

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		
	2019	2020	2021
Total	20 474	22 975	27 450
financed from government funds	1 920	1 828	1 979
Type of ICT product			
ICT equipment	5 791	6 691	7 372
Software	14 683	16 284	20 078
Type of R&D performer			
Enterprises, total	18 830	21 517	26 096
National enterprises	5 915	6 799	8 607
Foreign-controlled enterprises	12 914	14 718	17 489
Public universities	1 576	1 351	1 265
Other R&D performers	68	107	89

Figure D1 Total ICT R&D expenditures

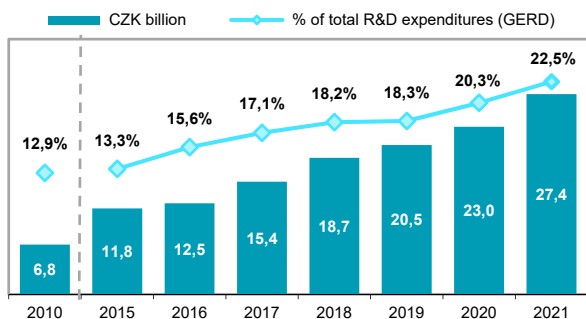


Figure D2 ICT R&D expenditures, by type of product

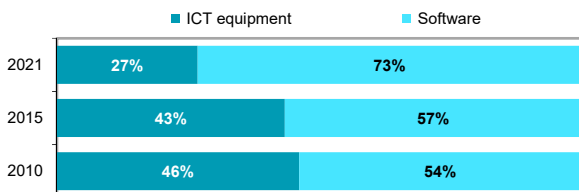
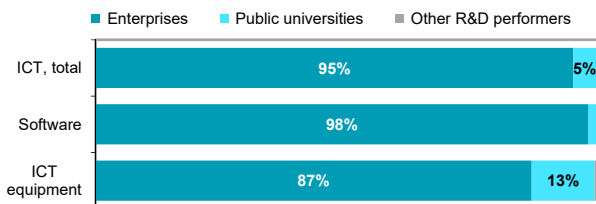


Figure D3 ICT R&D expenditures, by type of performer; 2021



Source: CZSO, Annual R&D survey

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Table D2 Software R&D expenditures in Czechia

	CZK million		
	2019	2020	2021
Total	14 683	16 284	20 078
financed from government funds	652	573	611
Type of R&D performer			
Enterprises, total	14 041	15 792	19 699
National enterprises	4 302	4 679	6 246
Foreign-controlled enterprises	9 739	11 112	13 453
Public universities	609	448	340
Other R&D performers	33	44	39

Figure D4 Software R&D expenditures

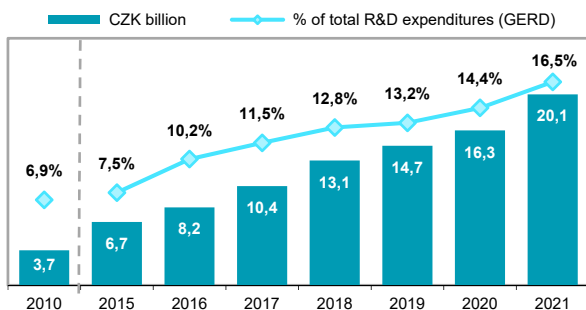


Figure D5 Software R&D expenditures, by performer; 2021

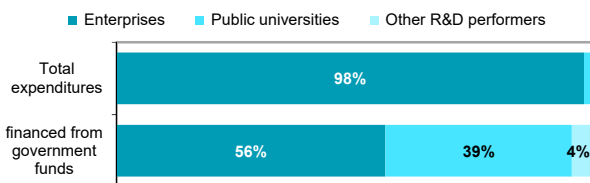
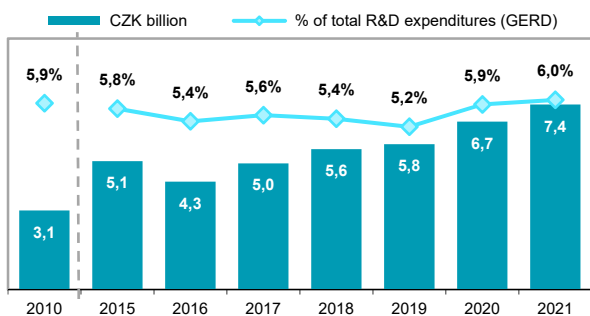


Figure D6 ICT equipment R&D expenditures



Source: CZSO, Annual R&D survey

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Table D3 ICT R&D expenditures in enterprises in Czechia

	CZK million		
	2019	2020	2021
Total	18 830	21 517	26 096
financed from government funds	784	900	945
Type of ICT product			
ICT equipment	4 789	5 725	6 397
Software	14 041	15 792	19 699
Size group (employees)			
Small enterprises (0-49)	1 968	2 154	2 582
Medium enterprises (50-249)	3 845	3 957	4 938
Large enterprises (250+)	13 017	15 406	18 576
Ownership			
National enterprises	5 915	6 799	8 607
Foreign-controlled enterprises	12 914	14 718	17 489
Industry (CZ-NACE)			
ICT sector industries, total	13 286	15 262	18 906
ICT manufacturing	335	323	374
Telecommunications	366	971	769
IT services	12 585	12 585	12 585
Other industries	5 544	6 255	7 190

Figure D7 ICT R&D expenditures in enterprises

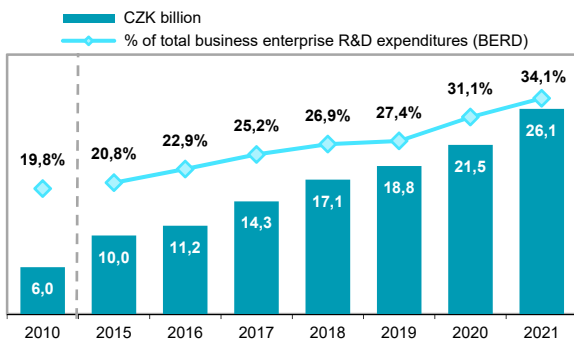
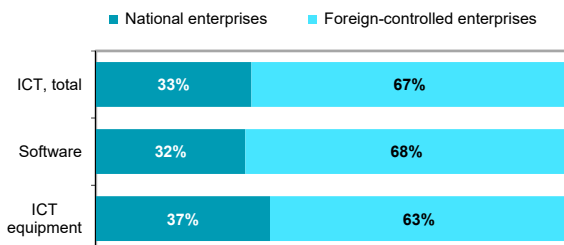


Figure D8 ICT R&D expenditures in enterprises, by ownership; 2021



Source: CZSO, Annual R&D survey

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Table D4 ICT R&D expenditures in enterprises in Czechia by type of product; 2021

CZK million

	Total	ICT equipment	Software
Total	26 096	6 397	19 699
financed from government funds	945	600	345
Size group (employees)			
Small enterprises (0-49)	2 582	686	1 896
Medium enterprises (50-249)	4 938	1 156	3 782
Large enterprises (250+)	18 576	4 555	14 021
Ownership			
National enterprises	8 607	2 361	6 246
Foreign-controlled enterprises	17 489	4 036	13 453
Industry (CZ-NACE)			
ICT sector industries, total	15 262	1 652	13 610
ICT manufacturing	374	230	144
Telecommunications	769	8	760
IT services	17 764	1 599	16 165
Other industries	10 834	4 745	6 089

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

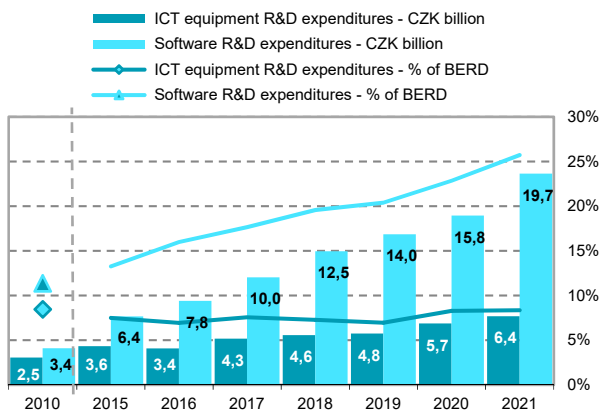
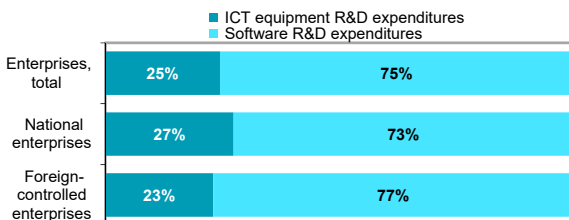


Figure D10 ICT R&D expenditures in enterprises, by ownership of R&D performers; 2021



Source: CZSO, Annual R&D survey

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

CZK million

	2019	2020	2021
Total	14 600	16 739	20 190
financed from government funds	983	1 071	1 715
Type of product			
ICT equipment	1 417	1 652	1 837
Software	11 869	13 610	17 069
Other non ICT related products	1 313	1 477	1 284
Size group (employees)			
Small enterprises (0-49)	1 933	2 031	2 332
Medium enterprises (50-249)	3 441	3 329	4 230
Large enterprises (250+)	9 225	11 379	13 628
Ownership			
National enterprises	4 830	5 454	6 851
Foreign-controlled enterprises	9 770	11 285	13 339
ICT sub-sectors			
ICT manufacturing	902	999	727
ICT services, total	13 698	15 740	19 463
Telecommunications	377	983	780
Computer programming	10 378	11 867	15 005
Data processing and hosting	1 066	1 236	1 706
Other IT services	1 877	1 655	1 972

Figure D11 R&D expenditures in the ICT sector

- R&D expenditures in ICT manufacturing industries - CZK billion
- R&D expenditures in ICT services industries - CZK billion
- ◆ R&D expenditures in the ICT sector, total - % of BERD

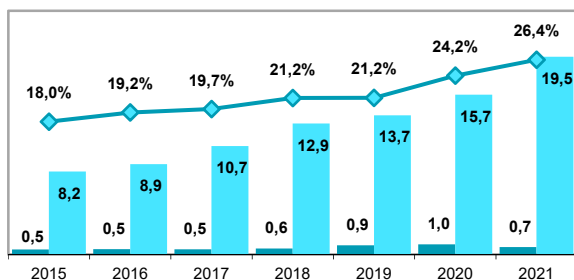
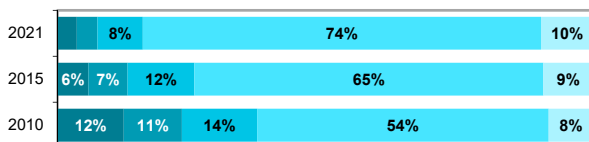


Figure D12 R&D expenditures in the ICT sector, by industry

- ICT manufacturing
- Telecommunications
- Data processing and hosting
- Computer programming
- Other IT services



Source: CZSO, Annual R&D survey

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Figure D13 R&D expenditures in the ICT sector; 2020
(% of GDP)

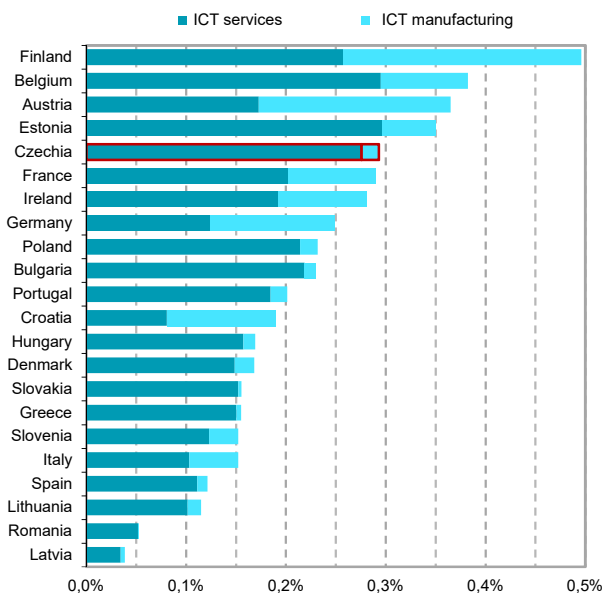
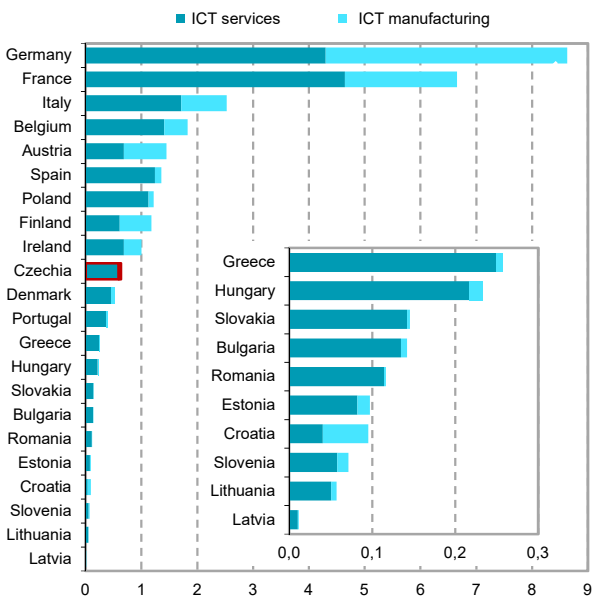


Figure D14 R&D expenditures in the ICT sector; 2020
(EUR billion)



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		
	2019	2020	2021
Total	11 102	11 593	12 971
Men	9 739	10 130	11 106
Women	1 363	1 462	1 866
Size group (employees)			
Small enterprises (0-49)	2 078	2 021	2 225
Medium enterprises (50-249)	2 998	2 838	3 093
Large enterprises (250+)	6 026	6 734	7 653
Ownership			
National enterprises	4 815	4 937	5 380
Foreign-controlled enterprises	6 287	6 656	7 591
ICT sub-sectors			
ICT manufacturing	818	832	761
ICT services, total	10 284	10 760	12 210
Telecommunications	248	223	202
Computer programming	7 788	8 493	9 858
Data processing and hosting	866	1 010	1 013
Other IT services	1 382	1 034	1 137

Figure D15 R&D personnel in the ICT sector

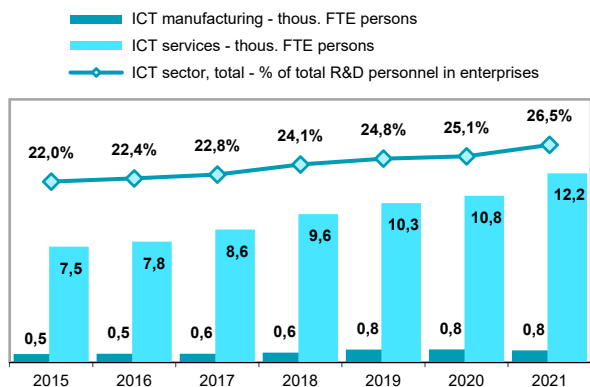
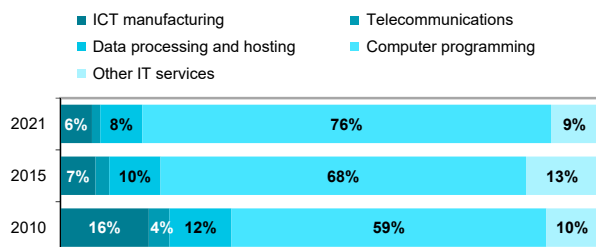


Figure D16 R&D personnel in the ICT sector, by industry



Source: CZSO, Annual R&D survey