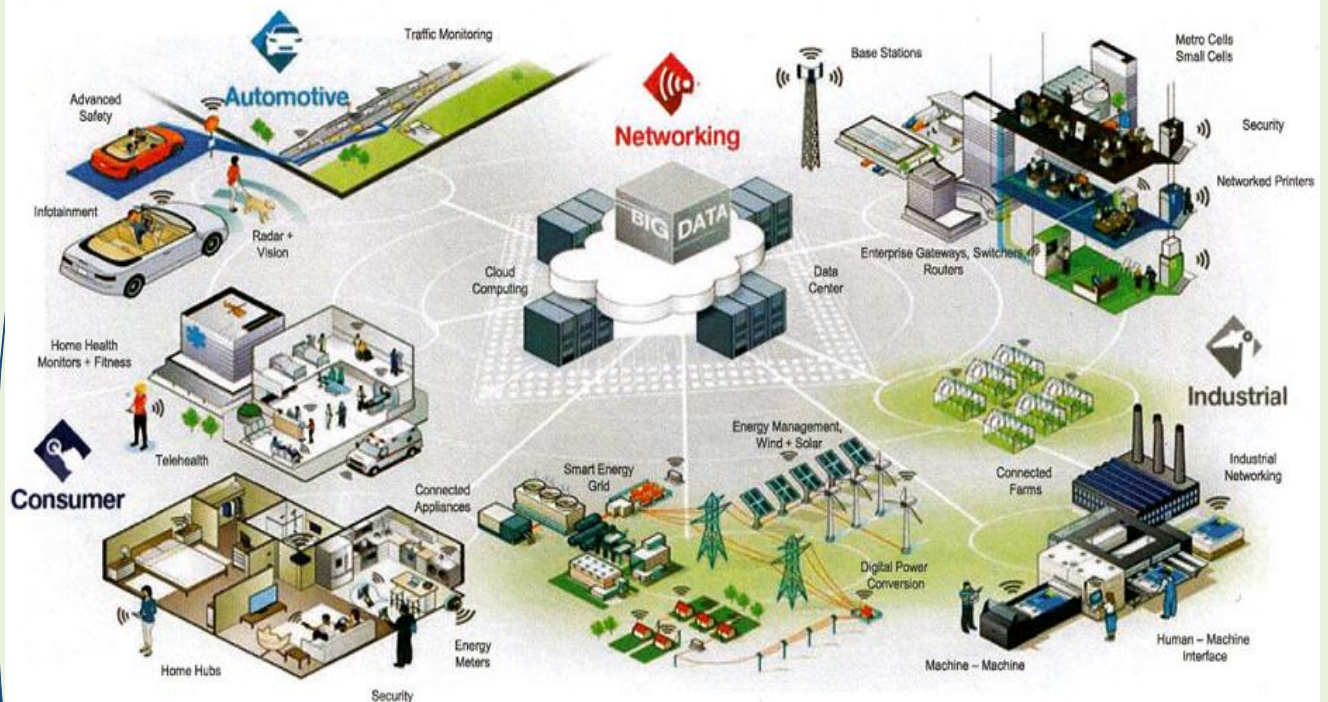


# Intellectual Property Landscape

## Internet of Things

### The Internet of Things



Powering Ideas

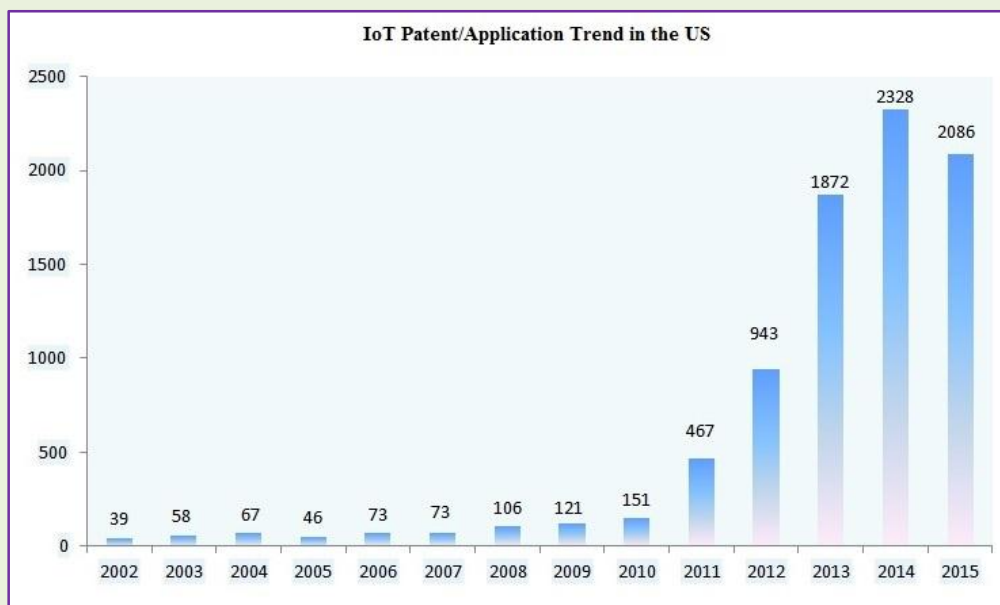
## **INTRODUCTION**

At first, the Internet of Things (IoT) may seem like an idea straight out of science fiction. However, on closer consideration, we realize that the process of connecting everyday electronic objects the internet has long been underway, and is accelerating. With miniaturization, most devices are now capable of having a number of communication modules in addition to their usual function. This is not true merely of the expected devices such as computers, laptops and mobile phones - even home appliances such as refrigerators, ACs, and wearable devices are becoming a part of the internet.

more aspects of our lives than it has done until now with more information being available regarding the location, condition and use of our devices. The present report focuses on what these developments mean for the growth of innovation and intellectual property in the related fields. Further, an analysis of the patent space will give an insight into the major players in the market, and the direction that the technologies are taking.

## **IoT AND IP STRATEGIES**

Not only does this create unprecedented opportunities for organizations working in a wide variety of areas, it is absolutely



Further, automobile organizations and medical device manufacturers have a significant interest in connecting their devices and information collection. The number of connected devices is likely to reach tens of billions in the coming years. More importantly, internet will pervade

essential for organizations to use the capability that the IoT provides. Companies in diverse areas such as home appliances, fleet management and medical equipment manufacturers are going to use IoT more and more. Facilitating ease of use, productivity as well as information

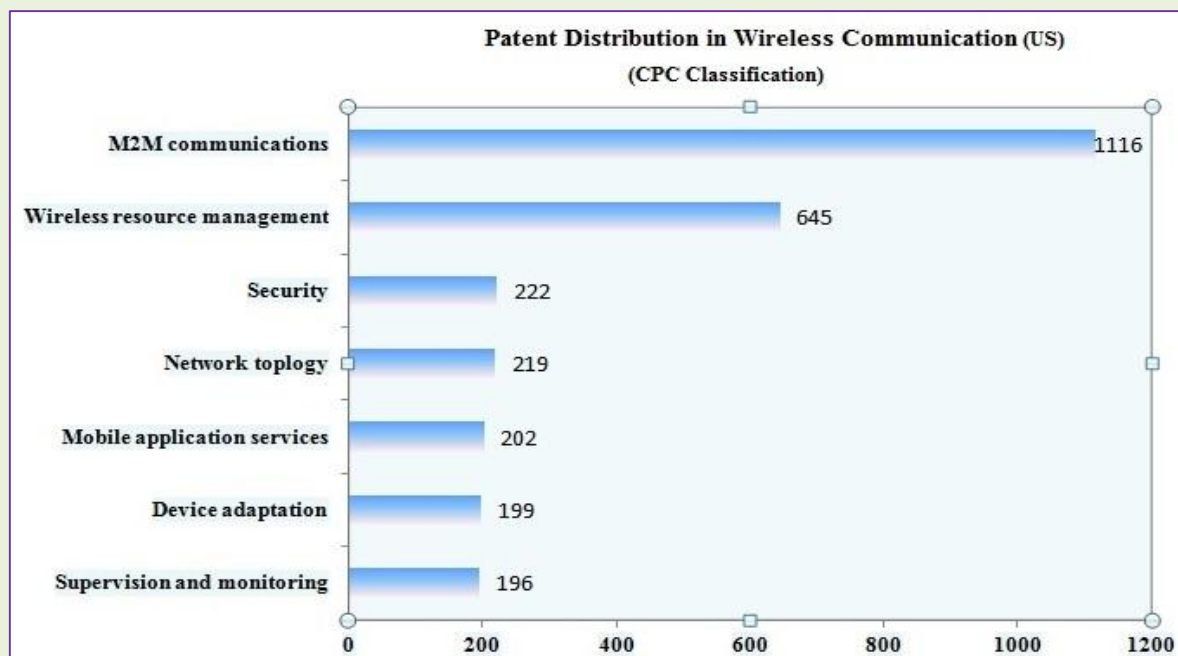
collection all are areas where organizations will benefit from the use of IoT.

The IoT technologies will necessarily need to integrate and customize a large number of already familiar technologies such as communication networks, sensors, cloud computing, user interfaces, data processing, data security etc. This would require a large number of innovations across these technology areas. These innovations will be associated with gathering insights regarding the use of a product by the customer and using this information to enhance the services provided, as well as for providing additional services. As a result, it would give rise to new intellectual property in the form of patents in all of these familiar technology

products and from the intellectual property developed.

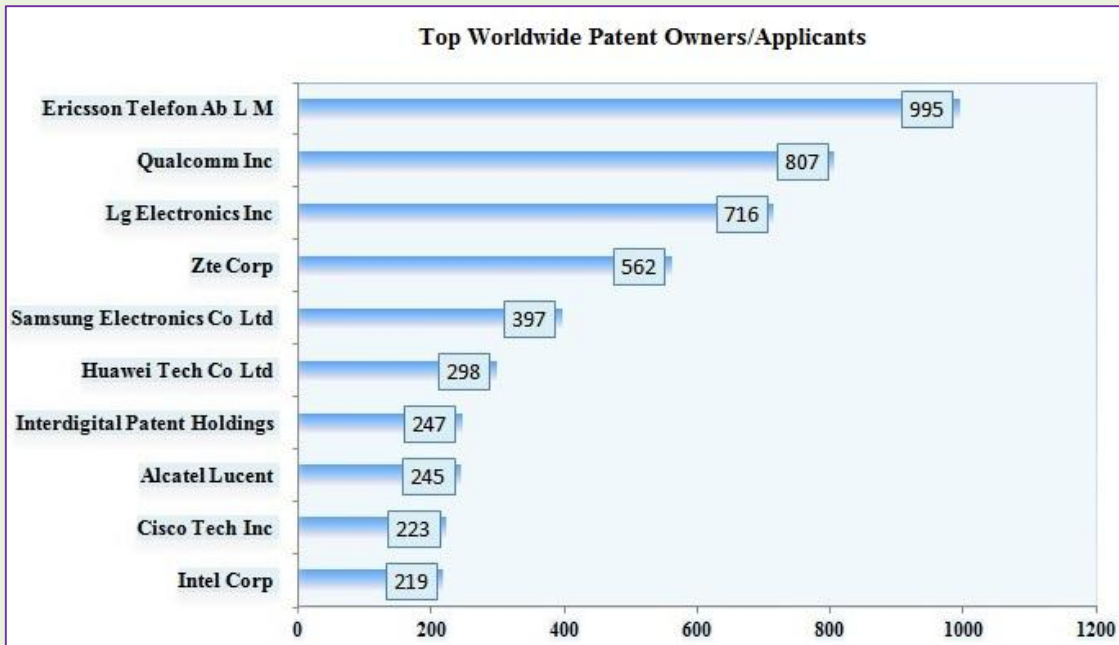
### NEW SPIN ON EXISTING TECHNOLOGY

Another interesting aspect of IoT is that with enhanced connectivity, the technology already developed and used for data collection, device sensing, and performance monitoring will be utilized better. With wireless and mobile access, data will be available for analysis faster, in real-time and in more volume than before. increase, depending on how it finds integration with IoT. Just as an IT strategy is now indispensable for organizations working in any field, an IoT strategy would



areas. The chart above depicts the fast increasing trend of filing patents in IoT. Finally, this would lead to increased revenue for the adopters both directly from

become indispensable in the near future, in order to match not only the industry standards, but also customer expectations. Companies must have a sharp awareness



of how they are aligned with respect to IoT adoption and use.

Further, IoT will enable unprecedented growth in customer collaboration. While this provides a lot of opportunities, it also raises concerns over privacy and data security. In this scenario, the developments in the use of IoT will be innovation driven, and are likely to give rise to a huge amount of intellectual property regarding data. As a result, the value of related pre-existing technology as well as IP is likely to handling in large volumes and ensuring data security. The chart below gives an indication of the patents granted or filed in different sub-areas in wireless communication with intent for use with IoT.

### **IP LANDSCAPE & OPPORTUNITIES**

The broad technological areas to watch out for during the coming years for IP will be the following.

**Sensors:** An increasing number of devices come fitted with sensors and the existing devices are being retrofitted in order for them to be used as sources of IoT information. Sensor data can be used to understand the usage pattern of the device, or to measure anomalies in the function, both of which can be used to improve service and design. For certain devices, it will be beneficial to monitor and maintain location data. There is a huge scope for innovation in both data collection and monitoring, as well as in the usage of this information to make decisions.

**IoT Network:** In order to interconnect devices and communicate sensor data, it will be necessary to come up with innovations in how the data is transferred and handled over networks. Further, it will be necessary to ensure data security for the collected data. This provides opportunities in authentication,

encryption, hardware security, and data transmission security.

**Data Management:** The volume of data being collected and handled by organizations will increase manifold. To handle this Big Data, new innovations in data processing, data storage, cloud computing and data analytics will be required.

In all of these areas, patent filings are an indication of the vision and the future direction of an organization or a technology area. The above chart gives an indication of the companies which are most active in the IoT IP space.

It should be noted that these graph depict a trend, and the actual number of patents that will ultimately be relevant to IoT will be higher, depending upon how the technologies evolve to be used with IoT.

### **RELEVANT SECTORS**

As the names Internet of Things, or Internet of Everything indicate, it is hard to imagine a technological domain that will remain unaffected by these developments. Currently, the following fields are witnessing the fastest developments.

**Everyday Appliances:** Household lighting, kitchen appliances, refrigerators, washers-dryers, vending machines.

**Medicine:** Pills embedded with chips, wearable devices to monitor physical activity, heart rate, sleep patterns. Maintenance of expensive installed equipment. Cisco's Connected Athlete is a good example.

**Automobile:** Driving data, vehicle performance leading to better safety and better design, fuel economy.

**Public Service sector:** Traffic monitoring, Air quality monitoring, Emergency route handling, smart cities. IBM's Smarter Planet initiative is an example.

### **CONCLUSION**

With IoT affecting all technological domains, big market players have begun acquiring IoT companies for their IP. Samsung's acquisition of SmartThings and Google's acquisition of Nest Labs are the most recent examples. It is a matter of time before patent litigations proliferate in the IoT space. It is indispensable in this scenario for organizations with a vision for the future to have an IoT-IP strategy.



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