China’s IP Development and R&D Investment

Made in China 2025 Conference

January 15, 2019
Is State Sponsorship of R&D Unique to China?

US vs. China in Government R&D Spending

- **U.S. Federal R&D Spending**
- **Chinese Government R&D Spending**

*in billions of current USD*
The world’s top 20 companies by their total R&D Investment in 2018

* Source: The 2018 EU Industrial R&D Investment Scoreboard
* Data extracted from respective annual reports of the above companies
R&D Spending (Percentage to Net Sale)

* Data extracted from respective annual reports of the above companies
Who filed the most PCT patent applications in 2017?

TOTAL NUMBER OF APPLICATIONS 243,500 ↑ 4.5%

TOP 10 PCT APPLICANTS
Number of published PCT applications

- **Huawei**: 4,024
- **ZTE**: 2,965
- **Intel**: 2,637
- **Mitsubishi**: 2,521
- **Qualcomm**: 2,163
- **LG**: 1,945
- **BOE Technology**: 1,818
- **Samsung**: 1,757
- **Sony**: 1,735
- **LM Ericsson**: 1,564

TOP 5 FIELDS OF TECHNOLOGY
Number of published applications and share of total

- **Computer Technology**: 19,122 (8.6%)
- **Digital Communication**: 18,400 (8.2%)
- **Electrical Machinery, Apparatus, Energy**: 15,223 (6.8%)
- **Medical Technology**: 15,024 (6.7%)
- **Measurement**: 10,082 (4.5%)

TOP 10 COUNTRIES
Number of PCT applications and % growth since 2016

- **U.S.**: 56,624 ↑ 0.1%
- **China**: 48,882 ↑ 13.4%
- **Japan**: 48,208 ↑ 6.6%
- **Germany**: 18,982 ↑ 3.7%
- **Republic of Korea**: 15,763 ↑ 1.3%
- **France**: 8,015 ↓ 2.4%
- **U.K.**: 4,590 ↑ 1.2%
- **Switzerland**: 4,380 ↑ 2.8%
- **Netherlands**: 1,666 ↓ 5.2%
- **Sweden**: 1,500 ↑ 7.0%

*Source: World Intellectual Property Organization (WIPO)*
GPS

- Initially developed by DoD by for military purpose in the 1970s\(^1\)
- Allowed for civilian applications in the 1980s\(^2\)
- Congress provided over $1.42 billion to fund the Air Force GPS program in Fiscal Year 2019 ($1.18 billion in 2018)\(^3\)

Hey Siri

- Personalized Assistant that Learns (PAL), funded by DARPA\(^4\)
- A cognitive computing systems to make military decision-making more efficient and more effective\(^5\)
- Siri Inc. was launched in 2007 to put the technology to civilian use, later acquired by Apple Inc.\(^6\)

---

2. See [gps.gov](https://www.gps.gov/policy/funding/2019/)
Touchscreen

- Invented by scientists funded by NSF and CIA/DCI
- The inventors founded the company FingerWorks
- Acquired by Apple in 2005

Internet

- Started as Arpanet - an unprecedented network of computers
- Initially funded by DARPA
- A decentralized communication system sought during the cold war, to survive envisioned enemy attack

What Makes an iPhone so Smart?