

# Impact of IoT and 5G on the Business of Cyber Security

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Upcoming technologies like IoT (Internet of Things), Block Chain, Cloud Computing etc, are result of the continuous increase in the bandwidth of WWW (i.e. 5G networks), thus more and more devices are getting connected to the internet/www. Now, to identify these devices uniquely, ip addressing also requires attention. Thus, to address these increasing number of devices over internet(www) it is required to move from IPV-4 (internet protocol version-4) to IPV-6 (internet protocol version-6), the next generation Internet Protocol (IP) having capability to address more devices over internet. Now because of increasing number of devices over WWW and increasing bandwidth of WWW, more and more users are getting connected to www, which increases the possibility of security breach and threats from the cyber world, thus we need to address cyber security, and its operational aspects like the business of cyber security, the performed work relates to highlight the promising areas of cyber security from the point of view of cyber economics

## Introduction:

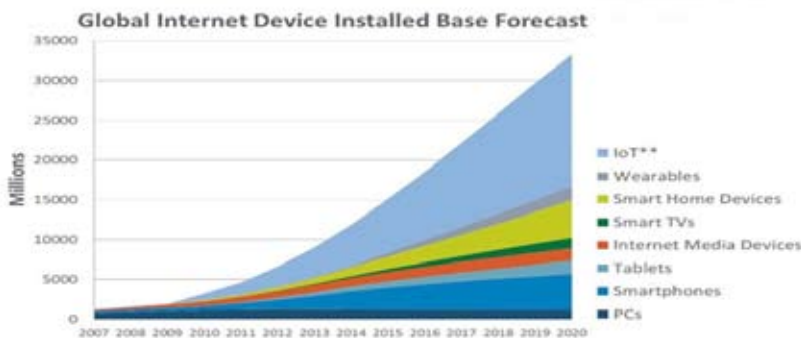
Internet of Things (IoT) the future of internet, is the result of internet-oriented aspects i.e. middleware, things oriented aspects i.e. sensors and semantic-oriented aspects i.e. knowledge [1]. The IoT device network can be established through a variety of agreed protocols and technologies, but as per the GSMA [2] common communication protocol for smart devices objects does not exist yet. Nowadays, machine-to-machine (M2M) connections are increasing globally and exponentially, and it is estimated that by 2020, the number of interconnected devices will reach more than 24 billion, Gubbi et al.[3]. This indicates that there will be huge growth in the automation industry,

which ultimately leads to Smart Cities. Figure-1 below is quite self explanatory, to understand the contribution of IoT in the cyber economics.

## 5G and IoT:

In this era of IoT, the Physical objects are not only gaining the characteristics of digital technology but also taking advantage of the digital aspect, Yoo et al.[4], this combination of digital technology and physical objects, leads to the collaborations among the partners of a variety of industries, Turber et al.,[5]. Innumerable studies are performed to quantify and predict the material impact of Fifth Generation (5G) and the Internet of Things (IoT), some of these focus on the cost aspect and others on the value to society.

However, even as these studies are ongoing, it is evident that 5G will spur innovation across many industries, and will provide a platform for enabling emergent technologies such as IoT, to become an integral part of our economy and lifestyle, 5G is the foundation for realizing the full potential of IoT. While 5G is set for commercial availability sometime around 2020, the industry is already working to develop new global standards and pre 5G products to benefit industries everywhere, the trend shown in Figure-1 exhibits that, the hardware, software, and networking industries along with the service providers of cyber world are going to have promising future, provided they exercise appropriate business model.



**Figure 1 :** Global Internet Device Installed Base Forecast

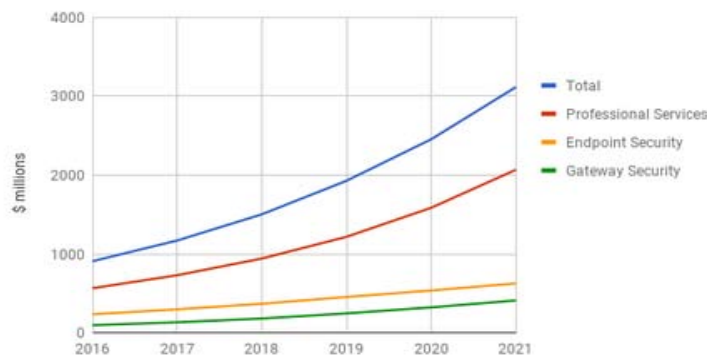
Source : Strategy Analytics, October 2014

### Business Model and Cyber Security

The business model relates to the bring the abstract strategies up to the practical level of decisions and actions, within the uncertainties of the modern business context [6, 7, 8, 9, 10]. Business models are foundation for many technological businesses, well-designed business model may lead to the success of even a mediocre technology in the markets, but a perfectly designed technology may fail because of a weak business model [11]. Literally Business model has been defined as an architectural [12]system of interdependent activities [13] and interrelated set of core logic and strategic decision variables [10, 14]; explaining transaction content, transaction governance and transaction relationship structures [15, 16] for maximized value creation and value capturing [13]. Understanding the business model is even more crucial for cyber security business where failing in business may cause serious risks beyond just economical. Figure-2, shows the forecasting of market trend, towards the expenses for security related issues in the coming future.

standardize the 5G and cyber security [2], one of 5GPPP's (a public-private-partnership body funded by European Union) recent publications, it is mentioned that 5G is business driven [3] , thus some important questions are obvious, like in a world flooded with 5G innovations with increased amounts of information, ultra-high speed and low latency, how is the security scene expected to

**Worldwide IoT Security Spending Forecast**



**Figure-2 :** Worldwide IoT Security Spending Forecast

Source : <https://www.zdnet.com/pictures/research-round-up-cloud-computing-iot-and-cybersecurity-iphone-x-and-more/6/>

Based on the analysis of the trend shown in figure-2 above, it is realized to put some light on the possible business impacts of cyber security in 5G/IoT, which may increase awareness regarding, how and why business model thinking matters. As we are already heading towards 5G and with all the hyper-connectivity and high-tech innovations and services, we are increasingly exposed to serious threats of cyber-attacks. Dobrian [17] marks that cyber security has been a major issue for sectors such as financial services, defense, healthcare, media and online social media. Concerned authorities are taking significant research effort to

improve? Is it about alternative ways of organizing existing techniques that facilitates security delivery? Or will 5G facilitate new kinds of innovations for cyber security? Furthermore, since 5G is deemed to be business driven, how to monetize security as a service in 5G is a significant question? It can be argued that the more monetized the security is, the more business entities will be interested to deliver secure services and products by investing more to it. From this perspective, there are two distinct types of organizations whose business is dependent on security. Firstly, organizations who are directly or indirectly involved in the delivery of security solutions. These companies either sell the security as a service or as a bundle with some other service, product or infrastructure. Secondly, there are all the other business organizations that have remarkable digital footprints and face the potential threats of cyber-attacks.

In an imperfect world as we live in, any cyber-attack will have direct or indirect impact of either or both of these type of organizations' business. In this article we show different ways to organize security offerings in the 5G era and how to monetize from that.

Cyber security is usually delivered by specific third party providers as service or as product or as a combination of service and product which helps organizations and individuals to protect their digital assets. The companies providing different cyber security related products/services, have two broad customer groups. The more successful customer group so far has been organizational entities, which are widely referred to as B2B (Business to Business) customers or B2G (Business to Government) customers in business literature. This group of customers has shown growing interest in investing for cyber security in recent years for the purpose of their own business/organizational sustainability. Since business organizations or government agencies are more cautious about the security of their digital assets, there has been a steady business opportunity in this segment. However, the second broad group of customers is individual consumers, who are referred to as B2C (Business to Customer) customers. For security providers, penetrating this customer group has been comparatively difficult up until now. This difficulty is triggered because till today the value of individual people's private data/ information on the internet and other networks perhaps seem to be dispensable by individuals themselves. Though, in the era of 5G where trillions of Internet of Things (IoT) devices are going to flood the home environment, this scene is more likely to change. The second type of companies whose business

is affected by cyber security is the ones who utilize the cyber space as a vital element for their businesses. This group can comprise almost all type of organizations in modern world. Among these, different organizations are exposed to different levels of cyber threats. Unfortunately, even in today's globalized world we still have organizations that are unable to evaluate the value of digital information at their disposal and some fail to invest at all at times or not enough for security. [18] Traditionally, organizations invest in cyber security solutions based on the need for security for improving cyber preparedness against potential attacks [18]. This strategy for investing in cyber security products/ services have been beneficial for many organizations, but, failing to estimate the need for security has resulted in fatality many times too. The lacking interest in investing adequate amount in cyber security solutions arise from the failure of being unable of new revenue generation.

### Conclusion:

This article discussed various aspects in relation to business for cyber security in 5G. We particularly elaborated the business centric approach on 5G security provisioning, and provided an overview the types of services that are emerging from the context of 5G. Security issues do not only relate to businesses offering such services but cyber threats are a risk to any user or device connected to the Internet. With the development of ICT and IoT technologies, hyper-connectivity is ubiquitous and present in situations we could not even imagine. However, 5G security is not just a technical issue but involves also what kind of business might exist when 5G hits "full force". Business model approach can help companies to identify potential

avenues of business opportunities and how to actually monetize from 5G.

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