

## C Science in ICT

This chapter includes data about **R&D expenditures** into ICT equipment and software and data about **patents** granted in the field of ICT.

**Research and development (R&D)** is a systematic creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of human beings, culture and society.

**R&D expenditures** includes all current (wage and other) and capital expenditures determined for R&D performed in observed institutions on the territory of a given country made during the reference year regardless the source of the funds.

Data about **ICT related R&D expenditures** are based on the results of the special module that is included in the Czech **Annual R&D survey**. Further information on the Czech R&D Survey can be found at:

[http://www.czso.cz/csu/2012edicniplan.nsf/engpubl/9601-12-eng\\_r\\_2012](http://www.czso.cz/csu/2012edicniplan.nsf/engpubl/9601-12-eng_r_2012)

**ICT products** for R&D expenditures are classified into two main categories based on the following CPA 2008 divisions and groups:

- **ICT equipment** that includes Electronic components and boards (26.1); Computers and peripheral equipment (26.2); Communication equipment (26.3) and Consumer electronics (26.4)
- **Software** that includes Computer programming, consultancy and related services (62)

*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 included in R&D.*

**Patent statistics** brings information about results and success of research, development and innovation activities in selected areas of technology.

A **patent** is a public deed issued by the relevant patent office, which provides legal protection to an invention for the period of up to 20 years (provided that maintenance fees are paid), namely on the territory for which it was issued by the office. Patent protection on the territory of the Czech Republic is ensured by the **Industrial Property Office of the Czech Republic** (hereinafter only IPO CR).

Data in this chapter were processed by the Czech Statistical Office based on data sources of the IPO CR. Patent data are broken down according to the **Patent Manual of the OECD (OECD, Paris 2009)**. Based on the International Patent Classification (IPC) it is possible to classify ICT related patents into four main categories as follows:

- Telecommunications
- Consumer electronics
- Computers and peripheral equipment
- Other ICT

*Category 'other ICT' includes, compare to other chapters, invention in the field of ICT related medical and scientific equipment.*

The Czech Statistical Office publishes additional information about the **Czech applicants** broken down e.g. by their **institutional sector** (business enterprise sector, government sector, higher education sector, and natural persons) or by region of residence of the patent holder. Further information on the Czech patent statistics can be found at:

[http://www.czso.cz/csu/redakce.nsf/i/patentova\\_statistika](http://www.czso.cz/csu/redakce.nsf/i/patentova_statistika).

The following **OECD web site** was used as a data source for the international comparison: [www.oecd.org/sti/ipr-statistics](http://www.oecd.org/sti/ipr-statistics).

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**Table C1 Total R&D expenditure in ICT in the Czech Republic**

CZK million

	2009	2010	2011
<b>Total</b>	<b>6 630</b>	<b>6 811</b>	<b>7 626</b>
ICT equipment	3 327	3 147	3 951
Software	3 303	3 664	3 675
<b>Sector of R&amp;D performance</b>			
Business enterprise	5 801	5 956	6 607
Government	209	180	204
Higher education	603	667	749
Private non-profit	17	9	66

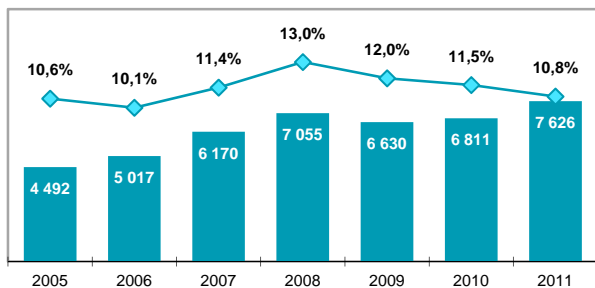
**Table C2 R&D expenditure in ICT in the Czech Republic funded by government**

CZK million

	2009	2010	2011
<b>Total</b>	<b>1 384</b>	<b>1 282</b>	<b>1 508</b>
ICT equipment	1 041	947	1 117
Software	343	335	391
<b>Sector of R&amp;D performance</b>			
Business enterprise	716	554	676
Government	184	162	187
Higher education	480	561	643
Private non-profit	4	5	3

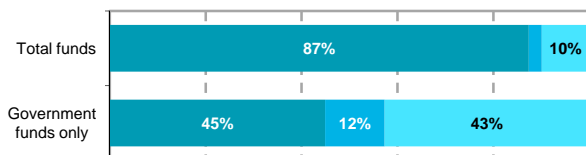
**Figure C1 R&D expenditure in ICT equipment and software**

■ CZK million    ◆ as percentage of total R&D expenditure (GERD)



**Figure C2 R&D expenditure in ICT by sector of performance and source of funds, 2011**

■ Business enterprise    ■ Government    ■ Higher education



Source: CZSO, Annual R&D survey

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**Table C3 Total software R&D expenditure in the CR**

CZK million

	2009	2010	2011
<b>Total</b>	<b>3 303</b>	<b>3 664</b>	<b>3 675</b>
<b>Sector of R&amp;D performance</b>			
Business enterprise	3 105	3 415	3 382
Government	12	13	6
Higher education	174	235	282
Private non-profit	11	1	6

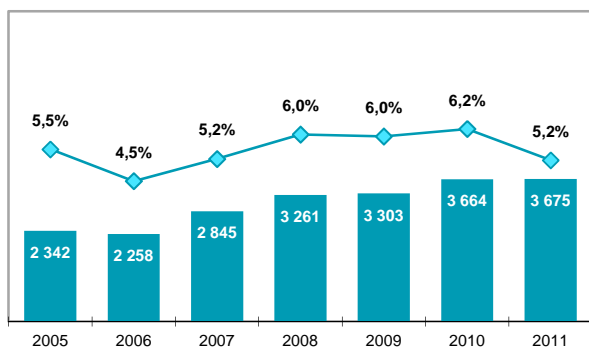
**Table C4 Software R&D expenditure in the Czech Republic funded by government**

CZK million

	2009	2010	2011
<b>Total</b>	<b>343</b>	<b>335</b>	<b>391</b>
<b>Sector of R&amp;D performance</b>			
Business enterprise	205	137	143
Government	9	11	6
Higher education	125	187	242
Private non-profit	3	1	1

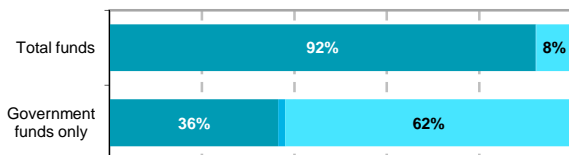
**Figure C3 Software R&D expenditure**

■ CZK million    ◆ as percentage of total R&D expenditure (GERD)



**Figure C4 Software R&D expenditure by sector of performance and source of funds, 2011**

■ Business enterprise    ■ Government    ■ Higher education



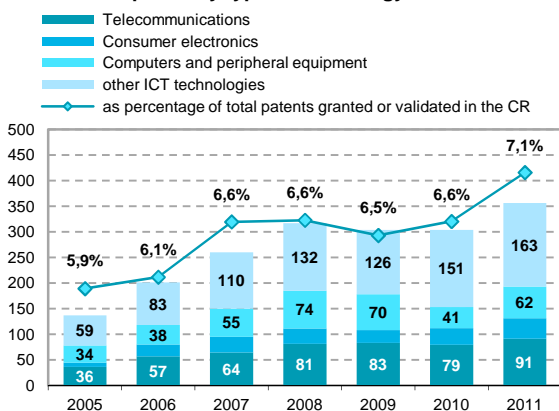
Source: CZSO, Annual R&D survey

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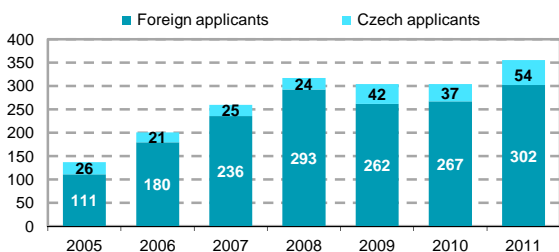
**Table C5 ICT patents granted or validated in the CR**

	number		
	2009	2010	2011
<b>Total</b>	<b>304</b>	<b>304</b>	<b>356</b>
Telecommunications	83	79	91
Consumer electronics	25	33	40
Computers and peripheral equipment	70	41	62
Other ICT technologies	126	151	163
<b>Country of the patent applicant</b>			
<b>Czech applicants</b>	<b>42</b>	<b>37</b>	<b>54</b>
Business enterprise	21	7	11
Government	2	3	8
Higher education	17	26	33
Private persons	2	1	3
<b>Foreign applicants</b>	<b>262</b>	<b>267</b>	<b>302</b>
Germany	88	72	76
United states	44	53	65
Czech Republic	42	37	54
Japan	17	17	27

**Figure C5 ICT patents granted or validated in the Czech Republic by type of technology**



**Figure C6 ICT patents granted or validated in the Czech Republic by applicant's nationality**



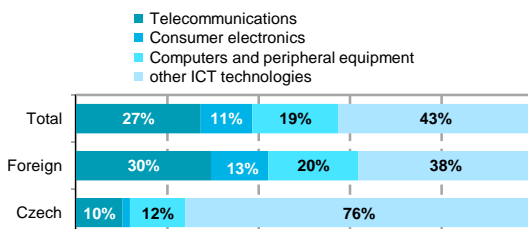
Source: IPO of the Czech Republic and CZSO calculations

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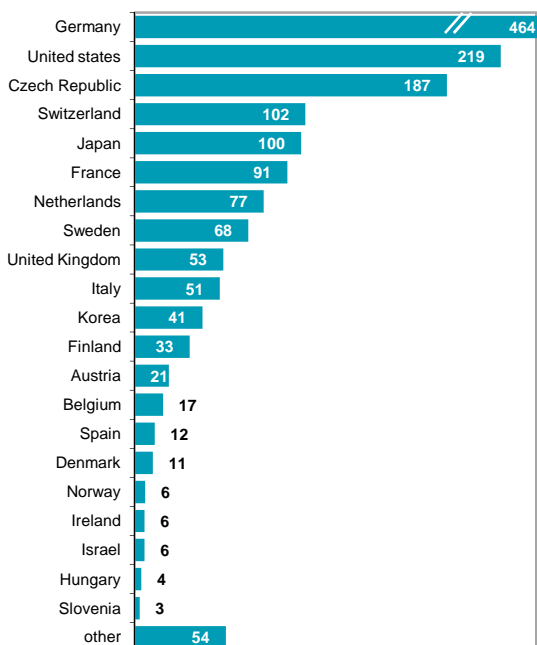
**Table C6 Valid ICT patents in the CR as of 31.12.2011**

	Total	Country of the patent applicant	
		Czech	Foreign
<b>Total</b>	<b>1 625</b>	<b>187</b>	<b>1 438</b>
Telecommunications	444	19	425
Consumer electronics	183	3	180
Computers and peripheral equipment	306	23	283
Other ICT technologies	692	142	550

**Figure C7 ICT patents valid in the CR as of 31.12.2011 by type of technology and applicant's nationality**

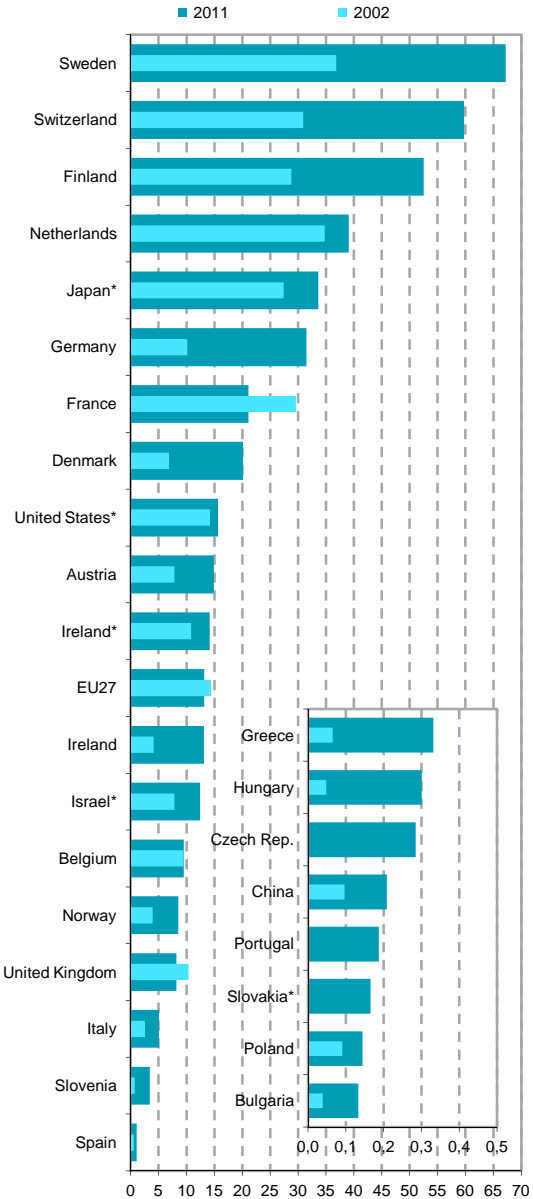


**Figure C8 ICT patents valid in the Czech Republic as of 31.12.2011 by applicant's nationality**



Source: IPO of the Czech Republic and CZSO calculations

Figure C9 ICT patents granted by the European Patent Office (per million inhabitants)



\* year 2010