Who is leading the 5G patent race?

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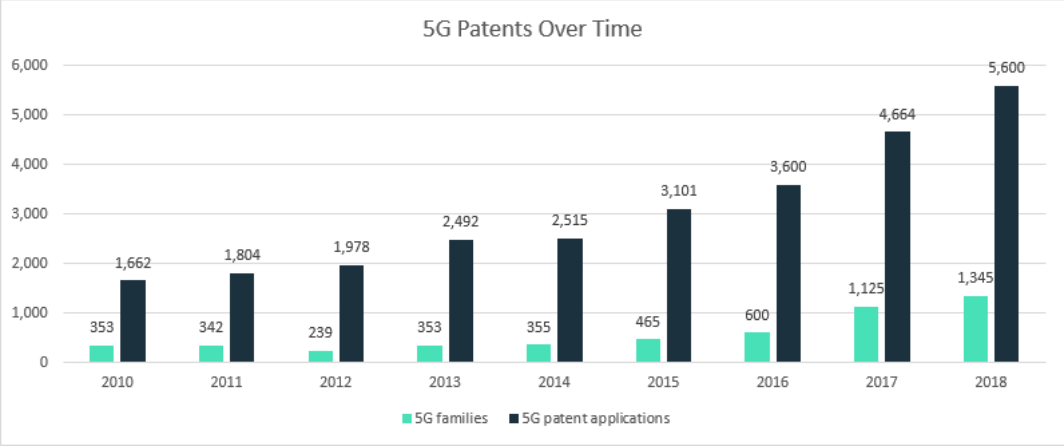
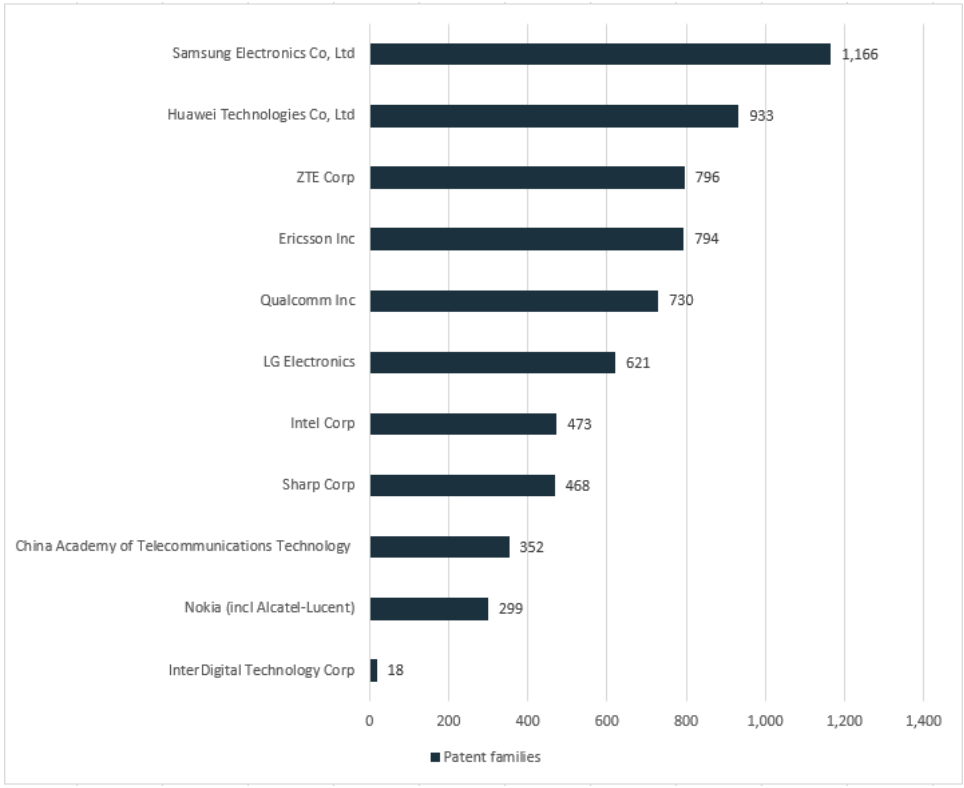
The long-term vision is that 5G will lead to the invention of thousands of new products, technologies and services, increase productivity and allow for new industries to emerge. A global 5G network would unify mobile communication and connect individuals or devices to everything through the Internet of Things (IoT). 5G technology can connect vehicles, ships, buildings, meters, machines and other items with electronics, software, sensors and the Cloud, while embedded 5G technology would allow machines to exchange information and integrate computer-based systems in the physical world. In recent years 3G and 4G patent owners have controlled the way in which mobile technologies have been used in the smartphone industry. Therefore, 5G patent owners will likely become technology and market leaders by enabling 5G connectivity in various markets. Using the database and analytics of the IPlytics platform tool, Table 1 illustrates the increasing number of 5G SEPs that have been declared over the past five years – 5G SEPs are the patents that any company will have to use when implementing a standardised 5G technology.

Figure 1. Annual number of 5G SEPs being declared



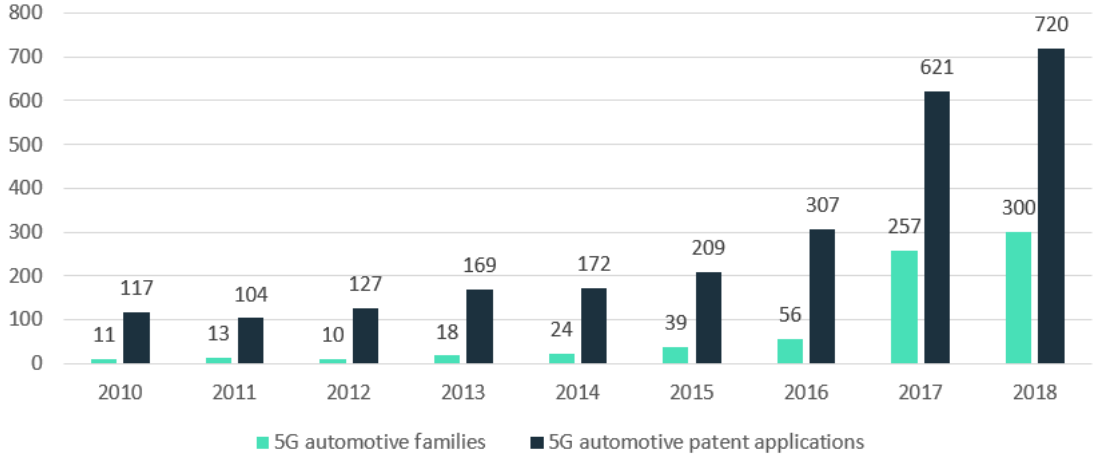
While the implementation of 3G and 4G mainly concerned smartphone industry players, 5G will enable connectivity in the entire physical world through the IoT. In the future, any sector with some reliance on connectivity (eg, transport, energy, manufacturing, healthcare and entertainment) will make use of 5G and therefore use 5G SEPs. Successful 3G and 4G patent licensing programmes have demonstrated that income from patent royalties can be substantial; the target market for 5G patent licensing will be much larger than 3G and 4G since 5G patents will be required outside of the smartphone sector. Using the IPlytics platform tool, Table 2 illustrates the top 10 patent owners of 5G SEPs. The South Korean companies Samsung and LG, the Chinese companies Huawei and ZTE, the US companies Qualcomm, Intel and Interdigital, the European companies Ericsson and Nokia and the Japanese company Sharp are the major 5G patent holders.

Figure 2. Top 5G SEP owners



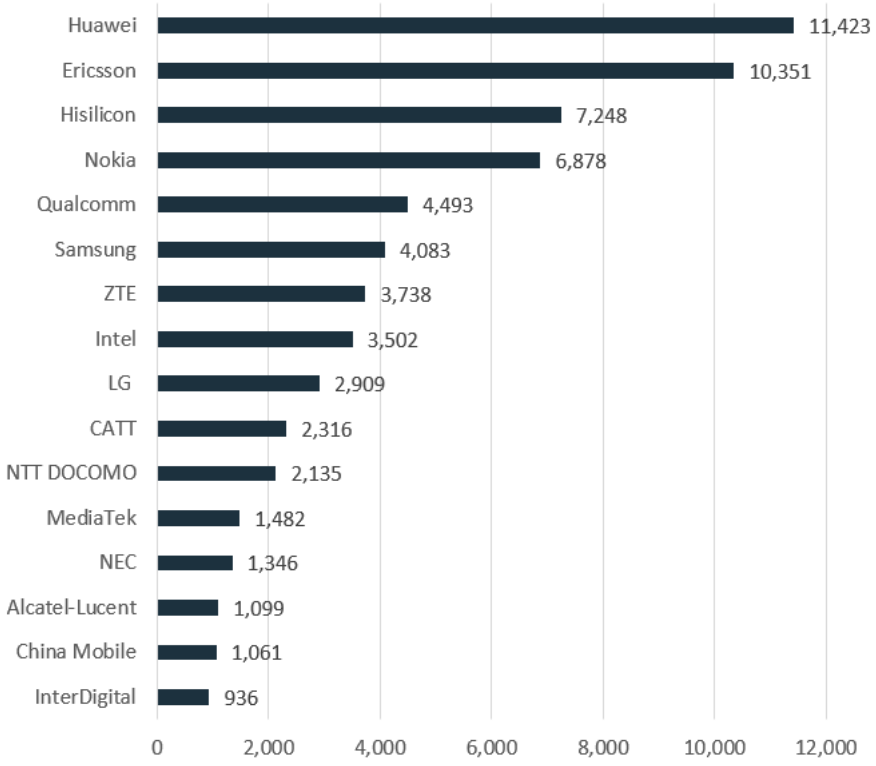
The automotive industry will most likely be one of the first to become reliant on 5G technology, connecting vehicles to other vehicles, roadsides, traffic lights, buildings and the Internet to process data across cars or in the cloud. Table 3 identifies 5G SEPs that relate to the connectivity of cars and automobiles. As the table shows, the number of 5G patent registrations has increased rapidly in recent years.

Figure 3. Annual number of 5G SEP registrations related to the automotive sector



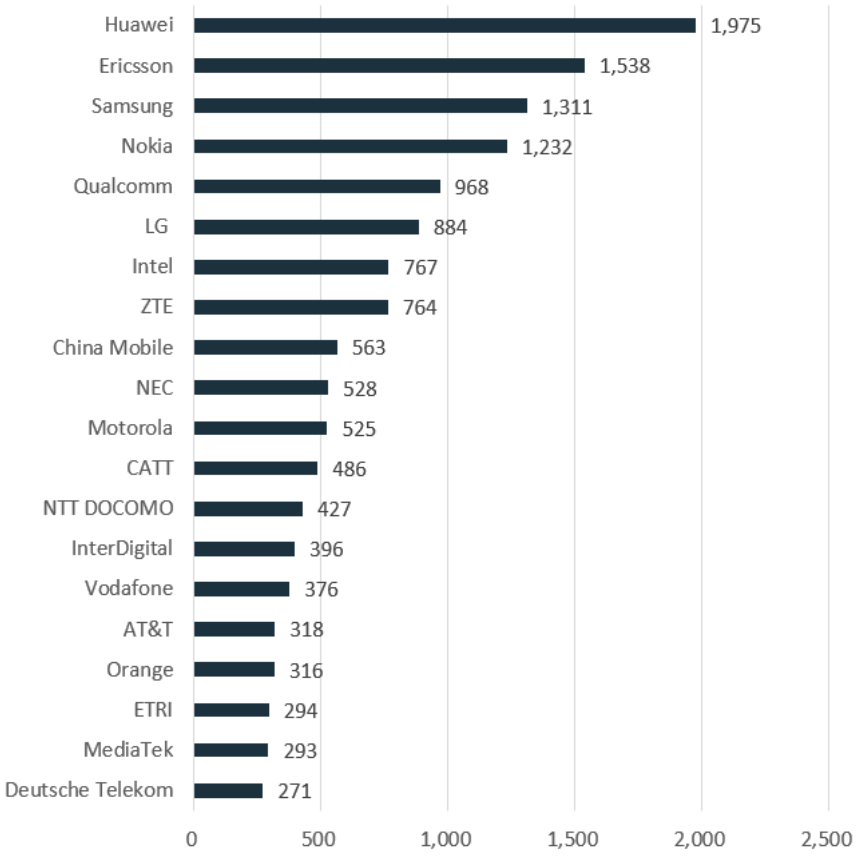
The interconnectivity of different systems and communication across multiple devices relies on a common specification of the 5G standard. Due to the market potential of 5G, it is worth looking at the companies that are actively involved in the development of the 5G standard. The 5G standard is developed and adapted at international meetings where companies present and submit technical contributions. Using the IPlytics platform tool, Table 4 shows the top companies that have made technical contributions to 5G technology.

Figure 4. Top companies making technical contribution to the 5G standard



Another way of measuring involvement and investment in the development of the 5G standard is the attendance of engineers at the standards-setting meetings. Attendance at such meetings reflects the investment a company is making to developing the 5G technology, as companies send highly skilled technical engineers who commit their time to prepare, travel and discuss the latest technological developments. Using the IPlytics platform tool, Table 5 illustrates the number of employees per company who have been attending 5G standard setting meetings.

Figure 5. Top attendance at 5G meetings



The licensing of 5G SEPs looks set to become a major trend not only for the smartphone industry but for any manufacturing sector where connectivity is important. Senior patent managers and patent directors involved in 5G patents should consider the following:

- Future technologies involving connectivity will increasingly rely on patented technology standards such as 5G.
- The number of 5G SEPs is constantly rising – patent directors should start to consider royalty costs and appropriate security payments.
- Patent directors should not only consider information retrieved from patent data, but also monitor and consider other data concerning standardisation, such as technical contributions and meeting attendance.
- Senior patent managers must understand the dynamic nature of the SEP market, where patent assertion entities often acquire patent portfolios to assert extensive royalty payments.

Manufacturers should pursue a common strategy for patenting and standardisation to ensure that they are fully engaged in the development of future technology.
