

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>

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Table D1 Total ICT R&D expenditures in Czechia

	CZK million		
	2020	2021	2022
Total	22 975	27 450	31 643
financed from government funds	1 828	1 979	1 668
Type of ICT product			
ICT equipment	6 691	7 372	8 164
Software	16 284	20 078	23 479
Type of R&D performer			
Enterprises, total	21 517	26 096	30 469
National enterprises	6 799	8 607	9 822
Foreign-controlled enterprises	14 718	17 489	20 647
Public universities	1 355	1 267	1 049
Other R&D performers	103	86	126

Figure D1 Total ICT R&D expenditures

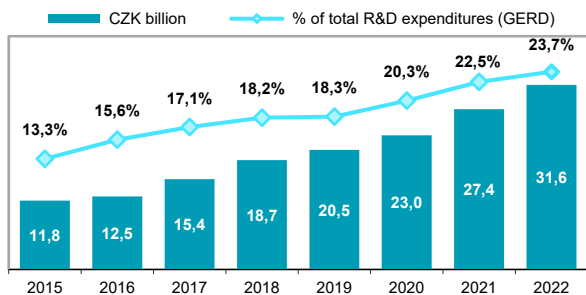


Figure D2 ICT R&D expenditures, by type of product

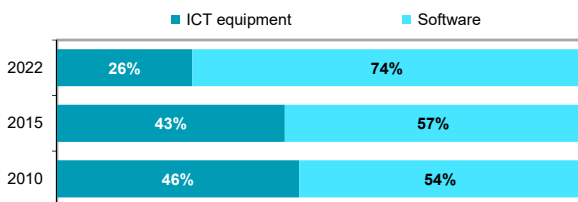
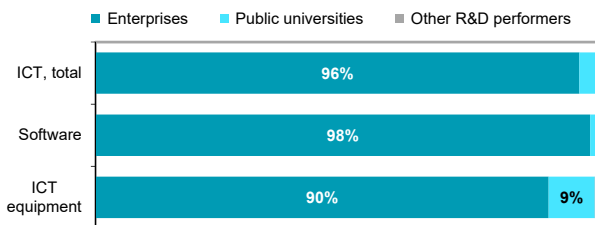


Figure D3 ICT R&D expenditures, by type of performer; 2021



Source: CZSO, Annual R&D survey

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Table D2 Software R&D expenditures in Czechia

	CZK million		
	2020	2021	2022
Total	16 284	20 078	23 479
financed from government funds	573	611	581
Type of R&D performer			
Enterprises, total	15 792	19 699	23 108
National enterprises	4 679	6 246	7 331
Foreign-controlled enterprises	11 112	13 453	15 777
Public universities	452	342	298
Other R&D performers	40	37	73

Figure D4 Software R&D expenditures

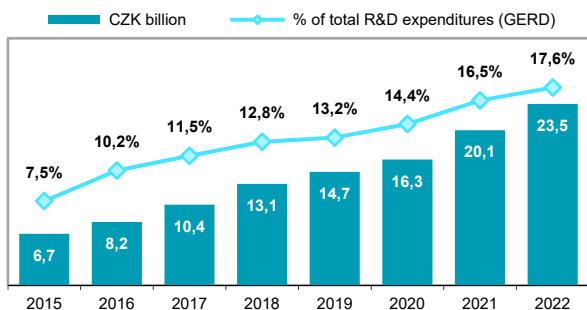


Figure D5 Software R&D expenditures, by performer; 2021

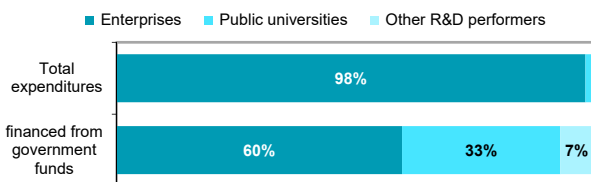
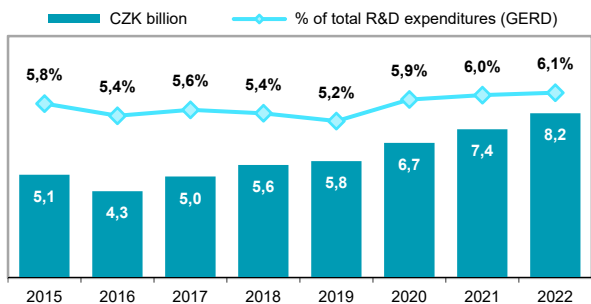


Figure D6 ICT equipment R&D expenditures



Source: CZSO, Annual R&D survey

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Table D3 ICT R&D expenditures in enterprises in Czechia

	CZK million		
	2020	2021	2022
Total	21 517	26 096	30 469
financed from government funds	900	945	849
Type of ICT product			
ICT equipment	5 725	6 397	7 361
Software	15 792	19 699	23 108
Size group (employees)			
Small enterprises (0-49)	2 154	2 582	3 436
Medium enterprises (50-249)	3 957	4 938	4 819
Large enterprises (250+)	15 406	18 576	22 214
Ownership			
National enterprises	6 799	8 607	9 822
Foreign-controlled enterprises	14 718	17 489	20 647
Industry (CZ-NACE)			
ICT sector industries, total	15 262	18 906	21 895
ICT manufacturing	323	374	484
ICT services	14 939	18 533	21 412
Other industries	6 255	7 190	8 574

Figure D7 ICT R&D expenditures in enterprises

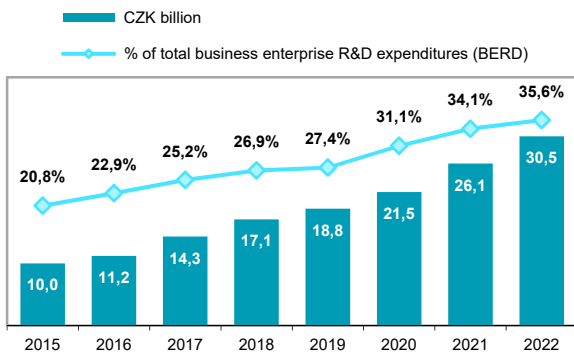
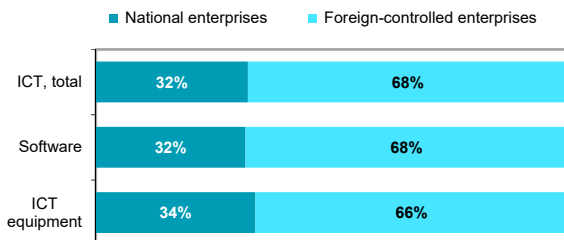


Figure D8 ICT R&D expenditures in enterprises, by ownership; 2022



Source: CZSO, Annual R&D survey

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Table D4 ICT R&D expenditures in enterprises in Czechia by type of product; 2022

CZK million

	Total	ICT equipment	Software
Total	30 469	7 361	23 108
financed from government funds	945	600	345
Size group (employees)			
Small enterprises (0-49)	3 436	806	2 630
Medium enterprises (50-249)	4 819	1 344	3 475
Large enterprises (250+)	22 214	5 212	17 002
Ownership			
National enterprises	9 822	2 491	7 331
Foreign-controlled enterprises	20 647	4 871	15 777
Industry (CZ-NACE)			
ICT sector industries, total	21 895	1 789	20 107
ICT manufacturing	484	289	195
ICT services	21 412	1 500	19 912
Other industries	8 574	5 573	3 001

Figure D9 ICT R&D expenditures in enterprises, by product

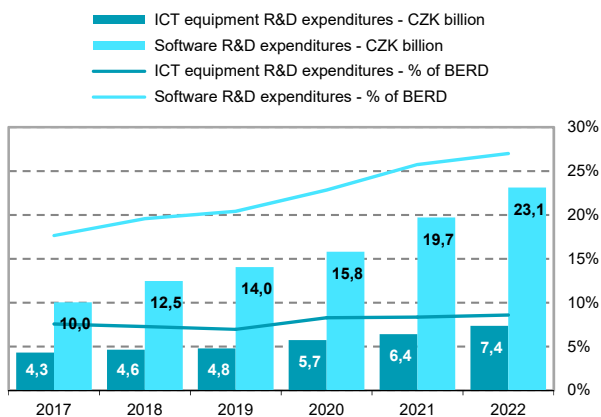
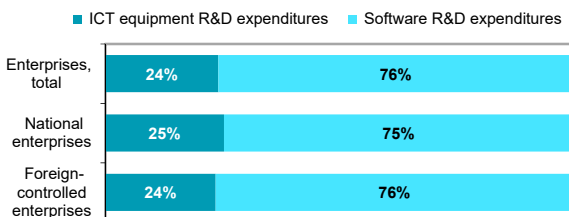


Figure D10 ICT R&D expenditures in enterprises, by ownership of R&D performers; 2022



Source: CZSO, Annual R&D survey

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

CZK million

	2020	2021	2022
Total	16 739	20 190	23 035
financed from government funds	1 071	1 715	1 777
Type of product			
ICT equipment	1 652	1 837	1 789
Software	13 610	17 069	20 107
Other non ICT related products	1 477	1 284	1 140
Size group (employees)			
Small enterprises (0-49)	2 031	2 332	2 918
Medium enterprises (50-249)	3 329	4 230	3 959
Large enterprises (250+)	11 379	13 628	16 159
Ownership			
National enterprises	5 454	6 851	8 134
Foreign-controlled enterprises	11 285	13 339	14 901
ICT sub-sectors			
ICT manufacturing	999	727	1 054
ICT services, total	15 740	19 463	21 982
Computer programming	11 867	15 005	17 056
Data processing and Other IT services	3 874	4 458	4 926

Figure D11 R&D expenditures in the ICT sector

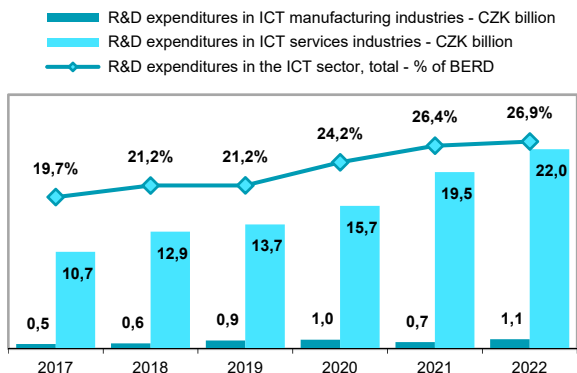
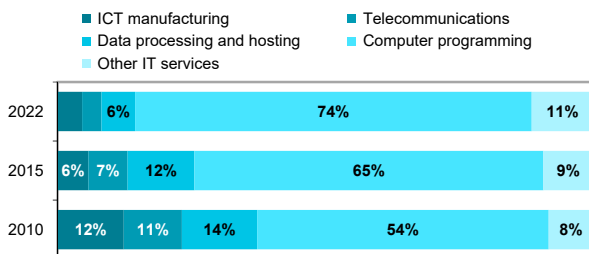


Figure D12 R&D expenditures in the ICT sector, by industry



Source: CZSO, Annual R&D survey

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Figure D13 R&D expenditures in the ICT sector; 2021
(% of GDP)

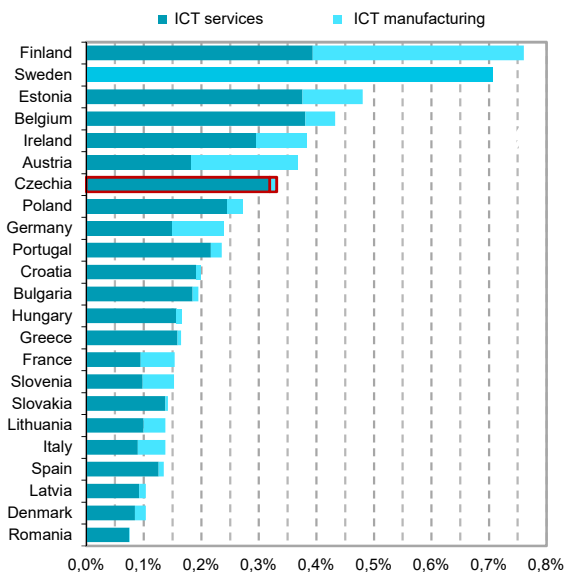
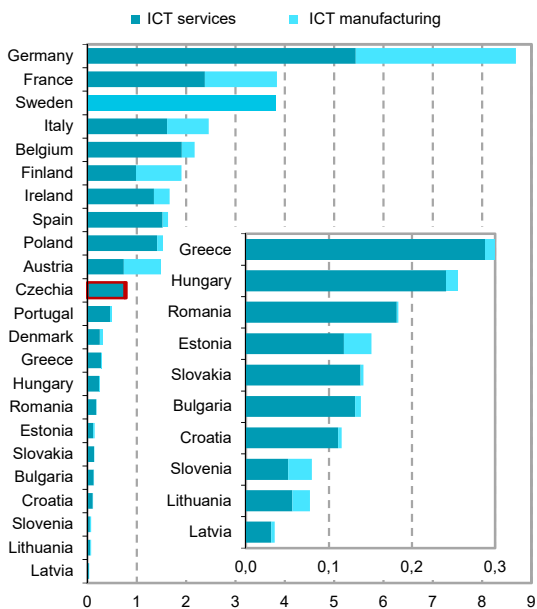


Figure D14 R&D expenditures in the ICT sector; 2021
(EUR billion)



Source: CZSO calculations based on Eurostat data

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

	Full Time Equivalent Numbers		
	2020	2021	2022
Total	11 593	12 971	14 132
Men	10 130	11 106	11 911
Women	1 462	1 866	2 221
Size group (employees)			
Small enterprises (0-49)	2 021	2 225	2 588
Medium enterprises (50-249)	2 838	3 093	2 779
Large enterprises (250+)	6 734	7 653	8 765
Ownership			
National enterprises	6 656	7 591	8 062
Foreign-controlled enterprises	4 937	5 380	6 070
ICT sub-sectors			
ICT manufacturing	832	761	857
ICT services, total	10 760	12 210	13 276
Computer programming	8 493	9 858	10 879
Data processing and Other IT services	2 268	2 352	2 397

Figure D15 R&D personnel in the ICT sector

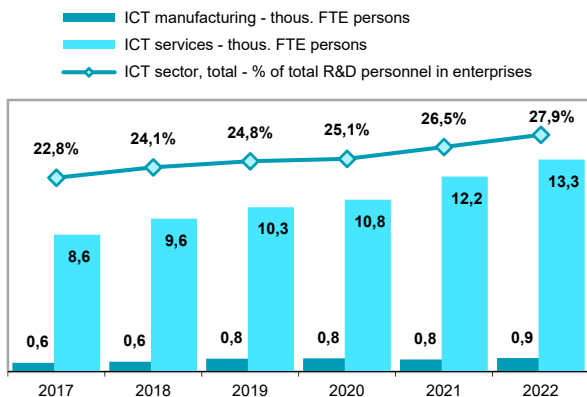
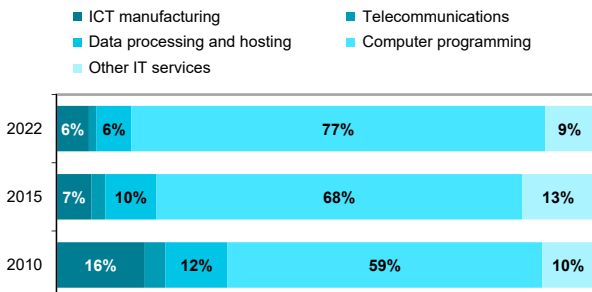


Figure D16 R&D personnel in the ICT sector, by industry



Source: CZSO, Annual R&D survey