associates in the European Union"*.

4.4.1   Boundaries of the telecommunications and ICT sectors

Acxiom concentrates its activities on direct marketing and customer relationship management. Considering Acxiom's focus on managing data flows, it is possible to observe that the company is embedded in the ICT subsectors, at the same time as it relies on call centres for its activities.

The growth strategy described below indicates that Acxiom addresses a growing overlap between sectors in its growth strategy. Especially with the strong focus on big

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[133] Annual Report, 2013: 8

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data, it is indicated that Acxiom aims to use tools from the ICT sector to provide services to its customers in other sectors.

Acxiom has a growth strategy based on the following growth opportunities within the telecommunications and ICT subsectors:[134]

- Big data
- Data management platforms
- Advertisement
- Consumer privacy and security.

Hence, the areas of growth in the sectors exemplify the shift from traditional telecommunications to knowledge intensive subsectors that rely on ICT-tools.

4.4.2 Employment and working conditions

Acxiom provides a number of benefits, contributing to creating satisfactory working conditions for its employees. These cover a number of areas, including health insurance, education reimbursement assistance, life and disability insurance, paid holidays, retirement savings plan, flexible hours for most job roles, and more[135].

Data indicate that current and/or previous employees are generally satisfied with working at Acxiom, describing it as a *"great"* and *"fun"* place to work, where you can achieve a good *"work life balance"*.[136] Thus, Acxiom might be considered successful in providing good working conditions for its employees: As stated in the 2013 annual report, *"Acxiom has never experienced a work stoppage, and we believe that our employee relations are good"*.[137]

Salaries at Acxiom seem to vary considerably within and across professions: While a network engineer can expect between USD 40,941 and USD 91,212 yearly, a senior project manager in IT can expect between USD 56,831 and USD 103,090 annually.[138] In 2001, nearly 2000 workers at Acxiom agreed to take voluntary pay cuts on top of a mandatory 5% pay cut, in order for the company to save millions of dollars. The average voluntary pay cut was 5.5%, but some employees went all the way up to 15%.[139] Employees were quoted as saying that they felt it was a good investment not only in the company, but also for their families and future employment. In exchange, the workers received two-for-one stock options. Foreign workers were not eligible for the mandatory cuts, but many voluntarily took a cut. Approximately 1/3 of the employees at Acxiom took these voluntary cuts, showing trust in the company's business practices and future endeavours.

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[134] Annual Report, 2013:7
[135] http://www.acxiom.com/about-acxiom/careers/company-benefits/
[136] http://www.indeed.com/cmp/Acxiom/reviews
[137] http://www.acxiom.com/wp-content/uploads/2013/09/2013-Annual-Report.pdf page 12
[138] http://www.payscale.com/research/US/Employer=Acxiom_Corporation/Salary/by_Job
[139] http://www.computerworld.com/article/2591993/it-personnel/acxiom-workers-line-up-for-voluntary-pay-cuts.html

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On the other hand, a current employee working as a client delivery analyst in Amsterdam stated in 2009 that "Acxiom's reaction to stagnation in revenue is getting rid of employees or making them unhappy with pay-cuts."[140] Depending on the geographical location of the company, mixed reviews regarding pay-cuts can be seen.

Despite having working conditions that are considered adequate, Acxiom has experienced difficulties in recruiting and retaining qualified personal. These difficulties are attributed to the high competitiveness of the market, due to the limited number of highly trained professionals[141].

It is anticipated by Acxiom that there will be an increased competition for qualified personnel, which could hinder its financial position.

4.4.3   Industrial relations

Acxiom maintains a set of industrial relations that varies according to jurisdiction in which it operates, as it can be seen from its take on collective bargaining.

Collective bargaining and social dialogue
There are no labour union representations or collective bargaining agreements that benefit Acxiom employees in the US. On the other hand, Acxiom lists 22 employees who are engaged in work councils in its European offices.[142]

Outsourcing
The issue of outsourcing is not addressed in Acxiom's annual report. The perspective used in the report is the extent to which Acxiom itself provides outsourcing to other companies.

4.5   Teleperformance

Teleperformance was founded in 1978 and has headquarters in Paris, France. According to its annual report (2013), the Teleperformance Group provides *"outsourced customer experience management"* to businesses in the form of customer service, technical support, social media and call centres. The company offers a multichannel-based experience, either via telephone, email or face-to-face, in any business sector and in multiple languages. Teleperformance is highly global and uses its networks to serve customers from either local centres, neighbouring or distant locations. The following data, retrieved from Tele performance's Annual Report, presents its current landscape:

▪ Tele performance's revenue was EUR 2,433 million in 2013, which represented an organic growth of 6.9% compared to the previous year. The breakdown of

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[140] http://www.glassdoor.com/Reviews/Acxiom-Netherlands-Reviews-EI_IE1086.0,6_IL.7,18_IN178.htm?sort.sortType=RD&sort.ascending=false
[141] Annual Report, 2013:7
[142] Annual Report, 2013:7

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Teleperformance's revenue according to their clients' business sector shows a relative decrease of the contribution of historical sectors, e.g. telecommunications, Internet and pay TV, and a growth of other sectors, e.g. health insurance and distribution.

▪ Teleperformance employs approximately 149,000 workers distributed over 46 countries. The US, Philippines, Mexico and Brazil account for 50% of the Group's workforce. Among the first ten countries of establishment, there are only three European countries, i.e. United Kingdom, Italy and France, which account for 11.65% of Teleperformance's workforce.

▪ Only one third of Teleperformance's subsidiaries have their own collective bargaining agreement given that *"practices and legislation [are] specific to each country"*. In those countries where there is no collective bargaining agreement, the national employment law prevails.

▪ Teleperfomance states the importance of career development for both the employees and the company. The upgrading of skills and knowledge is vital in the ever changing environment that Teleperfomance operates in. Teleperformance offers several internal training initiatives schemes, but it also recognises the importance of seeking out external learning opportunities. Employees are therefore offered opportunities to develop within their role through recognised qualifications.

4.5.1 Boundaries of the telecommunications and ICT sectors

Teleperformance defines its area of operation as being within the *"customer interaction market [which] encompasses the fields of customer relations, technical support and customer acquisition"* (Annual Report, 2013:17).

Teleperformance tends to represent activities within the subsector of call centres, which entails the use of a broader definition of the telecommunications and ICT sectors.

Teleperformance relies on "multilingual hubs" in its growth strategy, which enables coverage of all European markets from a small number of centres. Moreover, the multinational strategies focus on strategic markets, rather than strategic subsectors or activities within the telecommunications and ICT. In this sense, it is not possible to determine if Teleperformance identifies particular economic growth in some of the telecommunications and ICT sectors.

4.5.2 Employment and working conditions

Teleperformance states on its website that it is a *"People Company"* supporting the Global Compact initiative issued by the United Nations.[143] According to that statement Teleperformance respects the rights of all its employees across the globe. In 2013, an employee satisfaction survey was filled out by 77,041 employees in 42 countries, aiming at improving working conditions and promoting personal and profession

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[143] http://www.teleperformance.com/en-us/people-company/social-responsibility/the-global-compact

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development.[144] Furthermore, it supports and recognizes the right of all workers to collective bargaining, as well as the elimination of discrimination with respect to employment and occupation. Another focus area of the Global Compact initiative, which Teleperformance emphasises, is the work against corruption, extortion and bribery.

Teleperformance has won several company awards, also in the area of working conditions, such as the Aon Hewitt Best Employer Award in 2014, and the Great Place to Work award for Brazil in 2014 by the Great Place to Work Institute.[145] Thus, the company can be assumed to provide workers with satisfactory working conditions.

Data gathered from a company review website indicate that hourly salary varies relatively little across professions: A call centre manager receives around USD 10.75 per hour, a customer service representative USD 10.00 per hour, a technical support employee USD 10.50 per hour, and a sales agent USD 9.75 per hour.[146] This could indicate that there is relative wage equality in Teleperformance, but also that salaries generally are not very high. This assumption seems to be confirmed by the reviews of Teleperformance employees from the same source.[147] Employee reviews also generally emphasised the *"great"* and *"fun"* place to work.

The majority of Teleperformance employees are on permanent contracts (110,203 out of 148,571 employees in total in 2013), a smaller part are on fixed-term contracts (30,927 out of 148,571 in 2013), and a few on temporary contracts (7,441 out of 148,571 in 2013)[148].

Teleperformance is a customer care service provider delivering digital solutions, connection, analytics solutions, and multichannel strategies for different IT and communication activities. Therefore, employees are required to possess qualifications mainly within IT, technical and communication skills etc. Of course, qualifications and skills vary according to the specific profession. For example, a job ad for Teleperformance Nordic emphasises *"tech skills, sales skills, and different Nordic language skills"*.[149]

The company also seems to value career development and mobility: In the same ad, it states that *"Many of our employees have started their career as an agent and then move on to become team leaders, quality assurance specialists, trainers and other"* (see footnote 166). On the Teleperformance British career website, the company also promotes career development and continuous training: *"Continuously upgrading skills and knowledge is vital in an ever changing environment and helps us meet the demands of our clients whilst growing our workforce skill sets from within. The Teleperformance Training and Development team, alongside HR, support and deliver a*

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[144] Teleperformance Annual Report 2013:111
[145] http://teleperformance.com/en-us/people-company/awards-and-recognition
[146] http://www.indeed.com/cmp/Teleperformance/salaries?from=jobs
[147] http://www.indeed.com/cmp/Teleperformance/reviews?from=salaries
[148] http://www.teleperformance.com/en-us/investor-relations/key-figures/employees
[149] http://www.teleperformancecareer.com/career.html

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range of courses to employees across the UK that has been designed to help our people succeed in their current roles and develop their skills for the future"[150].

4.5.3 Industrial relations

Collective bargaining and social dialogue

Teleperformance, as mentioned on its website, supports socially responsible goals, also with regards to collective bargaining, which the UN established in the Global Compact. Teleperformance has committed to adopting and applying the 10 universal principles under the United Nations Global Compact. One of the main principles under labour includes that businesses should allow and recognize the rights of workers to collectively bargain. Roughly 1/3 of its subsidiaries have their own collective bargaining agreement, which specifies number of working hours, salary increases, various forms of leave and remuneration. If no specific agreement exists for a specific geographical location, then the country's individual employment law applies and is usually supplemented by collective bargaining agreements.[151]

Outsourcing

Teleperformance provides ICT services for companies outside the telecommunications and ICT sectors. Its annual report focuses on outsourcing as a service provided by the company, and not as a strategy to optimize its services at cheaper costs. Yet, the discussion made in the previous sections sheds light to disputes in Teleperformance's outsourcing/offshoring locations.

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[150] http://teleperformanceukcareers.co.uk/career-development/
[151] Teleperformance Annual Report 2013:111

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5   Overview of interviewees contacted

Table 5-1 below presents an overview of 133 organisations invited to participate in the interview that contributed to the mapping of the telecommunications and ICT sectors. The organisations are divided by type and status of our communication, namely, interview *completed*, *scheduled*, *rejected* and *invited*.

Table 5-1   Overview of the organisations invited to take part on the project, and interviews conducted.

Type of organisation	Country	Name	Status
Employer organisation	Bulgaria	BASSCOM - Bulgarian Association of Software Companies	Completed
Employer organisation	Bulgaria	ICT Cluster Bulgaria	Completed
Employee organisation	Denmark	Dansk Metal	Completed
Employee organisation	Denmark	IDA - The society of Danish engineers	Completed
Employer organisation	Denmark	DI ITEK	Completed
Employer organisation	Denmark	IT-Branchen	Completed
Country organisation (multinational)	Estonia	AS Proekspert	Completed
Trade union	EU	UNI Europa	Completed
Trade union	EU	CESI	Completed
Trade union	EU	industriAll	Completed
Employer organisation	EU	EITO	Completed
Employer organisation	EU	Italian National Internet Providers Association	Completed
Employer organisation	EU	Digital Europe	Completed
Employer organisation	EU	ETNO	Completed
Employer organisation	EU	PIN-SME	Completed
Employer organisation	EU	OW2	Completed
Employer organisation	EU	Wind	Completed
Trade union	France	F3F CFDT - Fédération Communication Conseil Culture	Completed
Trade union	France	UGICT-CGT - Union Générale des Ingénieurs, Cadres et Techniciens	Completed
Employer organisation	Germany	BITKOM	Completed

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Type of organisation	Country	Name	Status
Trade union	Germany	ver.di ICT department	Completed
Trade union	Germany	IG Metall	Completed
Trade union	Germany	ver.di Telecommunication and call centre department	Completed
Trade union	Germany / EU Level	DPVKOM / CESI	Completed
Multinational	Global	Telenor	Completed
Multinational	Global	Telefónica	Completed
Multinational	Global	IBM	Completed
Multinational	Global	Vodafone	Completed
Trade union	Ireland	CWU - Communications Workers' Union	Completed
Trade union	Portugal	Sinttav	Completed
Trade union	Portugal	SINDTELCO - Sindicato Democrático dos Trabalhadores das Comunicacões e dos Media	Completed
Trade union	Portugal	STPT - Sindicato dos Trabalhadores do Grupo Portugal Telecom	Completed
Employer organisation	Portugal	Inova-ria	Completed
Trade union	Romania	FSCOM - Trade Union Federation of Communication	Completed
Country organisation (multinational)	Bulgaria	Vivacom	Invited
Trade union	Bulgaria	CITUB - Confederation of Independent Trade Unions	Invited
Trade union	Bulgaria	PTT-PODKREPA - Federation des PPT Podkrepa	Invited
Employer organisation	Bulgaria	BWA - Bulgarian Web Association	Invited
Employer organisation	Bulgaria	CEIBG The Confederation of Employers and Industrialist in Bulgaria	Invited
Employer organisation	Bulgaria	UPEE - Union for Private Economic Enterprise (SMEs)	Invited
Employer organisation	Bulgaria	SINDFES	Invited
Employer organisation	Bulgaria	BAIT - Bulgarian Association of Information Technologies	Invited
Professional organisation	Bulgaria	Promyana Union	Invited
Trade union	Czech Republic	OS-ECHO	Invited
Trade union	Czech Republic	OSZPTNS	Invited
Employer organisation	Czech Republic	Czech ICT Alliance	Invited

Type of organisation	Country	Name	Status
Employer organisation	Czech Republic	EIA	Invited
Employer organisation	Czech Republic	Czech Chamber of Commerce	Invited
Trade union	Denmark	DEF - Danish Union of Eletricians	Invited
Trade union	Denmark	HK	Invited
Trade union	Denmark	PROSA - Danish Association of IT professionals	Invited
Trade union	Denmark	TL - National Union of Technicians	Invited
Employer organisation	Denmark	Telekommunikationsindustrien i Danmark	Invited
Employer organisation	Denmark	ITB - The Danish IT Industry Association	Invited
Employer organisation	Denmark	It-forum	Invited
Trade union	Estonia	Telco & IT Trade Union	Invited
Trade union	Estonia	ESTAL - Estonian Communication and Service Worker's Trade Union	Invited
Employer organisation	Estonia	ITL - Association of Information Technology and Telecommunications	Invited
Trade union	Estonia	Estonia Trade Union Confederation	Invited
Trade union	EU	ETUC - Confederation European Trade Union	Invited
Trade union	EU	BASTUN Baltic Sea Trade Union Network	Invited
Employer organisation	EU	BSA - The Software Alliance	Invited
Employer organisation	EU	EVCA - European Private Equity & Venture Capital Association	Invited
Employer organisation	EU	CEEOA - Central and Eastern European Outsourcing Association	Invited
Employer organisation	EU	GMSA - Group Speciale Mobile Association	Invited
Employer organisation	EU	Centre of Employers and Enterprises Providing Public Services	Invited
Employer organisation	EU	CEA-PME	Invited
Employer organisation	EU	WITSA	Invited
Employer organisation	EU	VISEGRAD Group	Invited
Employer organisation	EU	IOE	Invited
Employer organisation	EU	CEEMET	Invited
Employer	EU	ESOA	Invited

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Type of organisation	Country	Name	Status
organisation			
Employer organisation	EU	ECTA - European Competitive Telecommunications Association	Invited
Employer organisation	EU	EASST - European Association of Software Science and Technology	Invited
Employer organisation	EU	CEPIS - Council of European Professional Informatics Societies	Invited
Employer organisation	EU	IT Star	Invited
Employer organisation	France	Orange	Invited
Employer organisation	France	TDF	Invited
Employer organisation	France	SFR	Invited
Employer organisation	France	Bouygues Telecom	Invited
Employer organisation	France	Free	Invited
Employer organisation	France	TELECOM 1	Invited
Trade union	France	FAPT-CGT - Fédération Nationale des salariés du secteur des activités postales et de télécommunications	Invited
Trade union	France	FIEEC - Fédération des Industries Electriques et de Communication	Invited
Trade union	France	FEC-FO - Fédération des Employés et Cadres, Force Ouvrière	Invited
Trade union	France	FNPSECP - Fédération CGT des Sociétés d´Etudes	Invited
Trade union	France	FO-CADRES - Union des Cadres et Ingénieurs	Invited
Trade union	France	SFIB	Invited
Employer organisation	France	SIMAVELEC - Syndicat des industries des materiels audivisuels electronique	Invited
Employer organisation	France	UNETEL-RST - Union Nationale des Entreprises de Télécommunications, de Réseaux et de Services en Télécomunications	Invited
Employer organisation	France	GPNI - Groupement Professionnel National de l'Informatique	Invited
Employer organisation	Germany	BITMI	Invited
Employer organisation	Germany	eco – Verband der Internetwirtschaft	Invited
Multinational	Global	Nokia	Invited

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Type of organisation	Country	Name	Status
Multinational	Global	Ericsson	Invited
Multinational	Global	Acxiom	Invited
Multinational	Global	Teleperformance	Invited
Country organisation (multinational)	Ireland	Eircom	Invited
Country organisation (multinational)	Ireland	BT Ireland	Invited
Country organisation (multinational)	Ireland	ESB Group	Invited
Country organisation (multinational)	Ireland	UPC Ireland	Invited
Country organisation (multinational)	Ireland	3 Ireland	Invited
Country organisation (multinational)	Ireland	O_2 Ireland	Invited
Country organisation (multinational)	Ireland	Meteor (Eircom)	Invited
Worker organisation	Ireland	CPSU - Civil Public Service Union	Invited
Worker organisation	Ireland	PSEU - Public Service Executive Union	Invited
Worker organisation	Ireland	SIPTU - Services Industrial Professional Technical Union	Invited
Worker organisation	Ireland	TEEU	Invited
Employer organisation	Ireland	ICT Ireland	Invited
Employer organisation	Ireland	SFA	Invited
Employer organisation	Ireland	TIF - Telecommunication and Internet Federation	Invited
Country organisation (multinational)	Portugal	Portugal Telecom	Invited
Country organisation (multinational)	Portugal	TMN/MEO	Invited
Country organisation (multinational)	Portugal	NOS	Invited
Country organisation (multinational)	Portugal	Optimus	Invited
Trade union	Portugal	CPQTC -	Invited
Trade union	Portugal	SERS - Sindicato dos Engenheiros da Região Sul	Invited
Trade union	Portugal	SITESE - Sindicato dos Trabalhadores de Escritório, Comércio, Hotelaria e Servicos	Invited

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Type of organisation	Country	Name	Status
Trade union	Portugal	SNTCT - Sindicato Nacional dos Trabalhadores dos Correios e Telecomunicacões	Invited
Employer organisation	Portugal	AGEFE	Invited
Employer organisation	Portugal	ANETIE	Invited
Employer organisation	Portugal	CIP - Business Confederations of Portugal	Invited
Employer organisation	Portugal	TICE-P.T.	Invited
Employer organisation	Portugal	AIP - Associcão Industrial Portuguese	Invited
Employer organisation	Portugal	APDC	Invited
Country organisation (multinational)	Romania	RADIOCOM	Invited
Country organisation (multinational)	Romania	Romtelecom	Invited
Country organisation (multinational)	Romania	UPC Romania	Invited
Country organisation (multinational)	Romania	RCS & RDS	Invited
Trade union	Romania	FSRT - Federatia Sindicatelor Dim Romtelecom	Invited
Trade union	Romania	FSTC - Trade Union Telecommunication	Invited
Employer organisation	Romania	ATIC - Association for Information Technology and Communication (member of witsa)	Invited
Employer organisation	Romania	CNIPMMR - Consiliul National al Intreprinderilor Private Mici si Mijlocii din Romania	Invited
Employer organisation	Romania	ANIS	Invited
Employer organisation	Romania	ARIES	Invited
Country organisation (multinational)	Denmark	TDC	Rejected[152]
Employer	EU	ESIA - The European Semiconductor Industry	Rejected

[152] The organisations that rejected the opportunity to take part on the interview did so because their representatives considered the project, namely, the interview questions, too broad to be approached by an umbrella organisation (BUSINESSEUROPE, Cable Europe, Czech Telecommunications Office, ESIA, EuroIspa and UEAPME) or because there were no available resources to allocate for this interview (TDC). BUSINESSEUROPE and EuroIspa forwarded our invitation to their respective members, but we were only contacted by a member of the latter group.

Type of organisation	Country	Name	Status
organisation		Association	
Employer organisation	EU	BussinessEurope	Rejected
Employer organisation	EU	UEAPME	Rejected
Employer organisation	EU	Cable Europe	Rejected
Employer organisation	EU	EuroIspa	Rejected
Employer organisation	Czech Republic	Czech Telecommunication Office	Rejected

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6   Interview guide

The interview questions contained in this guide will contribute to a mapping of the structural changes and their impacts on jobs and industrial relations in the Telecommunication and ICT sectors in the EU. This mapping done by COWI will help the Commission understand the current structures of the Telecommunication and ICT sectors and so the scope and the potential for collective bargaining across Europe.

The interview questions cover in practice three themes:

Boundaries of the sectors – where the starting point is the acknowledgement that the landscape of the Telecommunication and ICT sectors is complex and is changing rapidly, making the boundaries of the sectors increasingly blurred. The aim of the study is therefore – via a thorough mapping – to provide input for a better understanding of the boundaries of the sectors.

Employment and working conditions – where the starting point is that the blurred boundaries make it increasingly difficult to determine sectoral employment. Furthermore, the increasing degree of sector complexity, competition, productivity, and technological convergence has challenged the traditional organisation of work and are redefining the relationships between market actors. Hence, the aim of the study is to contribute to the analysis of employment and working conditions by looking into technological changes and changes to job characteristics.

Industrial relations – where the aim is to look into what the changes to the boundaries and to the employment and working conditions imply for the sectoral industrial relations between employers and employees.

During the interview we will make use of three types of questions:

Open questions have no predefined options, and you will be asked to supply your own answers.

Closed questions involve a *yes* or *no* answer.

Scale rating questions are answered by indicating on a scale from 1 to 5 your assessment of the statements.

All interview questions will be open for your elaboration on the topic and is expected to be done in around one hour and a half.

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Background information about the respondent

This section will be completed by COWI

Information about respondent	
Name	
Email	
Telephone number	

Additional information about <u>organisations</u> (completed by COWI)

Information about your organisation	
Name of the organisation	
Country origin of the organisation (country specific, pan-European, international)	
Which subsector(s) does the organisation represent?	
Which type of organisation is it (e.g. employer representative, worker representative, etc.)?	
How many members does the organisation represent?	

Additional information about <u>multinational companies</u> (completed by COWI)

Information about your company	
Name of the company	
Country origin of the company	
Which subsector(s) does the company have activities within?	
How many does the company employ in EU?	

Boundaries of the sectors
Alternative definitions

Firstly, we would like you to help us define the boundaries of the Telecommunication and ICT sectors by confronting you with a number of alternative definitions.

These definitions rely on a broad, medium or narrow characterization of these sectors. Supporting a broader definition of the sectors is the heterogeneous and fragmented nature of the Telecommunication and ICT sectors, in which a convergence in terms of both products and services has taken place.

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Supporting the narrow definition, on the other hand, is the increased specialisation that has occurred in the Telecommunication and ICT sectors, thus accounting for a narrower share of the market. This definition, however, does not include the broad range of stakeholders involved in these sectors.

Please provide your opinion of the following questions and statements, where after you have the possibility to formulate your own definition.

The starting point of this interview is the following NACE codes:

61: Telecommunications,
62: Computer programming, consultancy and related activities,
63: Information service activities, and
82.20: Activities of call centres.

Referring to these codes, please supply your assessment of the following statement:

"The suitable definition of the Telecommunication and ICT sectors is a narrow one covering the areas that are specified by the activities encompassed by the before mentioned NACE codes."

Do you think that this definition is accurate? Please elaborate.

Do you identify unnecessary or excluded activities in the codes?

OECD defined the Telecommunication and ICT sectors in 2006-07 as the following:

"The production (goods and services) of a candidate industry must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display".

These activities can be encompassed by the following NACE codes:

26: Manufacturing,
46: Trade,
58: Services,
61: Telecommunications,
62: Computer programming, consultancy and related activities,
63: Information service activities, and
95.1: Repair.

See also the forwarded guide for an elaboration on the content of the codes.

a) Do you think that the OECD definition of the Telecommunication and ICT sectors is better to describe the sectors than the definition given in question 0? Please explain.

Do you identify unnecessary or excluded activities in the codes?

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ITU defined the Telecommunication and ICT in 2012 based on the following policy:

> *"ICT products must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display".*

Besides the industries for ICT manufacturing, ICT trade and ICT services, this definition also includes, within the telecommunications sectors, the Wired telecommunications activities, Wireless telecommunications activities, Satellite telecommunications activities, and Other telecommunications activities.

b) Do you think that the ITU definition of the Telecommunication and ICT sectors is better to describe the sectors than the definition given in question 0? Please explain.

Do you identify unnecessary or excluded activities in the codes?

c)
d) Please specify a definition your organisation finds to fit the Telecommunication and ICT sectors best:

e) Why is this the best fit in your opinion?

Overlaps with other areas

The structural landscape of Telecommunication and ICT sectors is characterized by rapid restructuring and economic growth driven by new technologies, liberalisation, deregulation and privatisation. This movement has increased the overlapping areas of Telecommunication and ICT with services such as voice telephony, online-communications and broadcast media.

Please supply your assessment of the following statement:

"The overlapping areas of the Telecommunication and ICT sectors represent an increasing part of the economic activities in these sectors."

Do you agree with this statement? – on a scale from 1 to 5.

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1	Do not agree at all	
2	Do not agree	
3	Do neither agree nor disagree	
4	Do agree	
5	Do fully agree	
	Don't know	

Please elaborate on your answer.

How would you rate the economic activities of the Telecommunication and ICT sectors?

1	Homogeneous	
2	A little heterogeneous	
3	Somewhat heterogeneous	
4	Very heterogeneous	
5	Extremely heterogeneous	
	Don't know	

Please elaborate on your answer

What contributes to the heterogeneity of economic activities in the sectors?

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