Regional Seminar on the Patentability of Computer-Implemented Inventions

Computer-Implemented Inventions (CII): Opportunities and Challenges

WIPO in cooperation with the Estonian Patent Office

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OVERVIEW

- The software industry today and PCT filing statistics
- International legal framework of CII protection
- Main issues re. patentability of CII
- Arguments ‘for’ and ‘against’ protecting CII by patents

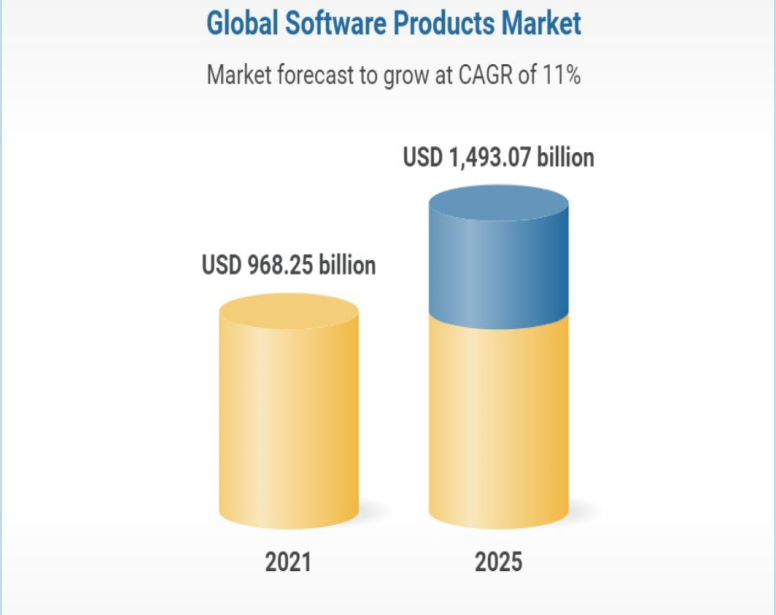
Development of software industry

- Software industry = strategic area for the future development
- How to facilitate innovation and growth in software industry?

- The global software products market was expected to grow from $930.93 billion in 2020 to $968.25 billion in 2021 at a compound annual growth rate (CAGR) of 4%. The market is expected to reach $1493.07 billion in 2025 at a CAGR of 11%.

- IoT technology adoption is expected to expand the demand for software products

Source: Software Products Global Market Report 2021: COVID-19 Impact and Recovery to 2030 - ResearchAndMarkets.com

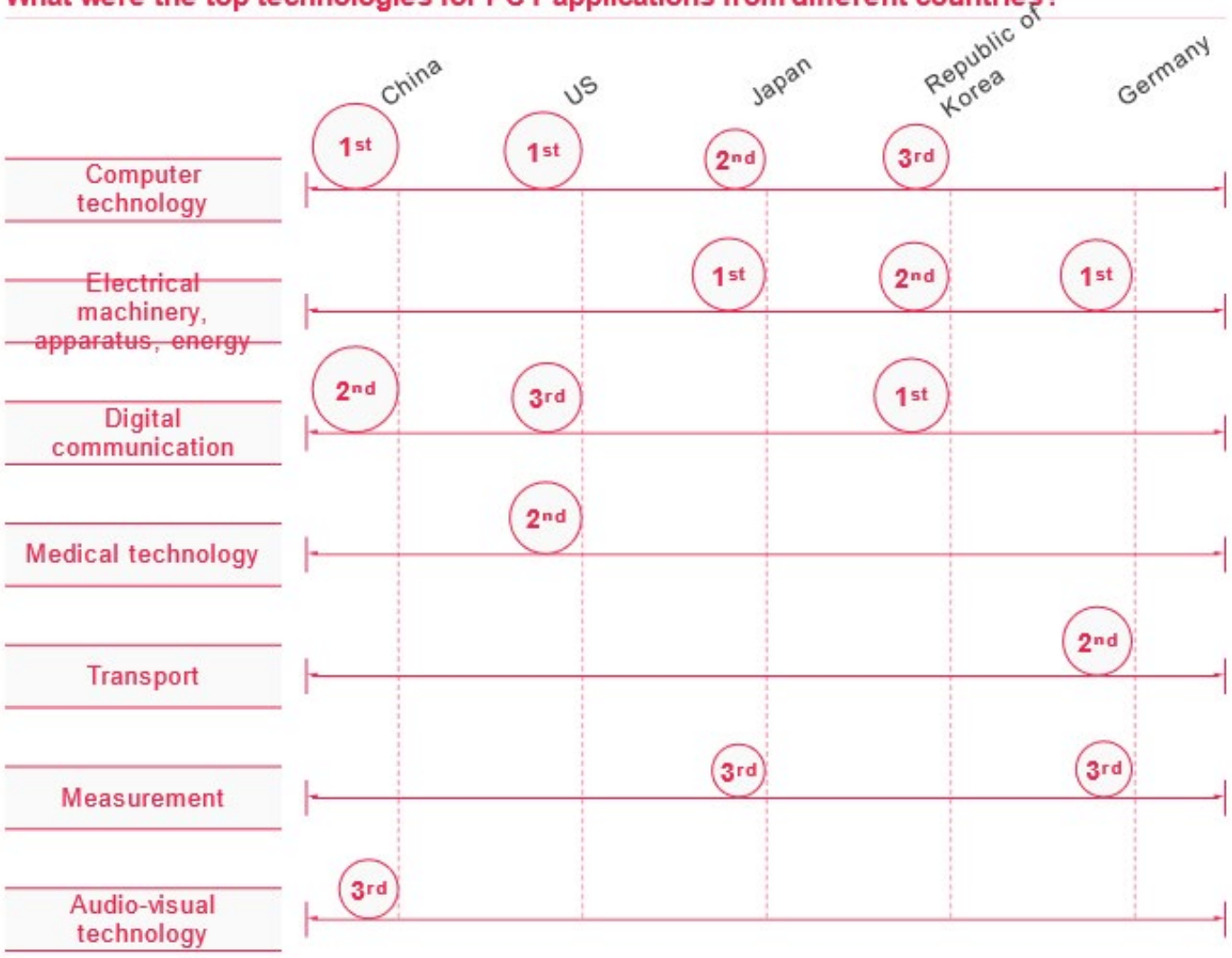


Statistics 2021: PCT International applications by field of technology

	Technical Field	2019	2020	2021	Share (%)	Growth (%)
I	**Electrical engineering**					
1	Electrical machinery, apparatus, energy	17,194	17,367	18,224	6.9	4.9
2	Audio-visual technology	8,900	11,534	10,837	4.1	-6.0
3	Telecommunications	5,861	6,445	6,371	2.4	-1.1
4	Digital communication	19,050	22,078	23,603	9.0	6.9
5	Basic communication processes	1,554	1,610	1,647	0.6	2.3
6	Computer technology	21,496	24,343	26,092	9.9	7.2
7	IT methods for management	5,747	5,891	5,298	2.0	-10.1
8	Semiconductors	8,048	8,862	8,346	3.2	-5.8
II	**Instruments**					
9	Optics	8,018	8,371	7,919	3.0	-5.4
10	Measurement	11,451	12,704	12,152	4.6	-4.3
11	Analysis of biological materials	1,917	2,062	2,149	0.8	4.2
12	Control	5,363	5,457	5,182	2.0	-5.0
13	Medical technology	16,916	17,500	18,552	7.1	6.0
III	**Chemistry**					
14	Organic fine chemistry	5,888	6,351	6,150	2.3	-3.2
15	Biotechnology	7,404	7,985	8,745	3.3	9.5
16	Pharmaceuticals	9,785	10,767	12,147	4.6	12.8
17	Macromolecular chemistry, polymers	4,425	4,656	4,478	1.7	-3.8
18	Food chemistry	2,214	2,384	2,467	0.9	3.5
19	Basic materials chemistry	5,589	5,712	5,482	2.1	-4.0
20	Materials, metallurgy	4,417	4,685	4,313	1.6	-7.9
21	Surface technology, coating	3,852	4,014	3,834	1.5	-4.5
22	Micro-structural and nano-technology	390	456	439	0.2	-3.7
23	Chemical engineering	5,074	5,285	5,225	2.0	-1.1
24	Environmental technology	2,705	3,020	2,769	1.1	-8.3
IV	**Mechanical engineering**					
25	Handling	5,954	6,413	6,256	2.4	-2.4
26	Machine tools	4,300	4,315	4,307	1.6	-0.2
27	Engines, pumps, turbines	5,366	5,123	4,441	1.7	-13.3
28	Textile and paper machines	2,769	2,952	2,622	1.0	-11.2
29	Other special machines	7,236	7,483	7,232	2.7	-3.4
30	Thermal processes and apparatus	4,085	4,306	3,926	1.5	-8.8
31	Mechanical elements	5,952	5,847	5,160	2.0	-11.7
32	Transport	11,227	11,290	10,110	3.8	-10.5
V	**Other fields**					
33	Furniture, games	4,625	4,718	4,491	1.7	-4.8
34	Other consumer goods	5,445	6,044	5,840	2.2	-3.4
35	Civil engineering	6,387	6,502	6,317	2.4	-2.8

ROPERTY

What were the top technologies for PCT applications from different countries?



Applicants from China and the US filed most heavily in computer technology. Japan and Germany filed mostly in electrical machinery and the Republic of Korea in digital communication.

Note: Based on published PCT applications.

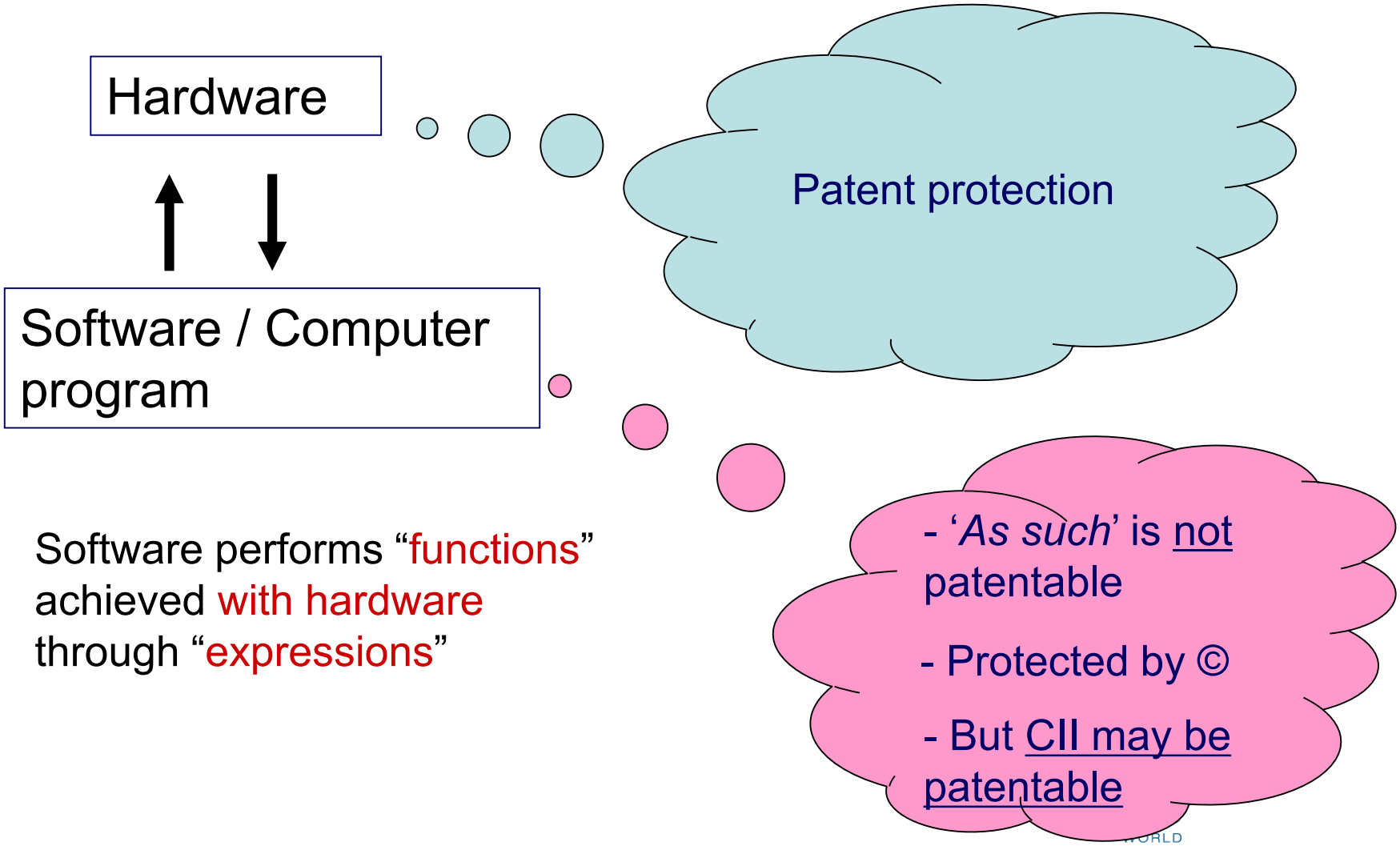
Source: WIPO Statistics Database, November 2022

Top 10 PCT applicants in "Computer Technology" in 2021

1	HUAWEI TECHNOLOGIES CO., LTD.	1471
2	PING AN TECHNOLOGY (SHENZHEN) CO., LTD.	1279
3	MICROSOFT TECHNOLOGY LICENSING, LLC	936
4	SAMSUNG ELECTRONICS CO., LTD.	923
5	SONY GROUP CORPORATION	602
6	NEC CORPORATION	546
7	HEWLETT-PACKARD DEVELOPMENT COMPANY, L. P.	535
8	NIPPON TELEGRAPH AND TELEPHONE CORPORATION	504
9	GOOGLE INC.	456
10	BOE TECHNOLOGY GROUP CO.,LTD	425

Source: WIPO Statistics Database

Introduction: Computer-implemented inventions (CII)



Software performs "functions" achieved with hardware through "expressions"

International legal framework - CII
TRIPS Agreement

Patentable subject matter

Article 27.1

"Patents shall be available for any inventions, whether product or process, in all field of technology, provided that they are new, involve inventive step and are capable of industrial application."

Article 27.2 and 27.3

Members may exclude certain subject matter (ex. plants and animals, inventions against *ordre public* and morality). Computer programs are not expressly excluded from patentability

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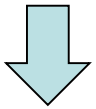
→No definition of the terms "inventions" and "technology"
→Different approaches in different countries

Exclusions in National / Regional Laws

Underlining considerations for exclusions

- Fundamental principles (ex. law of nature; mathematical methods) and abstract ideas (something that has not had a concrete application in the real world) not patentable

- Patents → promote technological innovation, non-technical creations not patentable (ex. mere economic theories, mental acts; business methods)



- Computer programs as such are excluded
- Inventions that include or embody computer program (CII) may be patentable

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→ Where to draw a line between:

- unpatentable computer program and patentable inventions that embodies, applies or uses the unpatentable computer program?

Should computer programs be protected by patents?

"NO"

Duplication with copyright protection

- computer programs - forms of writing or intellectual works to be protected by copyright

Patent protection of computer programs inhibits competition

- Cumulative and sequential innovation → requires access to source code
- Interoperability between programs, systems and networks

Time consuming patent granting process does not match the life cycle of many computer programs

- examination pendency period: 25.6 months (US); 3 to 5 years (EPO)

SMEs and independent software developers cannot afford patents

- Costs for obtaining and maintaining patents ex: 2 countries (JP, US) = $20,000; 7 countries (JP, US, DE, FR, UK, CN, KR) = $60,000

Should computer programs be protected by patents?

"YES"

The patent system supports the development of the software industry and computer-related industry

- inventions in the software arts deserve the same incentive provided for inventions in other technological fields
- disclosure of the invention accelerate software development

Copyright protection does not protect "ideas" behind the expression of computer programs

- copyright only safeguards against the literal copying of the source or object code; it does not protect the underlying technical concepts which often has commercial value

Low cost of copying and dissemination of computer programs requires patent protection

- ensuring inventors get a reasonable return on their commercially successful innovations

Patent protection is advantageous for SMEs and independent software developers

- attract investors and support business expansion

Thank you

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