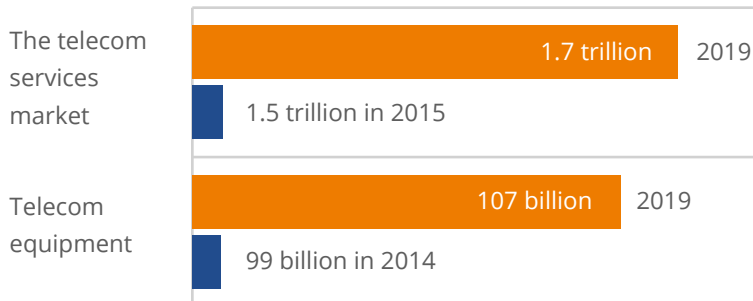# TELECOMMUNICATION TRENDS

Introduction

The telecommunication industry has developed steadily over recent years. Many enterprises significantly increased their sales, and it is expected, that in the coming future telecommunication will continue to be in great demand.

The telecom services market	1.7 trillion — 2019 / 1.5 trillion in 2015
Telecom equipment	107 billion — 2019 / 99 billion in 2014

The telecom services market is forecasted to worth around 1.7 trillion U.S. dollars by 2019 compared to 1.5 trillion in 2015. The global telecom equipment spending is projected to reach around 107 billion U.S. dollars in 2019. For instance, in 2014 it was 99 billion.

The most significant trends

Biometric security

The number of smartphone owners regularly using the fingerprint reader is increasing. Primarily, only premium smartphone models were equipped with such sensors. However, by the end of the decade fingerprint readers are expected to be included on all phone models and also incorporated into other devices, e.g. laptops.

Such an increase in popularity can be explained by various factors, e.g. the ability to be used as a more convenient and reliable tool for authentication purposes, for example, in a banking app.

> *"[...] the active base of fingerprint-reader-equipped devices will top one billion for the first time in early 2017. There are multiple private and public organizations which should consider how best to exploit the growing base of fingerprint readers and the large number of individuals who have become accustomed to using them on their phones."*

DDoS attacks

Due to further expansion of IoT devices, DDoS attacks are predicted to become more common. The online spreading of malware methodologies will enable even low-skilled cyber-criminals to launch an attack. As a consequence of super high-speed internet availability, the amount of junk data sent by botnet will be growing.

> *"[…] in 2017, Distributed Denial-of-Service (DDoS) attacks, a form of cyberattack, will become larger in scale, harder to mitigate and more frequent. Over the past few years, it has been a game of cat and mouse in which neither side has become too powerful, but this might change in 2017 due to the abundance of insecure IoT devices and the fact that large-scale attacks which exploit IoT devices' vulnerabilities have become simpler to execute."*

Autonomous driving safety

The number of fatalities in the USA caused by car collisions is expected to decrease significantly. Technological advances (e.g. automatic emergency braking, comprising forward-facing camera, millimeter wave radars, etc.) are estimated to become the contributing factors for this great safety improvement.

> *"[…] by 2022, annual US motor vehicle fatalities could fall by 6,000. Although there are other motor vehicle safety technologies that are likely to contribute to this reduction, the single greatest factor will be automatic emergency braking (AEB) technologies."*

5G

Significant steps towards 5G launch in form of LTE-Advanced and LTE-Advanced Pro are expected in 2017. Both provide higher speed, lower latency, and support for IoT devices. For instance, LTE-Advanced Pro data rate and bandwidth in 2017 will include 1Gbps/100MHz. Internet of Things will be one of the most important application fields for 5G.

> *"5G is likely to have a big bang impact. Its long fuse, which incorporates interim milestones in the forms of LTE-A and LTE-A Pro, has already been lit. While 5G is a significant, complex upgrade to 4G, it is not a single-step upgrade from the first release of 4G, but rather the culmination of many years of sustained upgrades to 4G networks."*

Machine learning in smartphones

Over 1/5 of smartphones sold in 2017 are forecasted to have a machine learning functionality, helping to perform various tasks even when not connected to the Internet.

This capability will improve indoor navigation, augmented reality, language translation, etc. Over years, Machine Learning will also be very likely included in cars, medical tools, IoT devices and further technologies.

> *"In 2017, over 300 million smartphones will have on-board neural network machine-learning capability. This functionality will enhance applications including indoor navigation, image classification, augmented reality, speech recognition and language translation even where there is little or no cellular or Wi-Fi connectivity, such as in remote areas, underground or on an airplane. Where there is connectivity, on-board machine learning may allow tasks to be done better and faster, or with more privacy."*

Digital navigation

Advances in the development of indoor navigation technologies will lead to the expansion of digital navigation by 2022.

In fact, satellite-based navigation normally doesn't work inside of buildings. This makes navigation through airports, train stations, hospitals and others simply impossible. In 2017, indoor location can be identified using a WiFi-router or a cellular network.

Additionally, a position can be also estimated by Beacons, LED lighting, Ultra-wideband (UWB) and Magnetic Positioning.

> *"By 2022, at least a quarter of all uses of precision digital navigation will include an indoor leg or be for an entirely indoor journey. Growth will be stimulated by sustained improvements in the accuracy of indoor navigation over the medium term.*
>
> *Precise indoor navigation's potential is significant, is likely to benefit most vertical sectors, and have impacts on government, businesses and consumers alike."*

Tablet market saturation point

In 2017 sales volume of tablets is expected to fall. The reason is the continuous innovation in smartphone and laptop industry, incl. tech functionality and slim design. According to a global survey, there is no single activity where the respondents prefer a tablet computer.

In fact, smartphones are ranked as most valuable devices. Laptops are on the 2d place. Place 3 goes to desktop computers.

> *"In 2017, we predict that sales of tablets will be fewer than 160 million units, suggesting that we have passed the peak demand for these devices. Tellingly, there is no dominant compelling use case for these devices. Across a range of online activities, tablets have their fans, but there is no single activity where tablets are the preferred device."*

IT-as-a-Service

According to Gartner, the 2017 global IT spending market for data centers, software and IT services is expected to be 1,477 billion dollars. In 2018, the global spending on IT-as-a-Service is estimated to worth 547 billion U.S. dollars, while in 2016 it was forecasted to be 361 billion. Taking the current growth rates into account, IT-as-a-Service will be over 50% of all IT spending by 2022.

> *"[...] by the end of 2018, spending on IT-as-a-Service will be just under $550 billion worldwide. For many enterprises, large and small, IT-as-a-Service is appealing for several reasons. It avoids significant capital expenditures and provides a predictable expense based on actual use which is easily scaled up or down, based on business needs."*

Conclusion

In the coming years, a range of changes is expected in the telecom industry.

For instance, fingerprint readers will transform the authentication process. Machine learning will go mainstream in smartphones. Cyber attacks will stay the key security challenge, while driverless car safety will be improved by such promising technology as, for example, automatic emergency braking. Due to the changes in consumer attitude, the tablet computers market is shrinking.

The expansion of indoor navigation will be boosted due to fast developing technological advances. 5G cellular networks will very likely be an important topic in 2017.

Finally, the spending on IT-as-a-Service worldwide is forecasted to grow considerably.

About Qulix

Qulix Systems is a global provider of software design and development, quality assurance and IT consulting services. Since the year of 2000, we aim at delivering high-quality software solutions meeting our clients' needs across multiple business domains.

Internet of Things, Telematics and Artificial Intelligence belong to our core software development competencies.

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