

D ICT research and development

ICT R&D expenditure

This sub-chapter presents data on financial resources devoted in research and development of ICT equipment and software (hereafter **ICT R&D expenditure**) regardless of the main economic activity and sector of R&D performers. ICT is **classified** here into two main categories according to the groups of the **Classification of Products by Activity (CZ-CPA)** as follows:

- **ICT equipment includes:** 26.1 Electronic components and boards; 26.2 Computers and peripheral equipment; 26.3 Communication equipment; 26.4 Consumer electronics and 26.8 Magnetic and optical media.
- **Software includes:** 58.2 Software publishing; 61 Telecommunications services; 62 Computer programming, consultancy & related services and 63.1 Data processing, hosting & related services; web portals.

Detail description of **CZ-CPA** is available here (*only in Czech*): <https://www.czso.cz/csu/czso/klasifikace-produkce-cz-cpa>

Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.

Note: Software-related activities of a routine nature which do not involve scientific and/or technological advances or resolution of technological uncertainties are not to be considered R&D. For more information see Frascati Manual (OECD, Paris 2015) at: <http://oe.cd/frascati>

Data in this sub-chapter are based on the results of the **special module** on R&D expenditures in selected **technological areas** that is included in the Czech annual questionnaire on R&D. ICT R&D expenditure figures are **available** by sectors of R&D performance and industry (CZ-NACE) classification. **International comparison is not available** for this data set.

R&D expenditures and personnel in the ICT sector industries

This sub-chapter focuses on R&D expenditures and R&D personnel in enterprises with the main economic activity that belongs to the **ICT sector**. In general, the term ICT sector includes both: **ICT manufacturing** and **ICT services** which are associated with the production and/or distribution of information and communication technologies (ICT) and a provision of related services.

Industries of ICT sector includes all enterprises with the prevailing economic activity according to the codes of the Classification of Economic Activities (**CZ-NACE**) that fulfill the OECD official definition of ICT sector. For more information, see **Chapter G** or **dedicated website** to the measurement of **information economy industries** (*only in Czech*): <https://www.czso.cz/csu/czso/odvetvi-informacni-ekonomiky>

Data for the **international comparisons** come from the **Eurostat database** and refer to the reported or nearest available year.

Note: Data on R&D expenditures in the ICT sector has less predictive value than the figures for the total ICT R&D expenditures included in first sub-chapter. Enterprises within the ICT sector can perform their R&D activities in areas other than ICT and vice versa enterprises outside the ICT sector can exercise their R&D activities in the ICT field.

The both data sets on ICT R&D expenditures come from the results of the **Annual questionnaire on R&D**. For more information, see (*only in Czech*): https://www.czso.cz/csu/czso/vysledky_vyzkumu_a_vyvoje

D ICT research and development

Table D1 ICT R&D expenditures in Czechia

CZK million

	2017	2018	2019
Total	15 448	18 720	20 474
financed from government funds	1 452	1 924	1 920
Type of ICT product			
ICT equipment	5 024	5 594	5 791
Software	10 424	13 125	14 683
Type of R&D performer			
Enterprises, total	14 330	17 101	18 830
National enterprises	4 510	5 203	5 915
Foreign-controlled enterprises	9 820	11 898	12 914
Public universities	1 060	1 535	1 577
Other R&D performers	58	84	68

Figure D1 ICT R&D expenditures

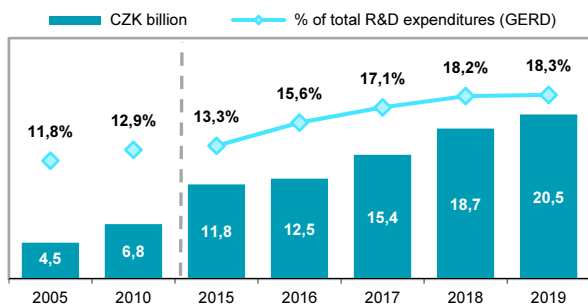


Figure D2 ICT R&D expenditures, by type of product

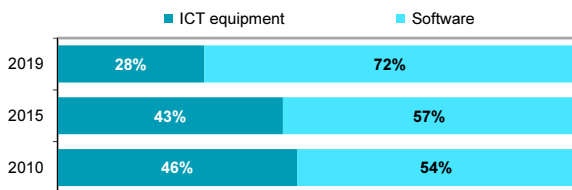
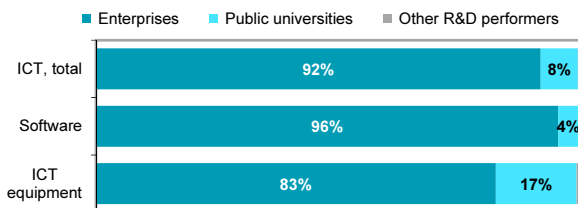


Figure D3 ICT R&D expenditures, by type of performer; 2019



Source: CZSO, Annual R&D survey

D ICT research and development

Table D2 Software R&D expenditures in Czechia

CZK million

	2017	2018	2019
Total	10 424	13 125	14 683
financed from government funds	489	751	652
Type of R&D performer			
Enterprises, total	10 029	12 464	14 041
National enterprises	2 899	3 597	4 302
Foreign-controlled enterprises	7 130	8 867	9 739
Public universities	367	630	609
Other R&D performers	27	32	33

Figure D4 Software R&D expenditures

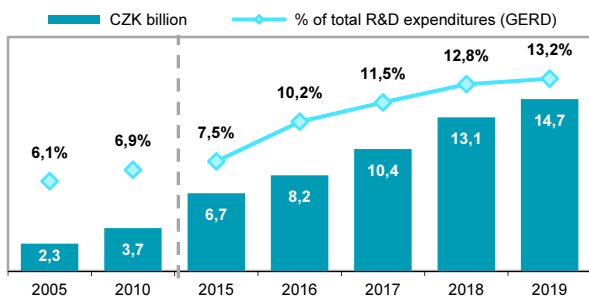


Figure D5 Software R&D expenditures, by performer; 2019

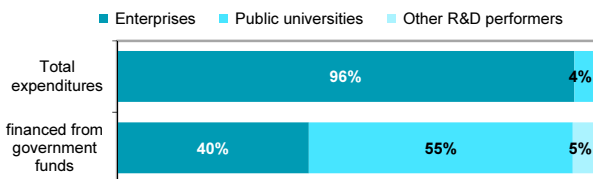
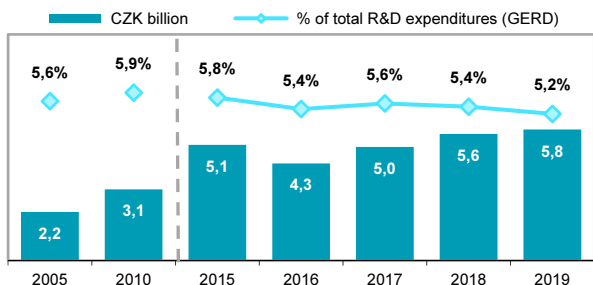


Figure D6 ICT equipment R&D expenditures



Source: CZSO, Annual R&D survey

D ICT research and development

Table D3 Business ICT R&D expenditures in Czechia

CZK million

	2017	2018	2019
Total	14 330	17 101	18 830
financed from government funds	646	861	784
Type of ICT product			
ICT equipment	4 301	4 637	4 789
Software	10 029	12 464	14 041
Enterprise size group			
Small (0-49 employees)	1 480	1 674	1 968
Medium (50-249 employees)	3 899	3 677	3 845
Large (250+ employees)	8 952	11 749	13 017
Ownership of enterprises			
National enterprises	4 510	5 203	5 915
Foreign-controlled enterprises	9 820	11 898	12 914
Industry of enterprises (CZ-NACE)			
ICT sector industries, total	10 035	12 644	13 286
ICT manufacturing	245	295	335
Telecommunications	724	794	366
IT services	9 066	11 555	12 585
Other industries	4 296	4 457	5 544

Figure D7 Business ICT R&D expenditures

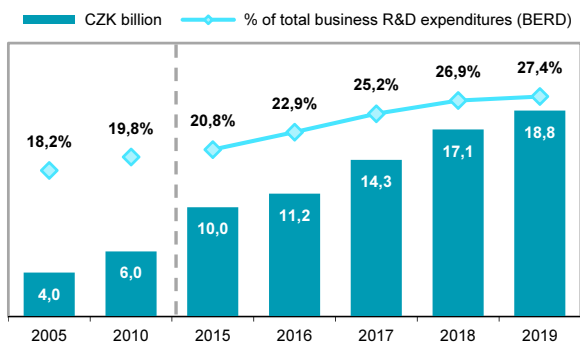
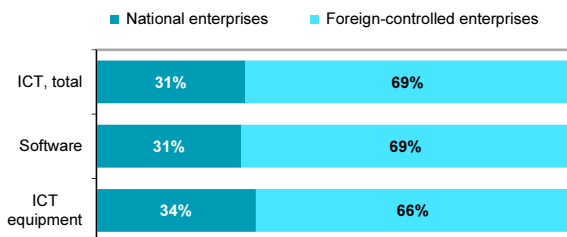


Figure D8 Business ICT R&D expenditures, by ownership; 2019



Source: CZSO, Annual R&D survey

D ICT research and development

Table D4 Business ICT R&D expenditures in Czechia; 2019

CZK million

	Total	ICT equipment	Software
Total	18 830	4 789	14 041
financed from government funds	784	522	262
Enterprise size group			
Small (0-49 employees)	1 968	430	1 538
Medium (50-249 employees)	3 845	856	2 989
Large (250+ employees)	13 017	3 504	9 513
Ownership of enterprises			
National enterprises	5 915	1 614	4 302
Foreign-controlled enterprises	12 914	3 176	9 739
Industry of enterprises (CZ-NACE)		0	
ICT sector industries, total	13 286	1 417	11 869
ICT manufacturing	335	215	120
Telecommunications	366	7	359
IT services	12 585	1 195	11 390
Other industries	5 544	3 372	2 171

Figure D9 Business ICT R&D expenditures, by type of product

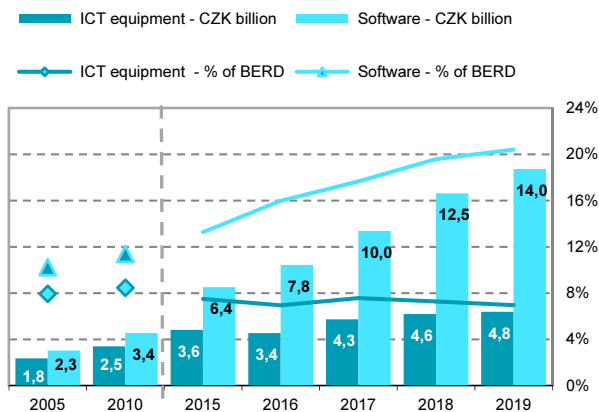
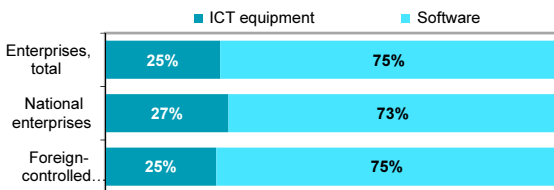


Figure D10 Business ICT R&D expenditures, by ownership of R&D performers and type of product; 2019



Source: CZSO, Annual R&D survey

D ICT research and development

Table D5 R&D expenditures in the ICT sector in Czechia

CZK million

	2017	2018	2019
Total	11 190	13 495	14 600
financed from government funds	889	1 067	983
Type of product			
ICT equipment	1 712	1 802	1 417
Software	8 322	10 842	11 869
Other non ICT related products	1 155	851	1 313
Enterprise size group			
Small (0-49 employees)	1 439	1 568	1 933
Medium (50-249 employees)	3 768	3 187	3 441
Large (250+ employees)	5 982	8 740	9 225
Ownership of enterprises			
National enterprises	3 800	4 306	4 830
Foreign-controlled enterprises	7 390	9 189	9 770
Industry of enterprises (ICT sub-sectors)			
ICT manufacturing	512	591	902
ICT services, total	10 677	12 903	13 698
Telecommunications	727	801	377
Computer programming	8 017	10 052	10 378
Data processing and hosting	1 252	1 101	1 066
Other IT services	682	949	1 877

Figure D11 R&D expenditures in the ICT sector

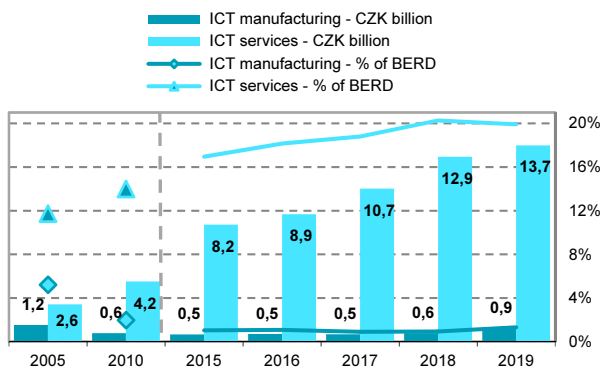
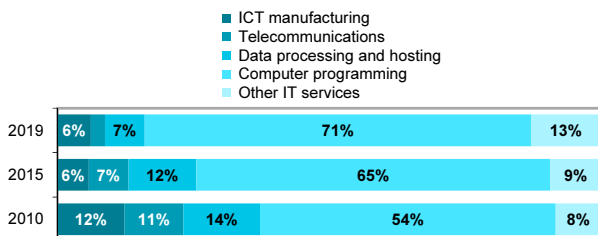


Figure D12 R&D expenditures in the ICT sector, by industry



Source: CZSO, Annual R&D survey

D ICT research and development

Figure D13 R&D expenditures in the ICT sector; 2018
(% of GDP)

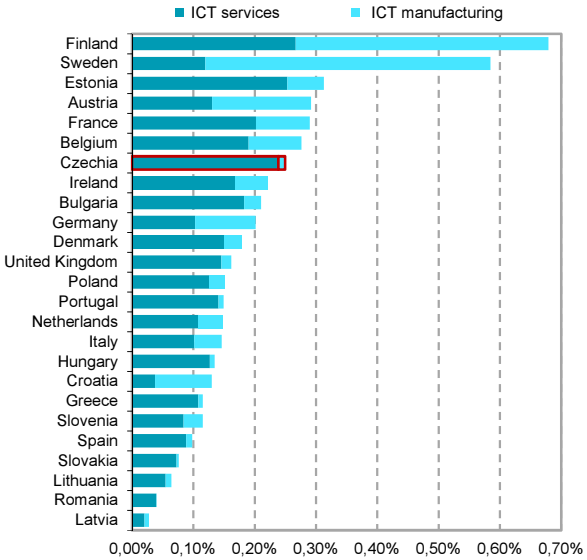
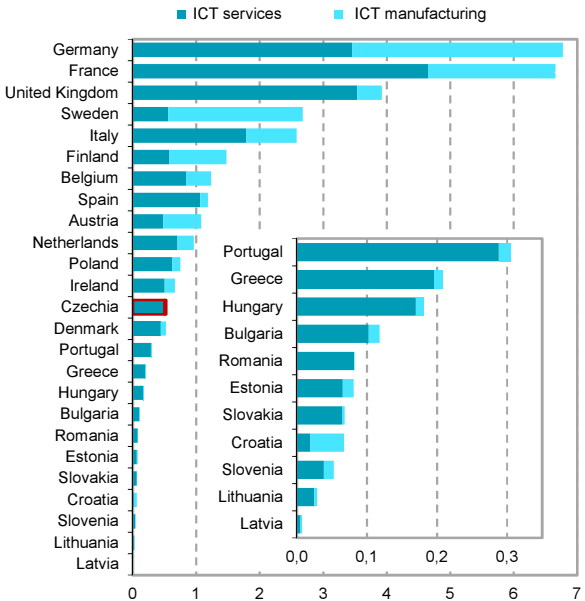


Figure D14 R&D expenditures in the ICT sector; 2018
(EUR billion)



Source: CZSO calculations based on Eurostat data

D ICT research and development

Table D6 R&D personnel in the ICT sector in Czechia

R&D personnel (Full Time Equivalent Numbers - FTE)

	2017	2018	2019
Total	9 130	10 196	11 102
Man	1 084	1 141	1 363
Woman	8 046	9 055	9 739
Enterprise size group			
Small (0-49 employees)	1 709	1 857	2 078
Medium (50-249 employees)	3 214	2 891	2 998
Large (250+ employees)	4 207	5 449	6 026
Ownership of enterprises			
National enterprises	4 094	4 428	4 815
Foreign-controlled enterprises	5 037	5 768	6 287
Industry of enterprises (ICT sub-sectors)			
ICT manufacturing	553	623	818
ICT services, total	8 578	9 573	10 284
Telecommunications	234	352	248
Computer programming	6 629	7 489	7 788
Data processing and hosting	967	852	866
Other IT services	746	880	1 382

Figure D15 R&D personnel in the ICT sector

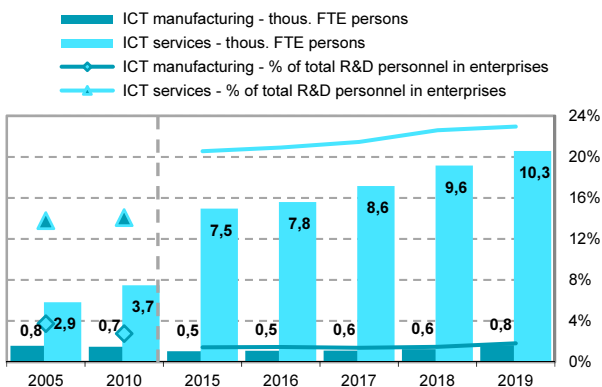
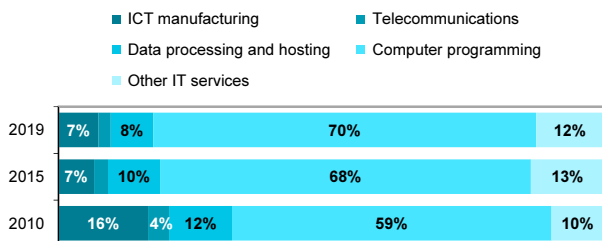


Figure D16 R&D personnel in the ICT sector, by industry



Source: CZSO, Annual R&D survey