

THE INTERNET OF THINGS - BUSINESS TRANSFORMATION

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ABSTRACT: The Internet of Things (IoT) offers new horizons for the development of the Internet network and business: consumer products intelligent, huge amounts of information in real time with the possibility of solving immediate problems, and innovative new types of business. But beyond these technological opportunities even discern significant risks in the operation information stored but also devices.

KEYWORDS: Internet of Things, IoT, Big Data, cybersecurity, business value.

1. INTRODUCTION

We live in a world dominated by the technological revolution that was preceded by far, but still present - the information revolution, which in turn was based on Internet revolution.

Technologies that enable billions of objects to communicate daily with each other via the Internet have enormous potential to change our way of living and everyday life. These technologies are a way to boost productivity, to keep us healthier, to make transport more efficient, reducing energy needs and we make our lives more comfortable.

The definition for Internet of Things abbreviated as 'IoT', in Oxford Dictionary, is "The interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data".

The majority of objects in our immediate vicinity and in our environment will be transformed in the near future intelligent objects through a simple and ordinary Internet connection through a smartphone and the information stored in the cloud can be analyzed any time. At the moment IoT draw attention to cyber security so that hackers cannot compromise devices that are connected to the Internet. IoT is a complex and growing network being estimated for 2020 a total of 21 billion connected devices which currently, worldwide there are 10 billion devices connected to the Internet, reported a population of about 7 billion people.

2. GENERAL INFORMATION

Over time companies collect and store large amounts of data and IT solutions were implemented to find solutions to different problems to solve. IT

professionals understand that if they could bring many disparate data sources in one place and to interpret them, they would become a goldmine of valuable information. Thus, it could generate new sources of revenue, cost reductions huge, process optimization, and many other opportunities. Over the past two years, IoT has become a hot topic in building strategies that promise to transform businesses by leveraging the power of real-time information and machine learning. By exploiting power of information in real time can build solid business strategies and plans justifying to the budget. Storage space is virtually unlimited computing power of processors doubles every two years validating Moore's Law and devices are becoming cheaper to produce.

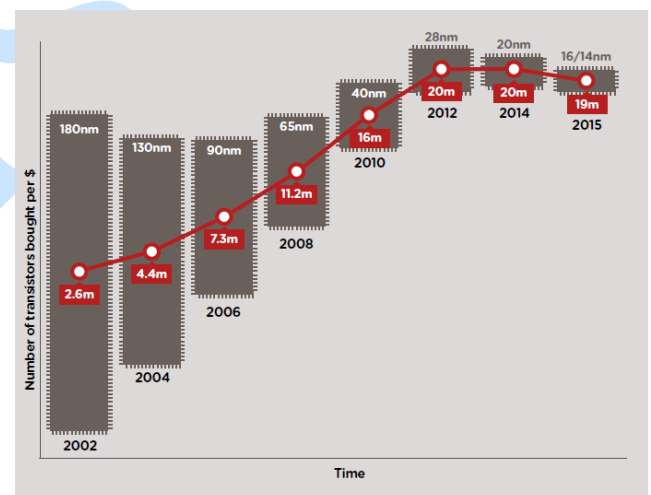


Fig. 1 Moore's Law
(Source: www.businessinsider.com)

Bluetooth communication standard, now in version 4.2 is the latest version of the technology, and it evolves to the evolution of IoT, this is just the beginning of the second digital revolution.

The sensors will monitor our health, how we move, our environment will help us more easily socialize and explore the world in ways we can barely imagine. IoT has the potential to have a greater impact on society than the first digital revolution.

According to statistics there are more than 7.2 billion people on the planet with an annual increase of 1.2 percent. On the other hand, the number of mobile devices exceeds 7.2 billion units operating with SIM

card type. No other technology has had an impact as big as mobile telephony, with phenomenal growth never before, from 7.2 billion within 30 years.

The concept of the Internet of all things is not new, it first appeared in the late 90s. Internet everything is a collection of hardware and software. The hardware consists of devices that are / interconnect (sensors, smartphones, 4G telecom networks, Wi-Fi, Bluetooth, etc.) and the software platforms include storage space and data analytic applications that are provided to users. When these elements are combined to provide real-time, there may be a positive influence on businesses that conduct.

IT development is primarily due to the cheapening accessibility smart devices and small size semiconductor chips, resulting in devices small enough size and powerful in terms of computing power so as to be invisible in the physical world.

Second increasing the availability of the Internet, communications networks and their capacity had a role in the development IoT community. Failure to connect a static computing environment various devices was resolved wireless networks that have allowed interconnection.

The emergence of open-source software, hiring hardware and data storage in the cloud have resulted in a reduction in the cost of IT budgets resulting in an easier and simpler to maintain and organize data increasingly bulkier. Thus, innovation in data storage management and clearly defined IoT's role in everyday life.

IoT and Big Data work together on the development of companies with technologies that underpin them. The basic structure of IoT is:

At the first level, fog or edge computing, are found all kinds of devices and sensors that are interconnected and transmit information in real time.[B+14]

Their operation is determined by a series of systems, communications technologies and protocols. At this level devices that exchange information between them subsequently make smart decisions based on this information.

This small date is sent via a global infrastructure IaaS, level 2 – cloud, to the datacenter. Once arriving at this point there is a detailed analysis of their database and storage in organized for handling large data volumes (fig. 2).

Level 3 (Fig. 2) Implementation of all these technologies is achieved due to financial and time resources very expensive, generally by calling for integrated applications-developed by companies like Hortonworks and Cloudera. The public cloud vendors all offer Database as a Service (DaaS) technologies, where these complex stacks is running as a managed service and accessible via the API to developers.[G+13]

The advantage of this service information management consists in automatically handle auto scaling and database management tasks, which is a gain of time managing business requirements.

In the level 4 (Fig. 1) can build applications to exploit existing information aiming to increase business value. Real-time data is what drives IoT.

The true value of the IoT on the number of data sources, different, which collects real-time information from multiple devices, resulting providing new insights in real time. [Gro08]

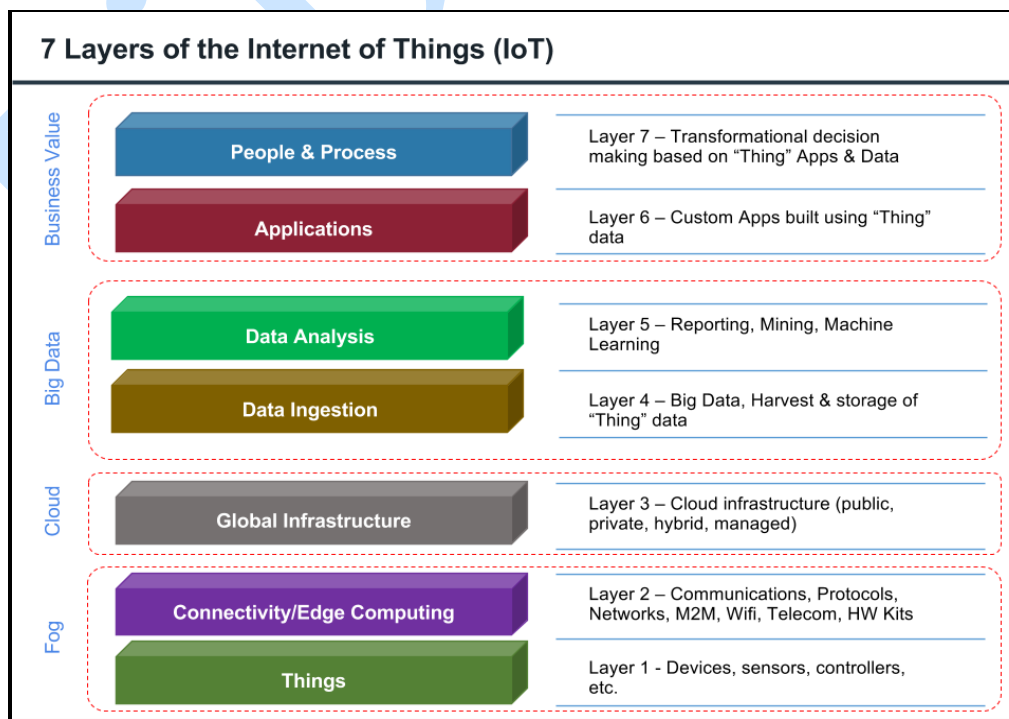


Fig. 2 Basic technologies of IoT (Source: Cloud Technology Partners Inc., 2015)

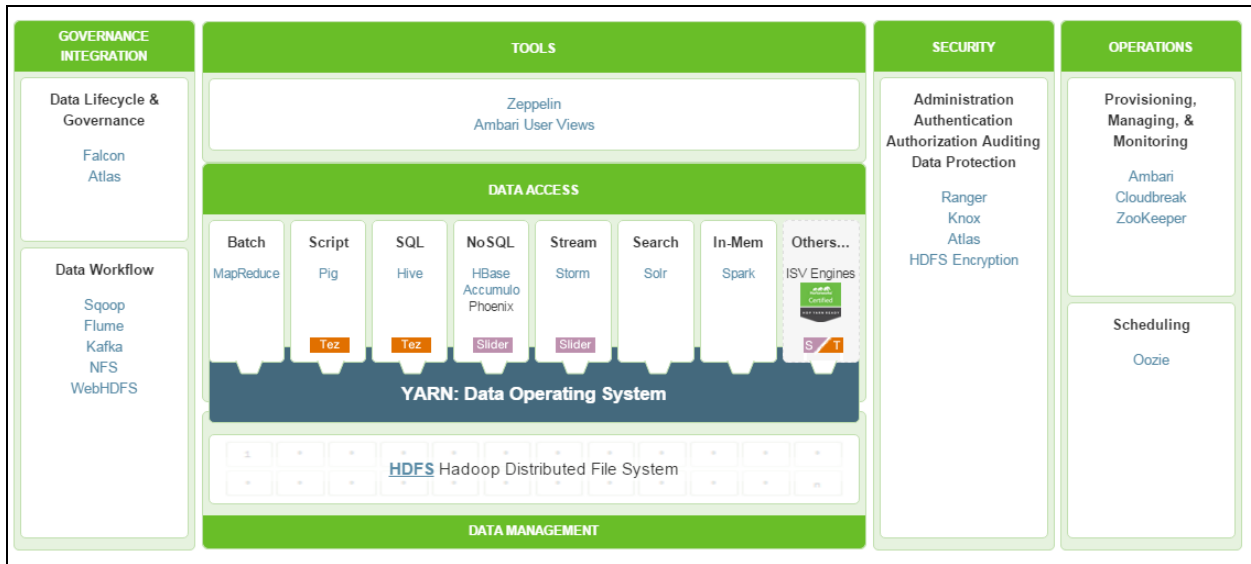


Fig. 3 Big Data Technology (Source: Hortonworks, 2015)

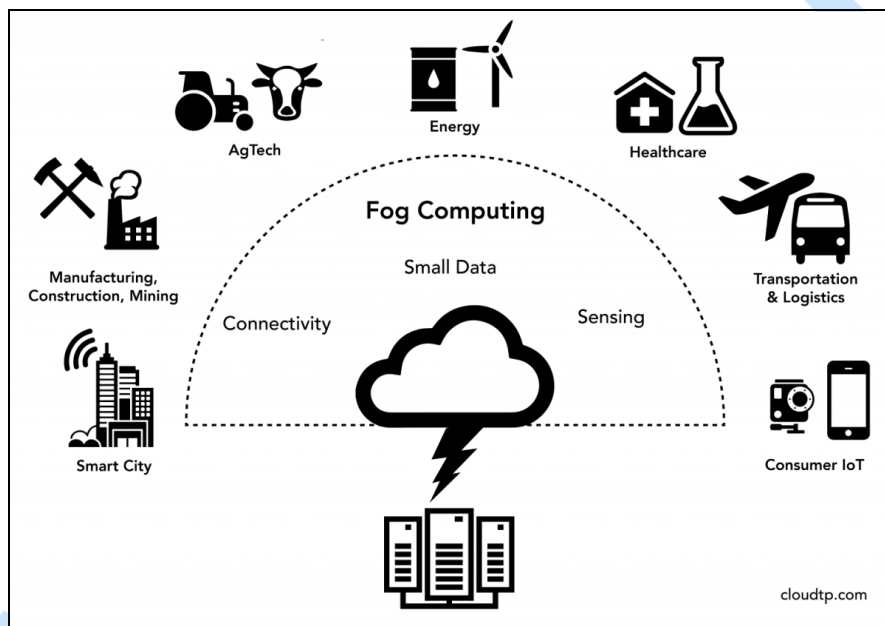


Fig. 4 Business value of IoT (Source: www.cloudtp.com)

3. BUSINESS VALUE OF IOT

IoT full adoption, by connecting billions of devices, could generate unpredictable social changes in their entirety. For a full adoption IoT requires a thorough analysis of public perceptions of the benefits and risks of the technology. In this regard, civil society has an important say and application developers and researchers need to take account of this aspect for the development of their concerns, so that the benefits and risks are balanced proportion.

Business evolution while the emergence of a new topic (ideas) is crucial. There is an impressive increase in research activity in the early appearance of articles subject materialized through publications, conferences, meetings, following a period of decreasing activities due to exhaustion interest for the subject, again following an exponential increase in activity due to its relevance to investors.

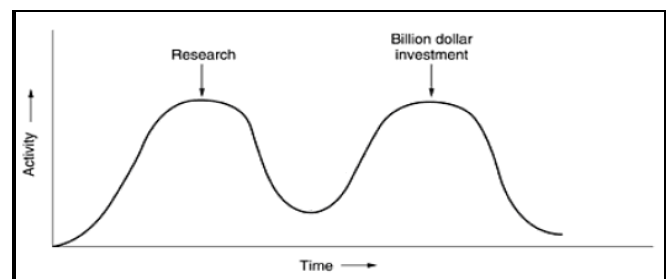


Fig. 5 The key moments in adopting new technologies

The new concept of manufacturing products is to eliminate those elements that lead to the development of a product difficult, cumbersome to use etc., resulting in a product in terms of hardware subjected to a limited number of constraints. [C+14]

This friction from the hardware can not be entirely eliminated, with real world constraints that simply can not find, yet, solving the software.

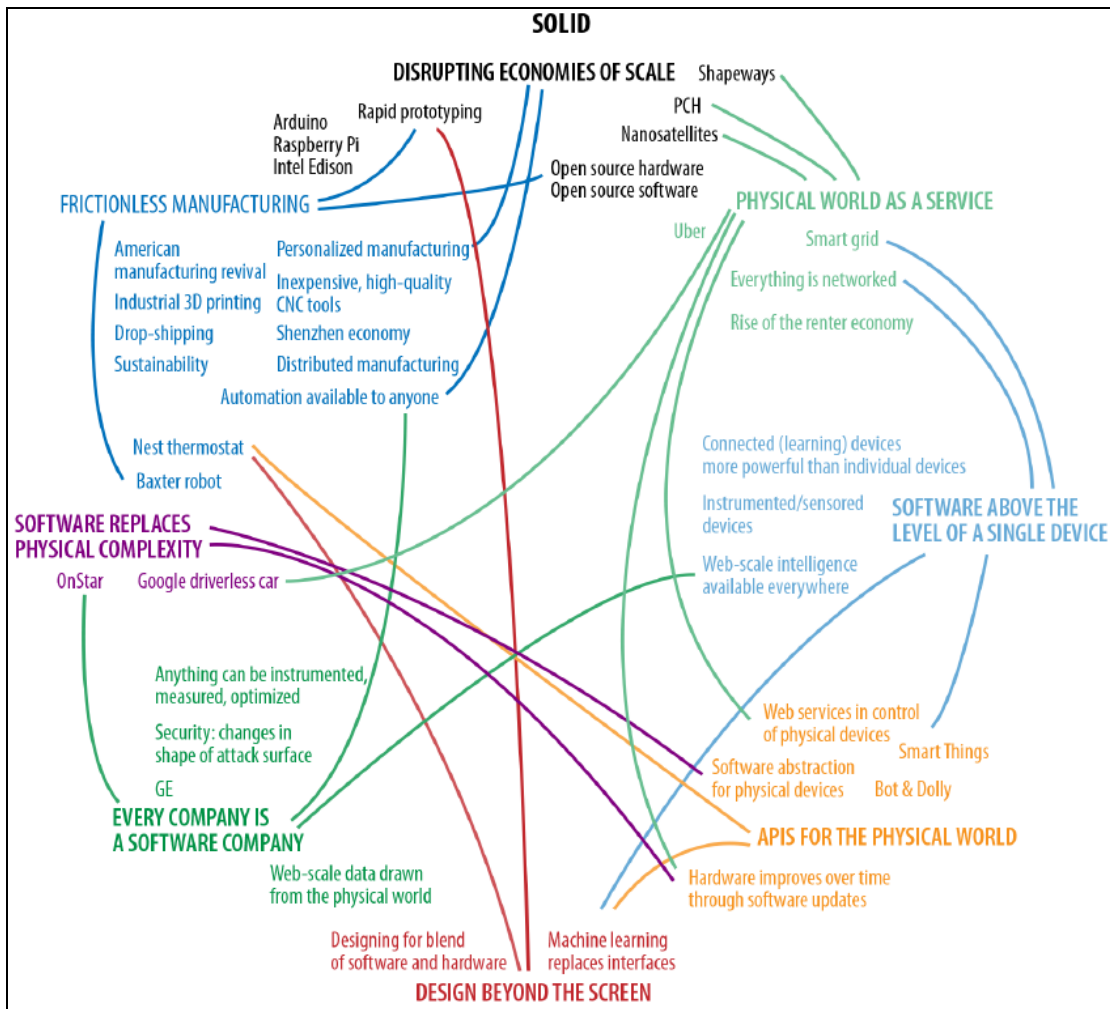


Fig. 6 Disruptive economies of scale (adaptation by The Internet of Things is Now, Morgan Stanley, 2014)

Internet of Things generate software applications are adaptable to many types of devices, it is one of the key advances in Web 2.0 applications in the physical world. Artificial intelligence is present through interconnections between devices that surround us and the many different types of software.

CONCLUSIONS

In the last decade the software industry has been influenced by a series of revolutionary developments in this area. Internet has become, both in terms of hardware and software, in the middle, the center of gravity, present in all products sold. The role of IoT, so far, is to strengthen and expand existing IT infrastructure. A second digital revolution is about transforming business models so that companies sell their products in a new, different and better completely, predicting consumer expectations.

REFERENCES

[B+14] **F. Bonomi, R. Milito, P. Natarajan, J. Zhu** - *Fog computing: A platform for internet of things and analytics* - Big

data and internet of things: a roadmap for smart environments, Book Studies in Computational Intelligence Volume 546 2014, pp 169-186, ISBN: 978-3-319-05029-4 (Online), 2014.

[C+14] **R. I. Ciobanu, V. Cristea, C. Dobre, F. Pop** - *Big Data Platforms for the Internet of Things* - Big data and internet of things: a roadmap for smart environments, Book Studies in Computational Intelligence Volume 546 2014, pp. 3-34, ISBN: 978-3-319-05029-4 (Online), 2014.

[Gro08] **I. Grønbaek** - *Architecture for the Internet of Things (IoT): API and interconnect*, Sensor Technologies and Applications, SENSORCOMM '08. Second International Conference, pp. 802-807, ISBN 978-0-7695-3330-8, 2008.

[G+13] **J Gubbi, R Buyya, S Marusic, M. Palaniswami** - *Internet of Things (IoT): A vision, architectural elements, and future directions*, Future Generation Computer Systems, Volume 29, Issue 7, pp. 1645–1660, 2013.