

A ICT specialists

A.1 Numbers and earnings of ICT specialists

ICT specialists are **defined** on the basis of the **International Standard Classification of Occupations (ISCO-08)** and corresponding national classification in the Czech Republic (CZ-ISCO).

The occupations of ICT specialists based on recommendations of Eurostat and the International Labour Organisation (ILO) are subdivided into **two main categories** that include following codes (groups and subgroups) of the CZ-ISCO classification:

- **ICT managers, professionals and engineers** include ICT service managers (133); Software & applications developers and analysts (251); Database and network professionals (252); ICT sales professionals (2434) and Electronics & Telecommunication (ICT) engineers (2152+2153).
- **ICT technicians, installers and servicers** include ICT operations and user support technicians (351); Telecommunications and broadcasting technicians (352); Electronics engineering technicians (3114) and Electronics & telecommunications (ICT) installers and repairers (742).

In a **narrower definition of ICT specialists** are ICT occupations divided only between **ICT professionals (ISCO 25)** and **ICT technicians (ISCO 35)**. Such definition is used for information on earnings of ICT specialists.

Data on the **numbers** of ICT specialists come from the **Labour Force Sample Survey (LFS)** of the Czech Statistical Office (CZSO). The table presents average annual data for a given year. Data since 2011 are not fully comparable with data for the previous years because of transition to the ICT specialists' definition by the CZ-ISCO. The **Eurostat LFS Database** was used for the international comparison

For further information on the Czech LFS see:

<https://www.czso.cz/csu/czso/employment-and-unemployment-as-measured-by-labour-force-survey-annual-averages-2017>

Data on **gross monthly earnings** of ICT specialists come from the **Structural Earnings Statistics (SES)** and are available in a comparable time series since the reference year 2012. For further information see:

<https://www.czso.cz/csu/czso/structure-of-earnings-survey-2017>

Data about numbers and earnings of ICT specialists is available **by occupation and individual characteristics of ICT specialists** such as gender, age groups, highest education attainment or main economic activity.

A.2 University students and graduates of ICT fields of education

Numbers of ICT students and graduates are based on the International Classification of Education (**ISCED-F 2013**), broad field code **06 Information and Communication Technologies** that involves detailed defined fields of education as follows: Computer use (0611); Database and network design and administration (0612); Software and applications development and analysis (0613); ICT not elsewhere classified (0619); and Inter-disciplinary programmes and qualifications involving ICT (0688).

Data on ICT field of education come from the **Ministry of Education, Youth and Sports (MEYS)** from the Union Information from Students' Registers (**SIMS database**). Data on university students are always as at 31 December of the reference year; data on graduates are for the entire school year.

For further information on ICT specialists see (only in Czech):

<https://www.czso.cz/csu/czso/ict-odbornici>

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Table A1 ICT specialists in the Czech Republic

	Thousand persons	
	2012	2017
Total	160,5	185,6
of which woman ICT specialists	16,3	17,8
Occupation		
ICT managers, professionals and engineers, total	67,1	88,4
of which Software & apps developers and analysts	34,7	47,8
ICT technicians, installers and servicers, total	93,5	97,3
of which ICT operations & user support technicians	48,4	56,2
Age group		
20-29 years	39,1	38,0
30-39 years	60,7	70,4
40-49 years	35,2	44,0
50+ years	25,2	33,1
Highest level of education attainment		
Tertiary	85,0	105,5
Secondary with A-level examination	61,7	69,3
Other (lower)	13,8	10,8

Figure A1 ICT specialists, total

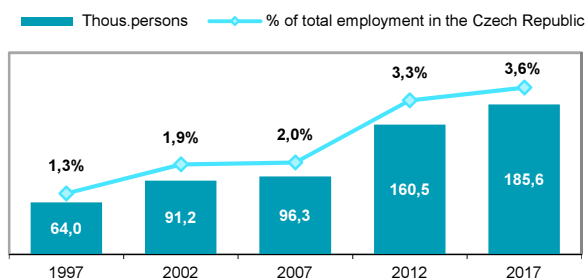
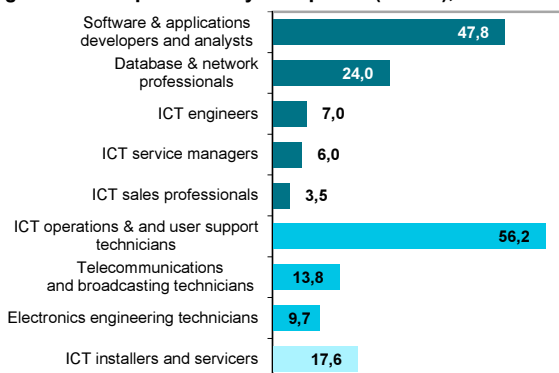


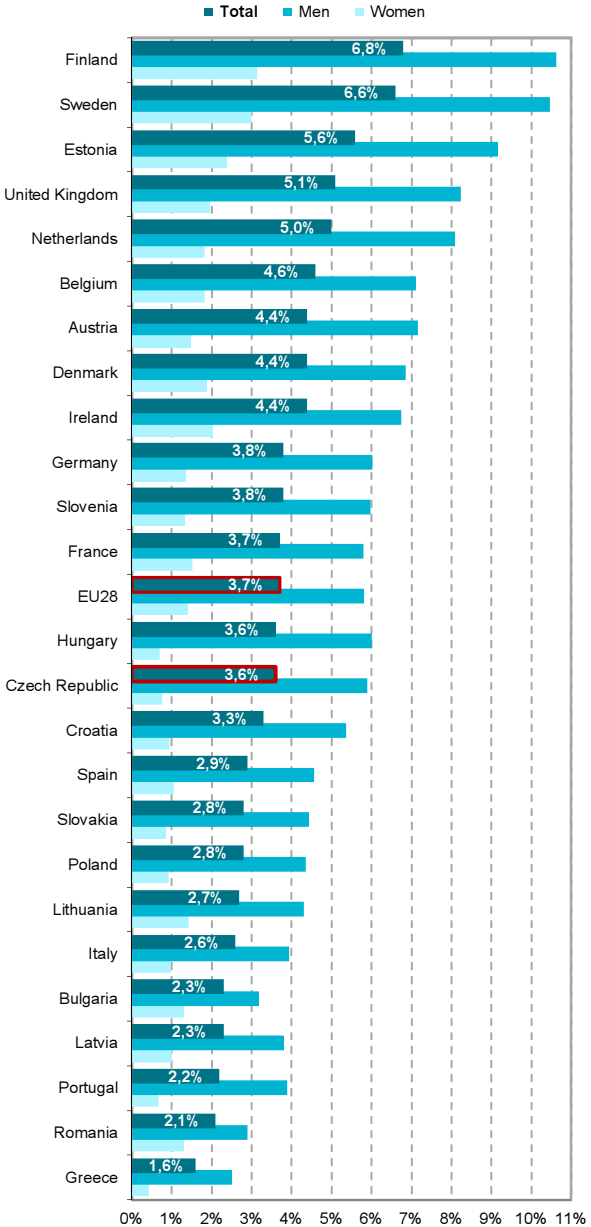
Figure A2 ICT specialists by occupation (thous.); 2017



Source: CZSO, Labour Force Survey

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Figure A3 ICT specialists in EU countries; 2017
(as a percentage of total, men and women employment)



Source: CZSO calculation based on Eurostat LFS Database

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Table A2 ICT managers, professionals and engineers in the Czech Republic

	Thousand persons	
	2012	2017
Total	67,1	88,4
Women	5,6	9,4
Occupation		
ICT professionals (ISCO 25), total	53,2	71,9
Software and applications developers and analysts	34,7	47,8
Database and network professionals	18,5	24,0
Other ICT managers, professionals and engineers	13,8	16,5
Age group		
20-29 years	14,3	16,7
30-39 years	26,9	34,7
40-49 years	14,9	21,9
50+ years	10,9	14,9
Highest level of education attainment		
Master's and Doctoral	49,1	62,9
Bachelor's and Higher professional	8,4	13,7
Other (lower)	9,6	10,8

Figure A4 ICT professionals, total

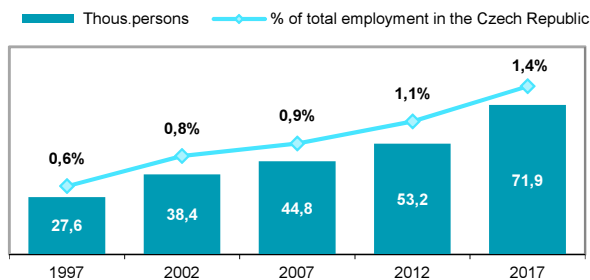


Figure A5 ICT professionals by gender

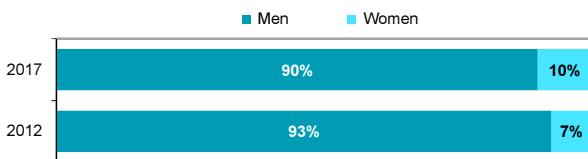
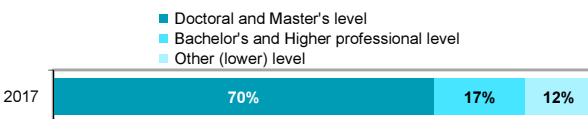


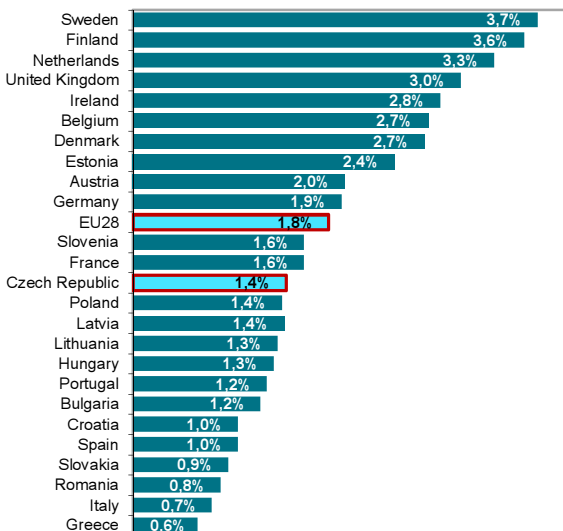
Figure A6 ICT professionals by education



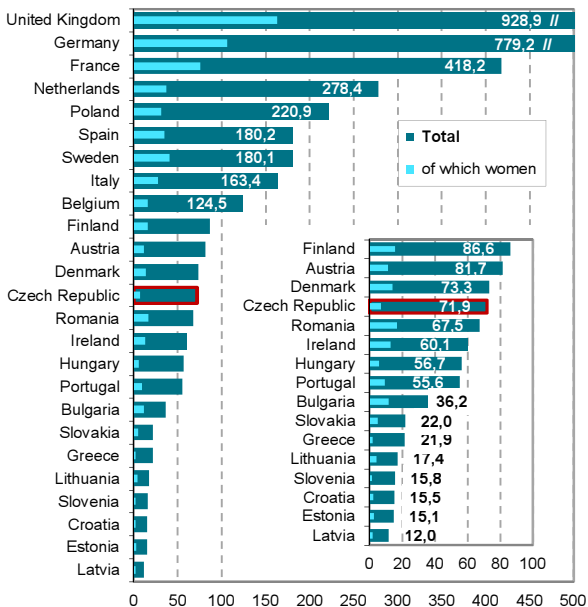
Source: CZSO, Labour Force Survey

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**Figure A7 ICT professionals in EU countries; 2017
(as a percentage of total employment)**



**Figure A8 ICT professionals in EU countries; 2017
(thous. persons)**



Source: CZSO calculation based on Eurostat LFS Database

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Table A3 ICT technicians, installers and servicers in the Czech Republic

	Thousand persons	
	2012	2017
Total	93,5	97,3
of which women	10,7	8,5
Occupation		
ICT technicians (ISCO 35), total	60,7	70,0
ICT operations and user support technicians	48,4	56,2
Telecommunications and broadcasting technicians	12,0	13,8
Other ICT technicians, installers and servicers	32,7	27,3
Age group		
20-29 years	24,9	21,3
30-39 years	33,8	35,6
40-49 years	20,2	22,0
50+ years	14,5	18,1
Highest level of education attainment		
Tertiary	27,6	28,9
Secondary with A-level examination	52,7	58,4
Other (lower)	13,1	9,9

Figure A9 ICT technicians, total

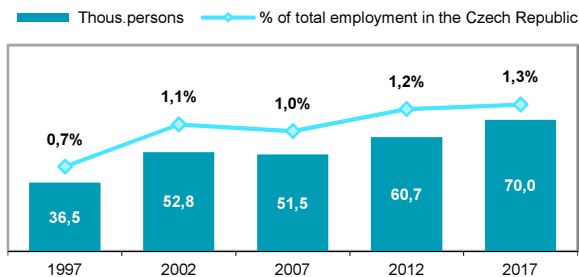


Figure A10 ICT technicians by gender

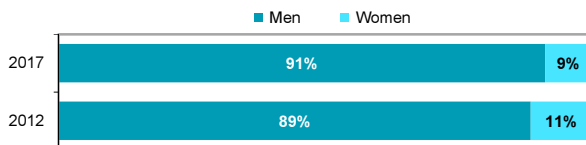
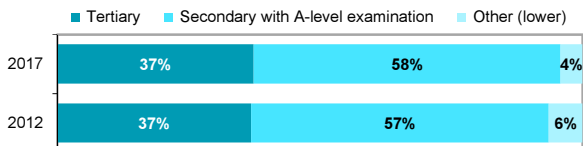


Figure A11 ICT technicians by education



Source: CZSO, Labour Force Survey

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Figure A12 ICT technicians in EU countries; 2017
(as a percentage of total employment)

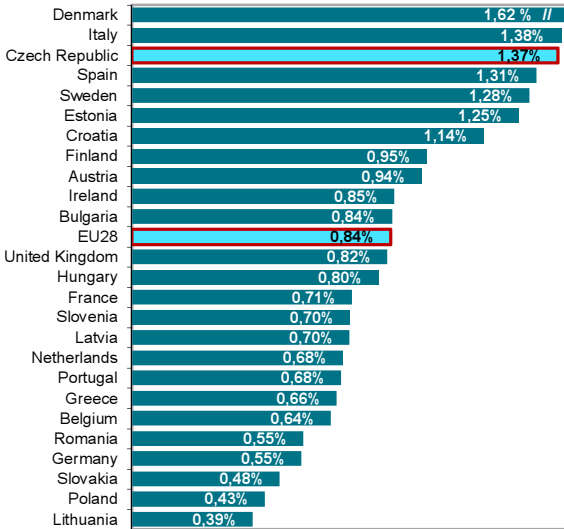
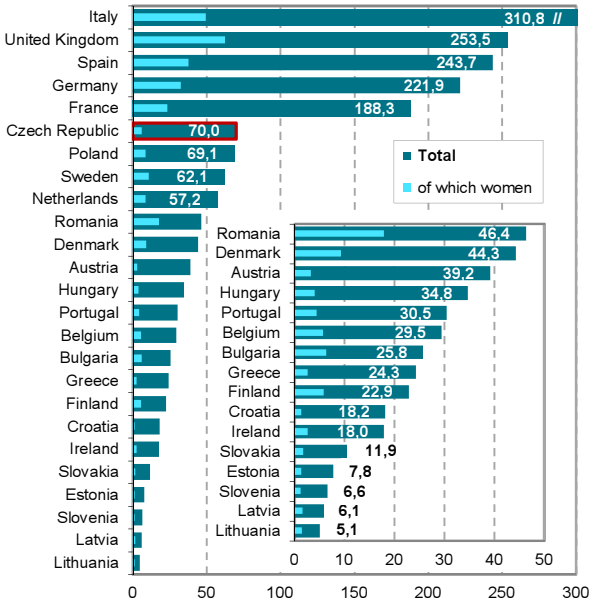


Figure A13 ICT technicians in EU countries; 2017
(thous. persons)



Source: CZSO calculation based on Eurostat LFS Database

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Table A4 Earnings of ICT professionals in the Czech Republic

average gross monthly earnings in CZK

	2015	2016	2017
Total	51 319	53 241	56 747
Men	52 296	54 325	58 025
Women	43 701	45 369	47 765
Sphere of activity (earnings)			
Business (wage sphere)	52 643	54 391	57 810
Government (salary sphere)	33 607	35 422	38 876
Age group			
under 24 years	28 393	30 237	33 034
25-34 years	47 296	48 582	51 487
35-44 years	58 751	60 624	65 206
45-54 years	52 543	55 882	59 965
55+ years	46 338	49 522	51 652
Highest level of education attainment			
Master's and Doctoral	56 172	58 831	62 809
Bachelor's and Higher professional	46 238	48 644	51 906
Secondary with A-level examination	44 930	47 751	50 723

Figure A14 Earnings of ICT professionals by sphere of activity

- Average gross monthly earnings in thous. CZK
- ▲ as % of average gross monthly earnings in the total, wage and salary sphere

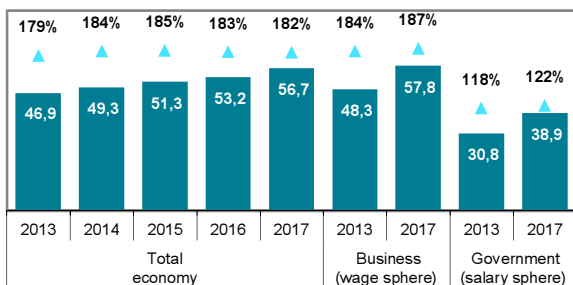
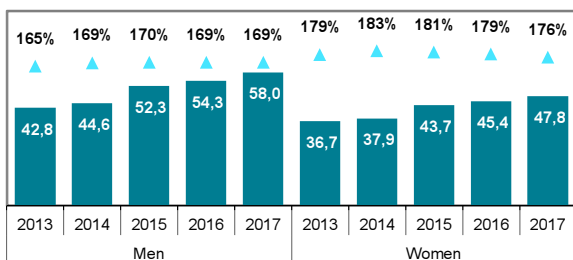


Figure A15 Earnings of ICT professionals by gender

- Average gross monthly earnings in thous. CZK
- ▲ as % of average gross monthly earnings of all men and women workers



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Table A5 Earnings of ICT professionals in the Czech Republic according to their occupation and industry

average gross monthly earnings in CZK

	2015	2016	2017
Total	51 319	53 241	56 747
Selected occupations (ISCO unit groups)			
Systems analysts (ISCO 2511)	56 843	58 868	61 883
Software developers (ISCO 2512)	55 216	58 049	61 157
Applications programmers (ISCO 2514)	49 620	51 210	54 343
Database designers/admin. (ISCO 2521)	47 001	49 319	52 646
Systems administrators (ISCO 2522)	45 306	47 432	49 375
Data security specialists (ISCO 2524)	58 789	61 073	58 267
Selected industries (NACE Sections)			
Manufacturing (NACE: C)	45 769	46 246	50 159
Wholesale and retail trade (NACE: G)	40 868	41 938	48 326
Information and communication (NACE: J)	56 457	57 786	61 457
Financial and insurance activities (NACE: K)	61 962	64 436	65 182
Public administration (NACE: O)	34 929	36 657	40 278
Education (NACE: P)	35 763	37 421	39 543
Human health and social work act. (NACE: Q)	36 649	37 713	40 663

Figure A16 Average gross monthly earnings of ICT professionals in selected occupations (CZK thousand)

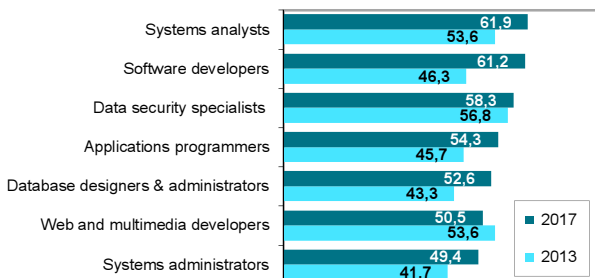
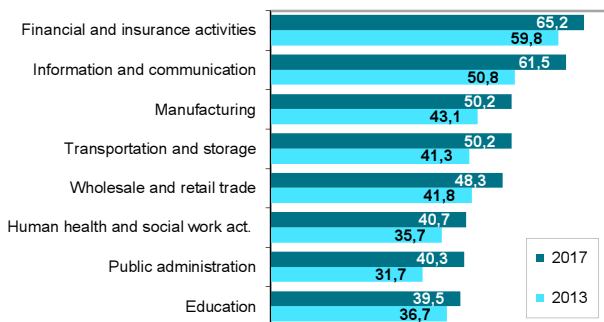


Figure A17 Average gross monthly earnings of ICT professionals in selected industries (CZK thousand)



Source: CZSO, Structural Earnings Statistics

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Table A6 Earnings of Software & applications developers and analysts in the Czech Republic

average gross monthly earnings in CZK

	2015	2016	2017
Total (CZ ISCO 251)	53 075	55 404	59 139
Men	54 062	56 531	60 429
Women	45 245	47 313	49 971
Sphere of activity (earnings)			
Business (wage sphere)	53 662	55 916	59 643
Government (salary sphere)	35 077	37 206	40 440
Age group			
25-34 years	48 513	50 215	53 341
35-44 years	62 326	65 529	69 853
45-54 years	53 637	58 844	62 380
55+ years	47 162	52 483	53 017
Highest level of education attainment			
Master's and Doctoral	57 285	60 297	64 665
Bachelor's and Higher professional	47 294	50 087	53 967
Secondary with A-level examination	46 164	49 530	52 361

Figure A18 Gross monthly earnings of software & apps developers and analysts by sphere of activity (CZK thous.)

■ Total economy ■ Business (wage sphere) ■ Government (salary sphere)

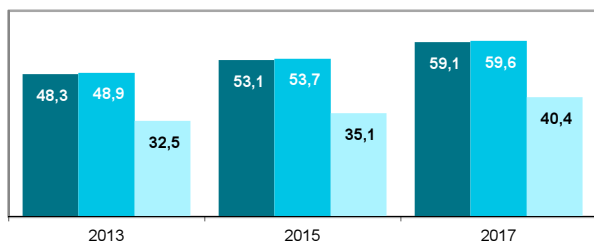
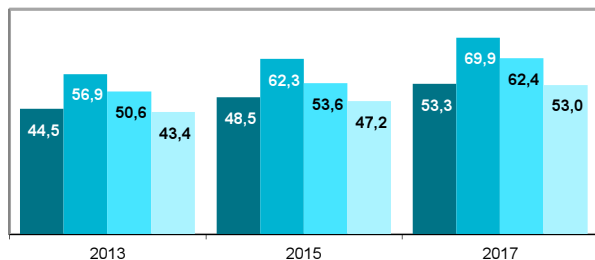


Figure A19 Average gross monthly wage of software and apps developers and analysts by age (CZK thous.)

■ 25-34 years ■ 35-44 years ■ 45-54 years ■ 55+ years



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Table A7 Earnings of ICT operations and user support technicians in the Czech Republic

average gross monthly earnings in CZK

	2015	2016	2017
Total (CZ ISCO 351)	36 724	38 376	39 612
Men	37 297	38 953	40 307
Women	32 899	34 574	35 084
Sphere of activity (earnings)			
Business (wage sphere)	37 437	39 126	40 387
Government (salary sphere)	28 377	29 883	31 200
Age group			
25-34 years	33 884	36 006	36 329
35-44 years	40 234	41 894	43 666
45-54 years	37 771	39 979	41 235
55+ years	38 352	38 370	39 161
Highest level of education attainment			
Master's and Doctoral	44 126	46 541	48 961
Bachelor's and Higher professional	37 345	40 499	41 245
Secondary with A-level examination	33 150	34 722	36 098
Secondary without A-level examination	29 781	29 540	30 926

Figure A20 Average gross monthly earnings of ICT operations & user support technicians by sphere of activity (CZK thous.)

■ Total economy ■ Business (wage sphere) ■ Government (salary sphere)

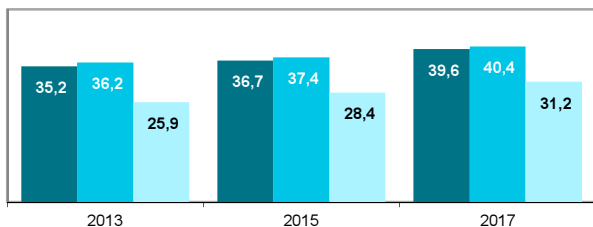
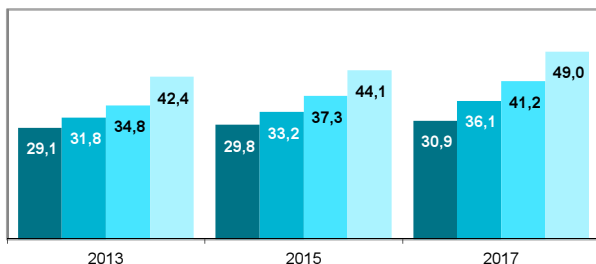


Figure A21 Average gross monthly earnings of ICT operations & user support technicians by education (CZK thous.)

■ Secondary without A-level examination ■ Secondary with A-level examination
 ■ Bachelor's and Higher professional ■ Master's and Doctoral



Source: CZSO, Structural Earnings Statistics

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Table A8 University students of ICT fields of education in the Czech Republic

	number of students		
	2015	2016	2017
Total	21 482	20 502	19 994
of which 25 years and older	5 061	4 909	4 814
Gender			
Men	18 390	17 358	16 848
Women	3 092	3 144	3 146
Study programme			
Bachelor (ISCED level 6)	14 424	13 956	13 830
Master (ISCED level 7)	6 119	5 662	5 341
Doctoral (ISCED level 8)	951	893	832
Nationality			
Czech	17 056	15 830	15 137
Foreigners	4 426	4 673	4 857

Figure A22 University students of ICT fields of education

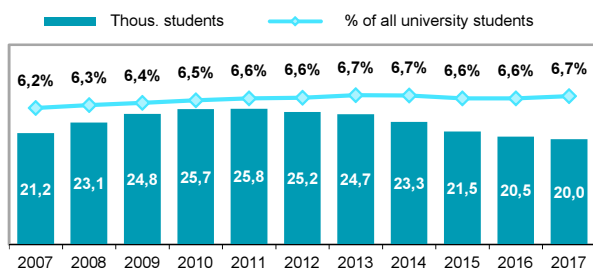


Figure A23 University students of ICT education by gender

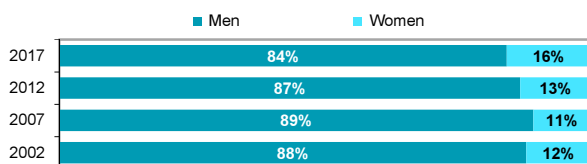


Figure A24 University students of ICT education by nationality

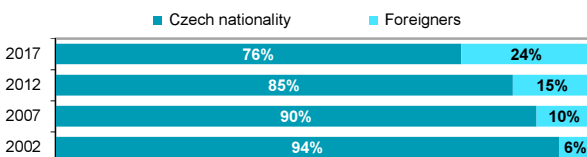
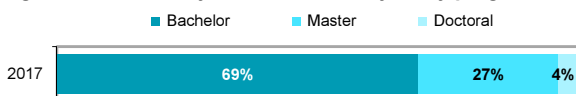


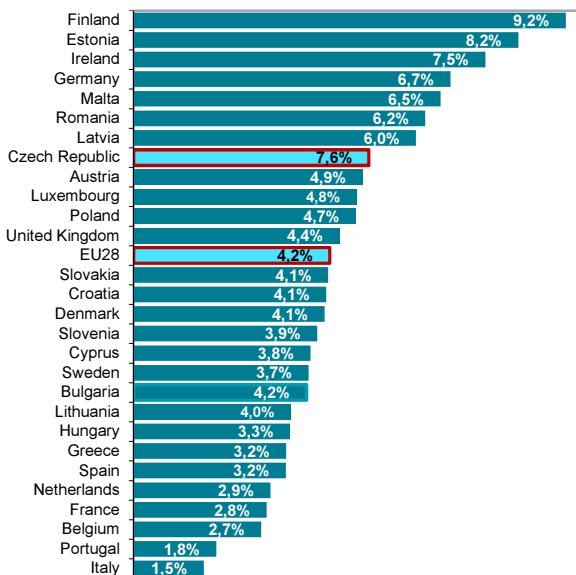
Figure A25 University students of ICT by study programme



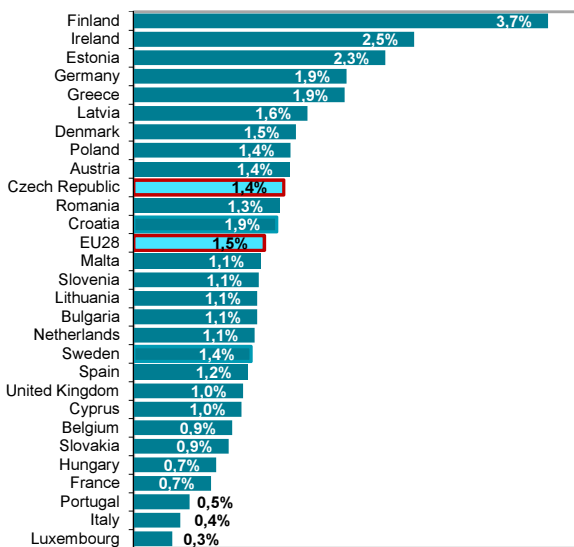
Source: CZSO calculation based on MEYS database

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**Figure A26 Tertiary students* of ICT; 2016
(as a percentage of all tertiary students*)**



**Figure A27 Tertiary students* of ICT; 2016
(as a percentage of population aged 20 to 29 years)**



* Tertiary education comprises here only ISCED-2011 classification levels 6 (Bachelor or equivalent level) and 7 (Master or equivalent level).

Source: CZSO calculation based on Eurostat database

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Table A9 Students of ICT fields of education in bachelor programmes in the Czech Republic

	number of students		
	2015	2016	2017
Total	14 424	13 956	13 830
of which 25 years and older	1 795	1 840	1 872
Gender			
Men	12 454	11 919	11 807
Women	1 970	2 037	2 023
Nationality			
Czech	11 371	10 685	10 517
Foreigners	3 053	3 271	3 313

Figure A28 Bachelor's students of ICT fields of education, total

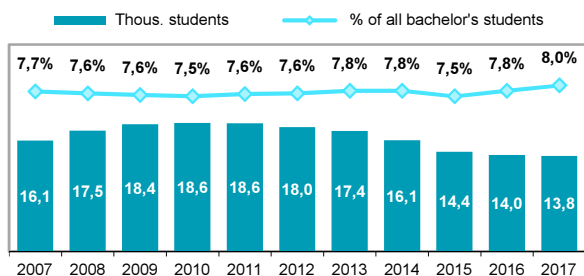


Figure A29 Bachelor's students of ICT education - men

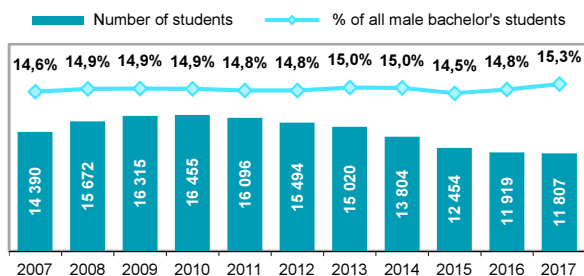
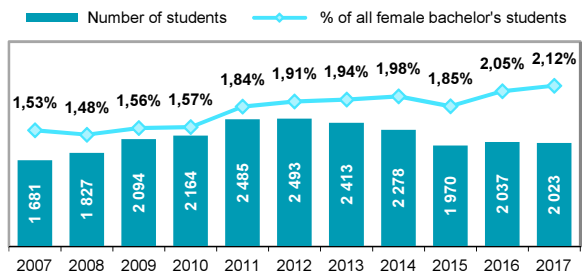


Figure A30 Bachelor's students of ICT education - women



Source: CZSO calculation based on MEYS database

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Figure A31 Bachelor's students* of ICT fields of education; 2016 (thousand students)

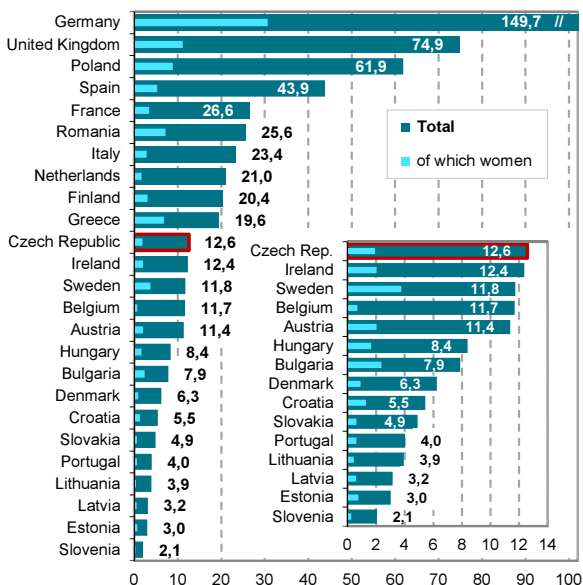
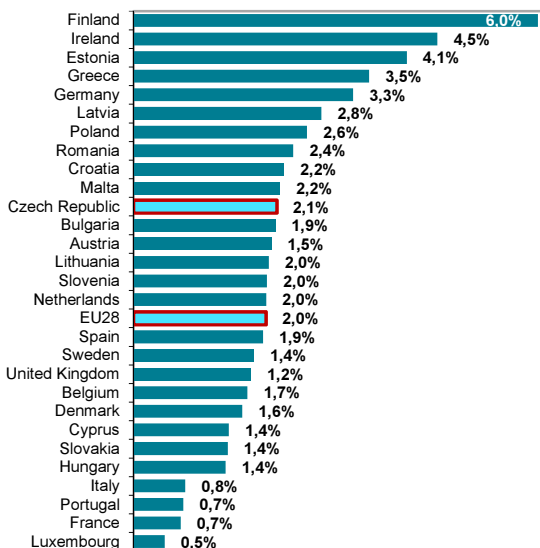


Figure A32 Bachelor's students* of ICT education; 2016 (as a percentage of population aged 20 to 24 years)



* ISCED level 6

Source: CZSO calculation based on Eurostat database

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Table A10 Students of ICT fields of education in master programmes in the Czech Republic

	number of students		
	2015	2016	2017
Total	6 119	5 662	5 341
of which 25 years and older	2 368	2 225	2 152
Gender			
Men	5 108	4 673	4 338
Women	1 011	989	1 003
Nationality			
Czech	4 939	4 454	4 004
Foreigners	1 180	1 209	1 337

Figure A33 Master's students of ICT fields of education, total

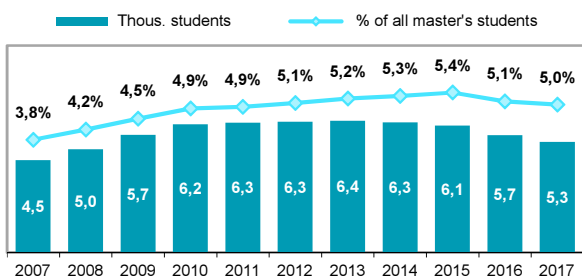


Figure A34 Master's students of ICT education- women

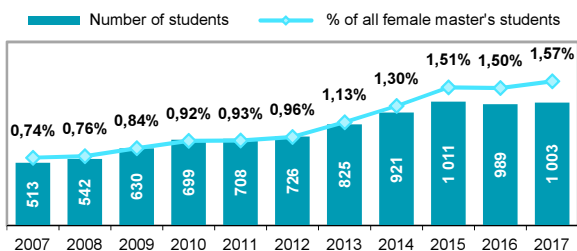
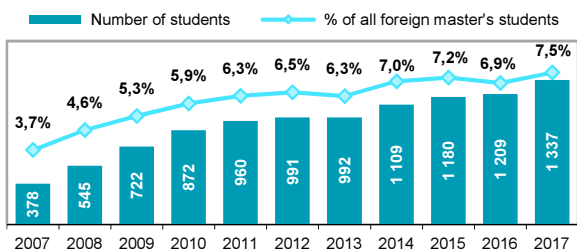


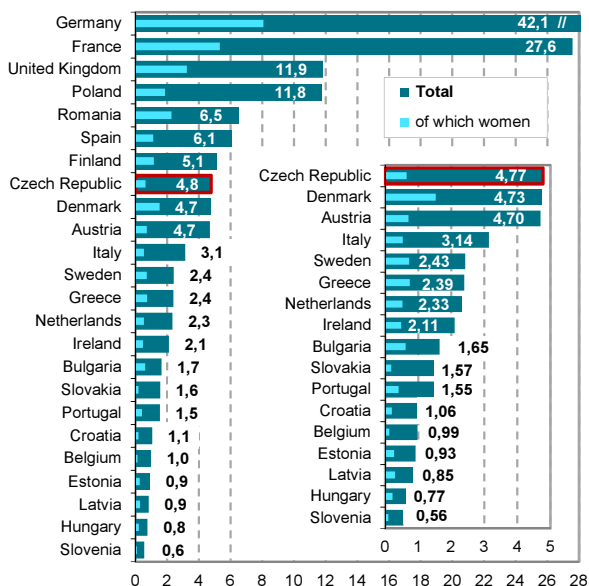
Figure A35 Master's students of ICT education - foreigners



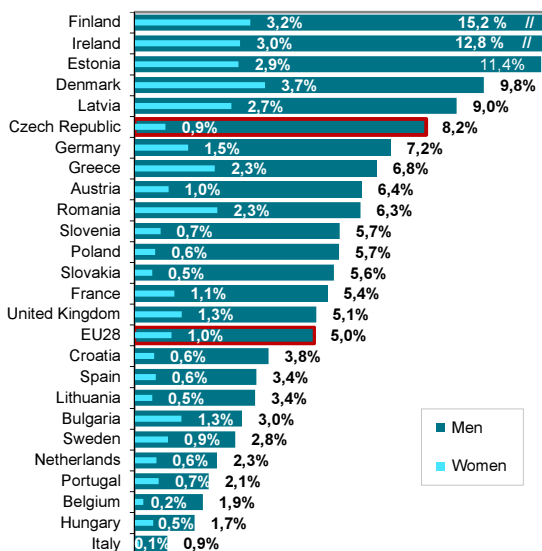
Source: CZSO calculation based on MEYS database

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**Figure A36 Master's students* of ICT fields of education; 2016
(thousand students)**



**Figure A37 Master's students* of ICT fields of education; 2016
(% of all students in master programmes)**



* ISCED level 7

Source: CZSO calculation based on Eurostat database

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Table A11 University graduates of ICT fields of education in the Czech Republic

	number of graduates		
	2015	2016	2017
Total	4 479	4 361	3 915
Men	3 815	3 678	3 312
Women	664	683	603
Study programme			
Bachelor (ISCED level 6)	2 579	2 291	2 079
Master (ISCED level 7)	1 828	1 986	1 750
Doctoral (ISCED level 8)	72	84	86
Nationality			
Czech	3 710	3 550	3 130
Foreigners	769	811	785

Figure A38 Bachelor programmes graduates of ICT education

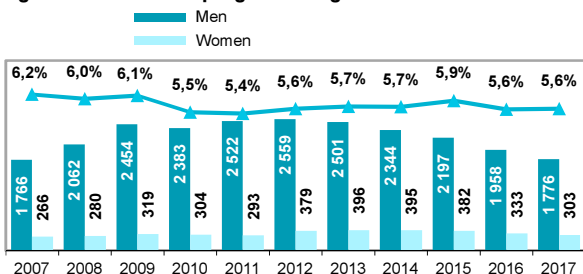


Figure A39 Master programmes graduates of ICT education

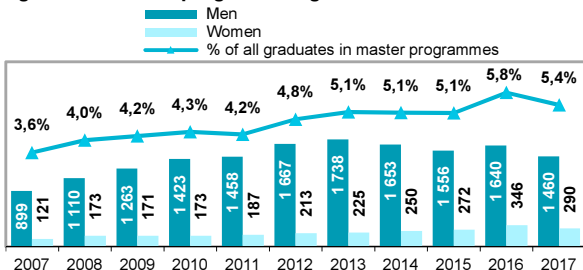
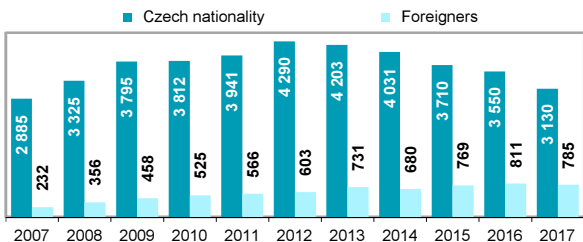


Figure A40 University graduates of ICT education by nationality



Source: CZSO calculation based on MEYS database

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Figure A41 Bachelor programmes graduates* of ICT fields of education; 2016 (Thousand persons)

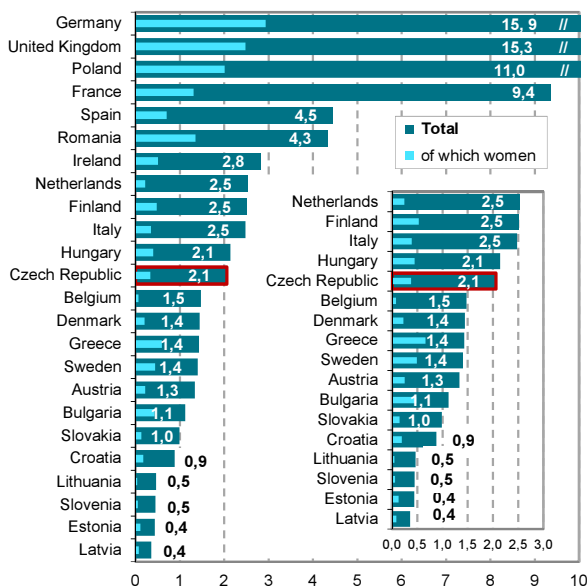
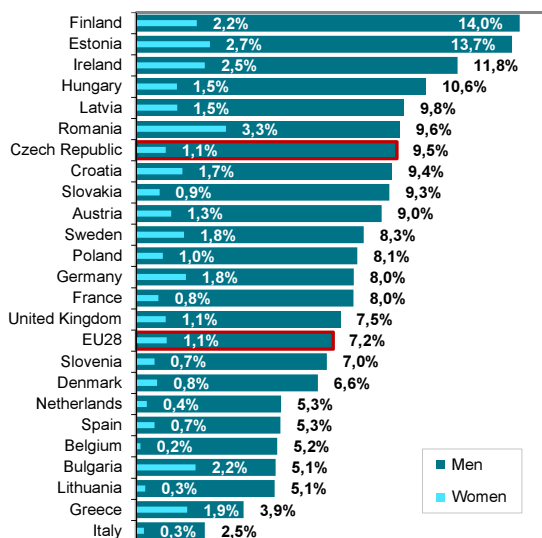


Figure A42 Bachelor programmes graduates* of ICT; 2016 (as % of all graduates in bachelor programmes)



* ISCED level 6

A ICT specialists

Figure A43 Master programmes graduates* of ICT field of education*; 2016 (Thousand persons)

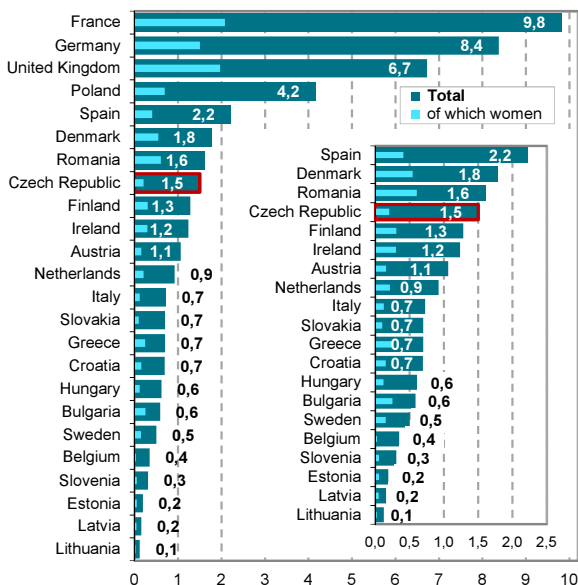
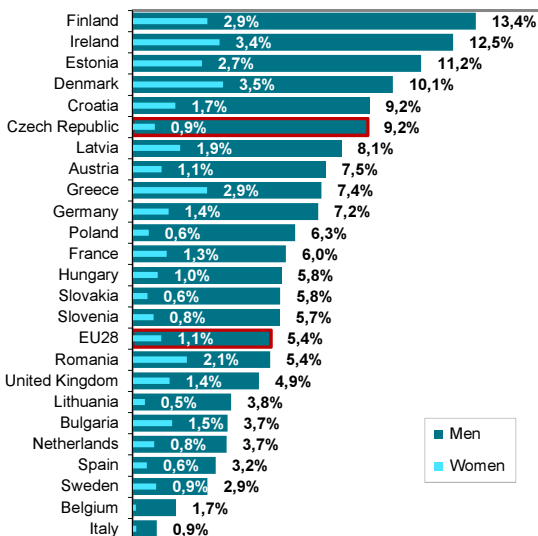


Figure A44 Master programmes graduates* of ICT; 2016 (as a percentage of all graduates in master programmes)



* ISCED level 7