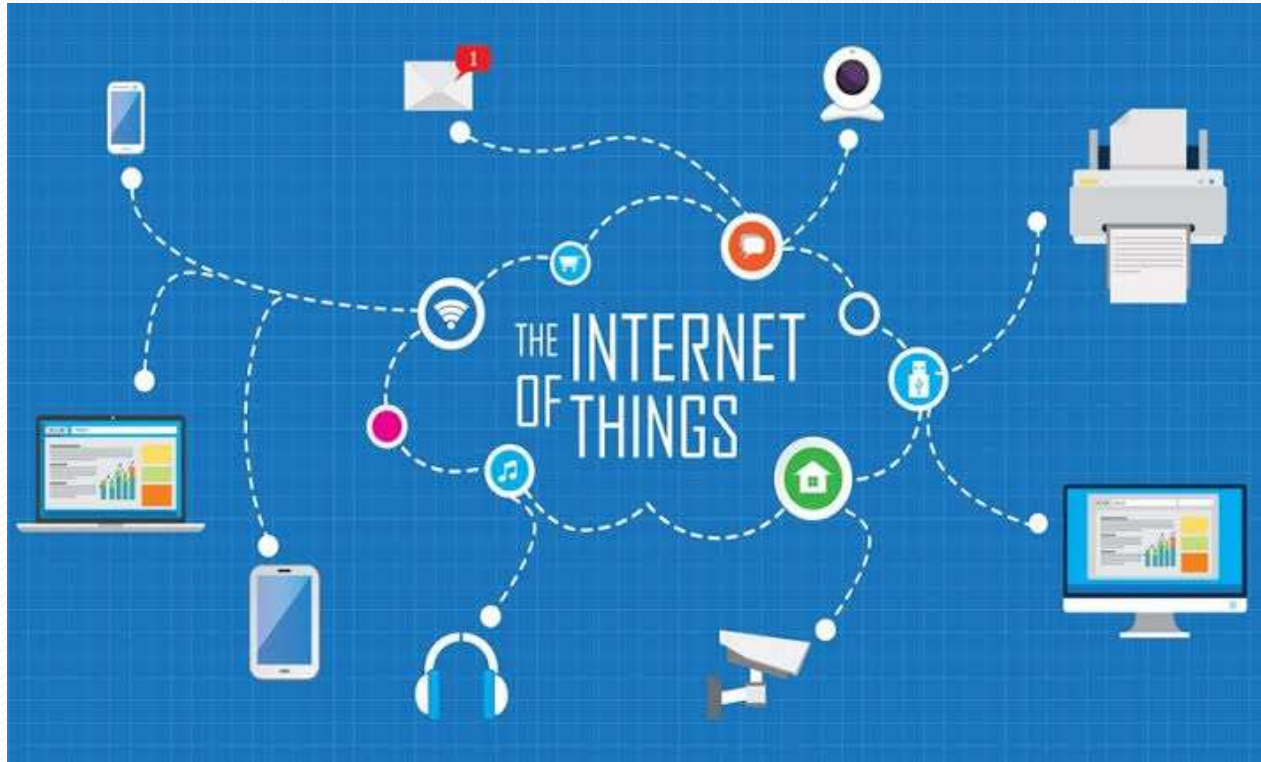


Welcome to The World of Internet of Things



All Information Which You Want To Know About
Internet of Things

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FUTURE AND CHALLENGES OF INTERNET OF THINGS

Plan of Presentation

- What is Internet of Things?
- How IoT Works?
- Current Status & Future Prospect of IoT
- Knowledge Management – From Data to Wisdom
- The Future of IoT
- The Potential of IoT
- Few Applications of IoT
- Technological Challenges of IoT
- Criticisms & Controversies of IoT
- References

What is IoT ?

The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data.

IoT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between the physical world and computer-based systems, and resulting in improved efficiency, accuracy and economic benefit.

"Things," in the IoT sense, can refer to a wide variety of devices such as heart monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, DNA analysis devices for environmental/food/pathogen monitoring or field operation devices that assist fire-fighters in search and rescue operations.

These devices collect useful data with the help of various existing technologies and then autonomously flow the data between other devices.

History of IoT

The concept of the Internet of Things first became popular in 1999, through the Auto-ID Center at MIT and related market-analysis publications. R

Radio-frequency identification (RFID) was seen as a prerequisite for the IoT at that point. If all objects and people in daily life were equipped with identifiers, computers could manage and inventory them. Besides using RFID, the tagging of things may be achieved through such technologies as near field communication, barcodes, QR codes, bluetooth, and digital watermarking.

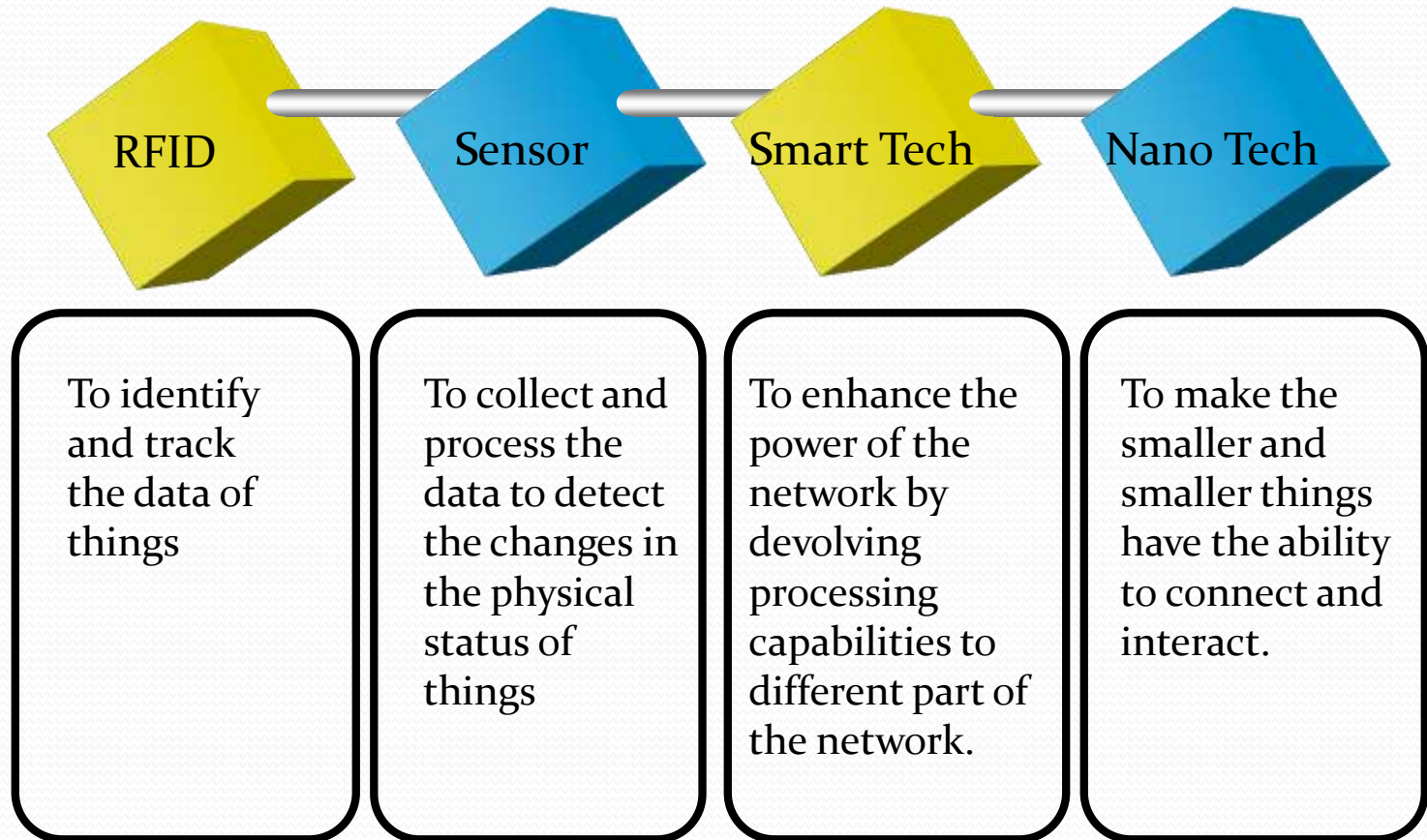
How IoT Works?

Internet of Things is not the result of a single novel technology; instead, several complementary technical developments provide capabilities that taken together help to bridge the gap between the virtual and physical world.

These capabilities include:

- ***Communication and cooperation***
- ***Addressability***
- ***Identification***
- ***Sensing***
- ***Actuation***
- ***Embedded information processing***
- ***Localization***
- ***User interfaces***

How IoT Works?

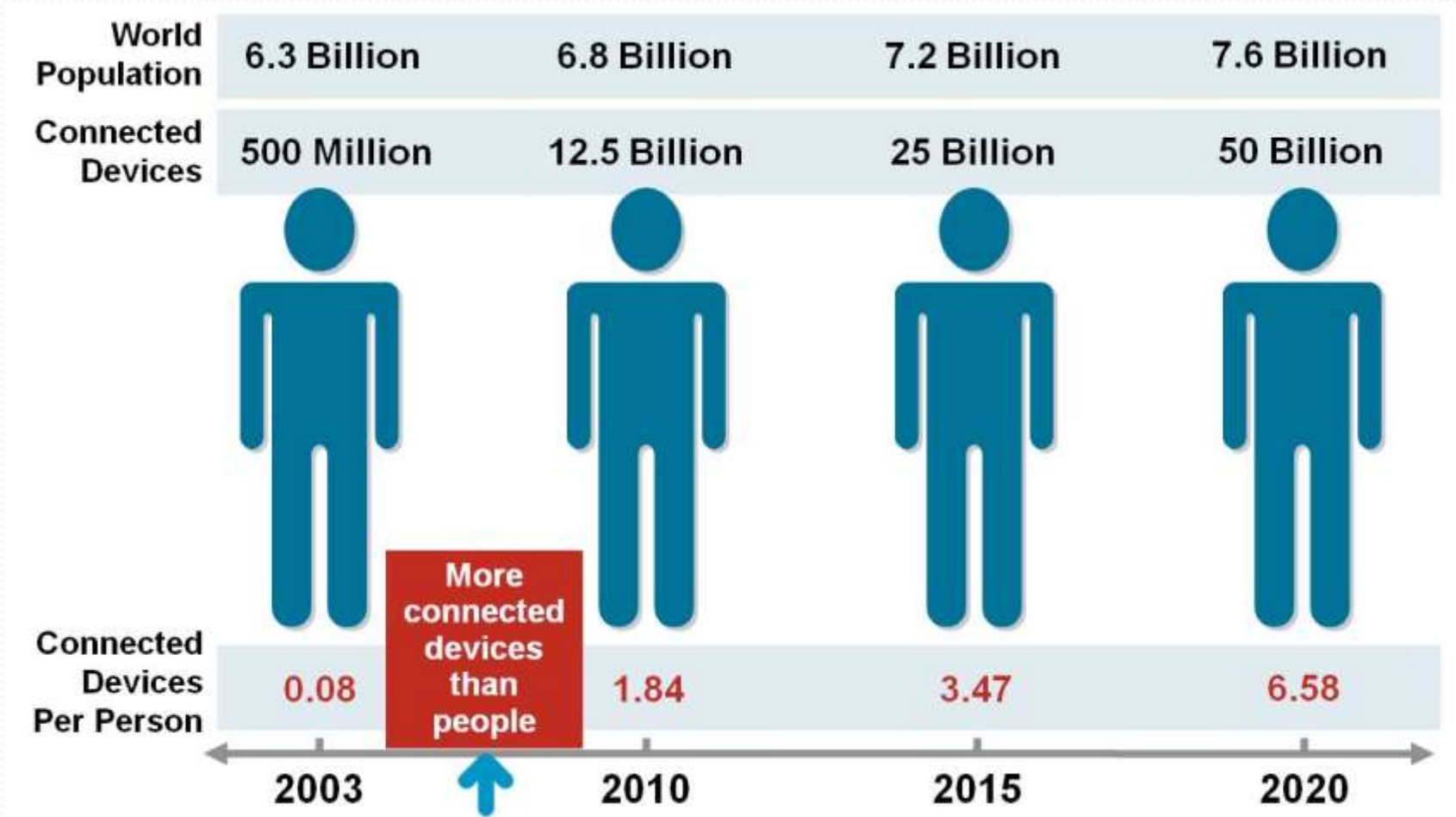


The Structure of IoT

The IoT can be viewed as a gigantic network consisting of networks of devices and computers connected through a series of intermediate technologies where numerous technologies like RFIDs, wireless connections may act as enablers of this connectivity.

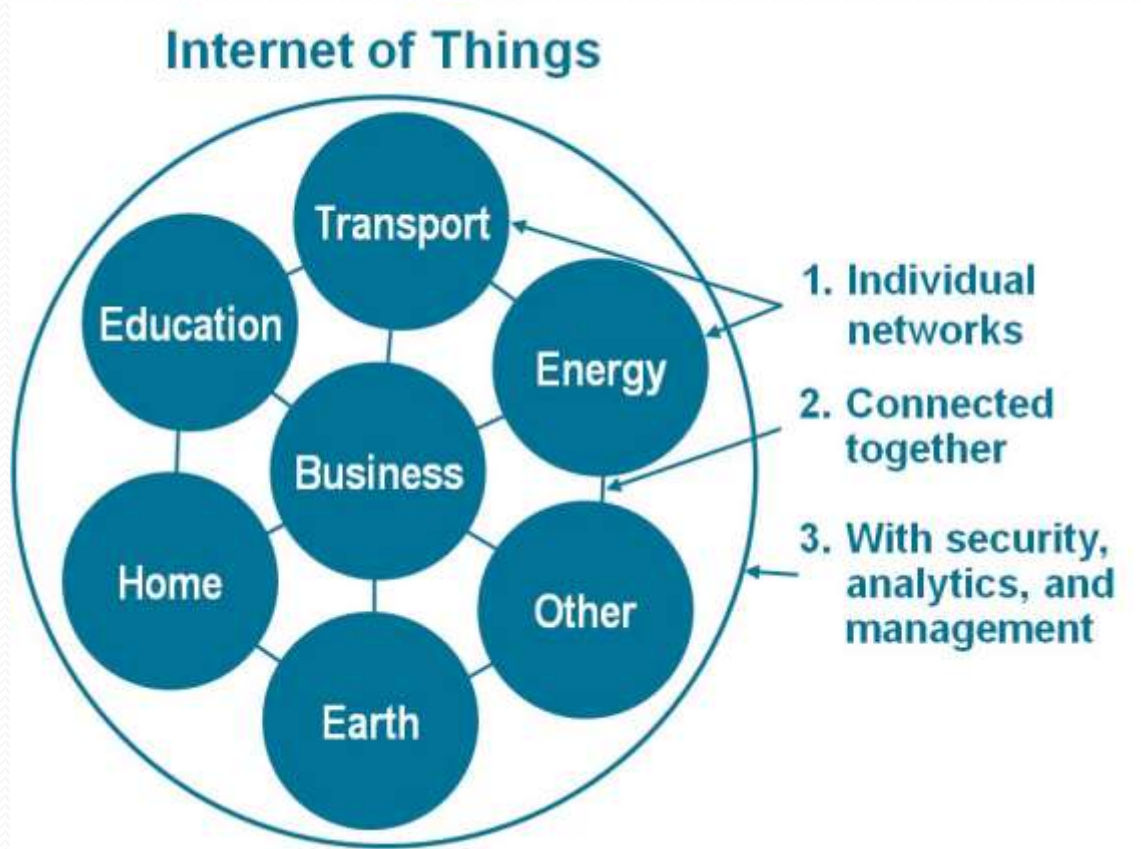
- **Tagging Things** : Real-time item traceability and addressability by **RFIDs**.
- **Feeling Things** : **Sensors** act as primary devices to collect data from the environment.
- **Shrinking Things** : Miniaturization and **Nanotechnology** has provoked the ability of smaller things to interact and connect within the “things” or “smart devices.”
- **Thinking Things** : **Embedded intelligence** in devices through sensors has formed the network connection to the Internet. It can make the “things” realizing the intelligent control.

Current Status & Future Prospect of IoT



“Change is the only thing permanent in this world”

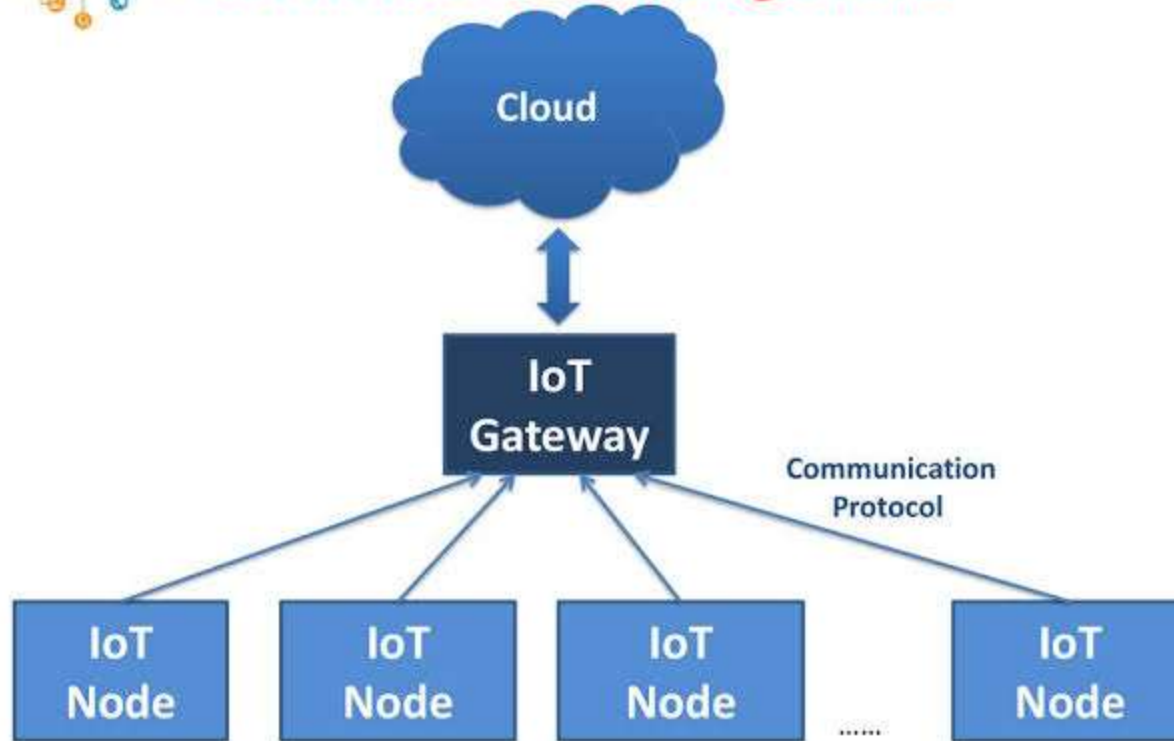
IoT as a Network of Networks:



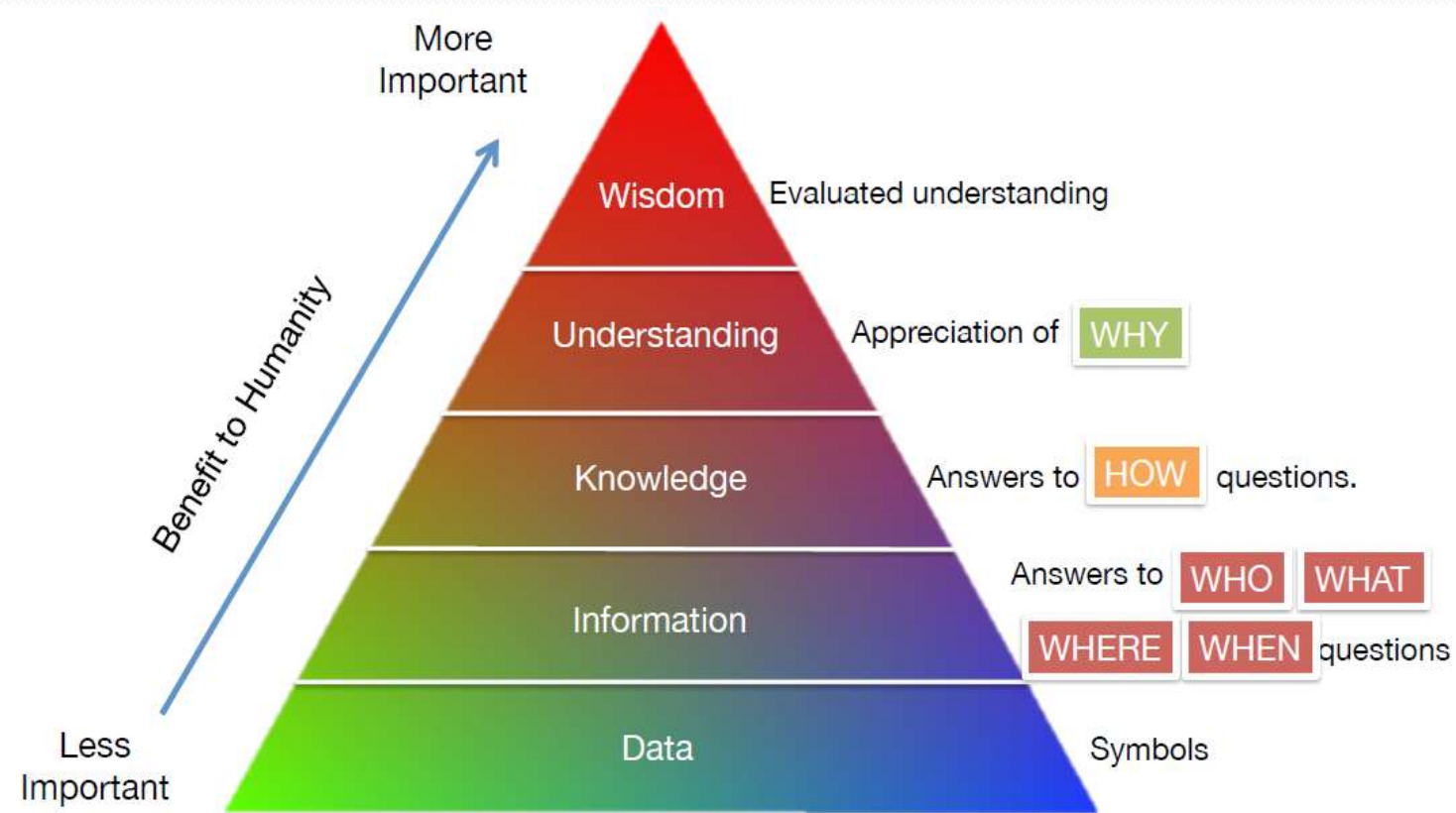
These networks connected with added security, analytics, and management capabilities. This will allow IoT to become even more powerful in what it can help people achieve.



IoT Networks Building blocks



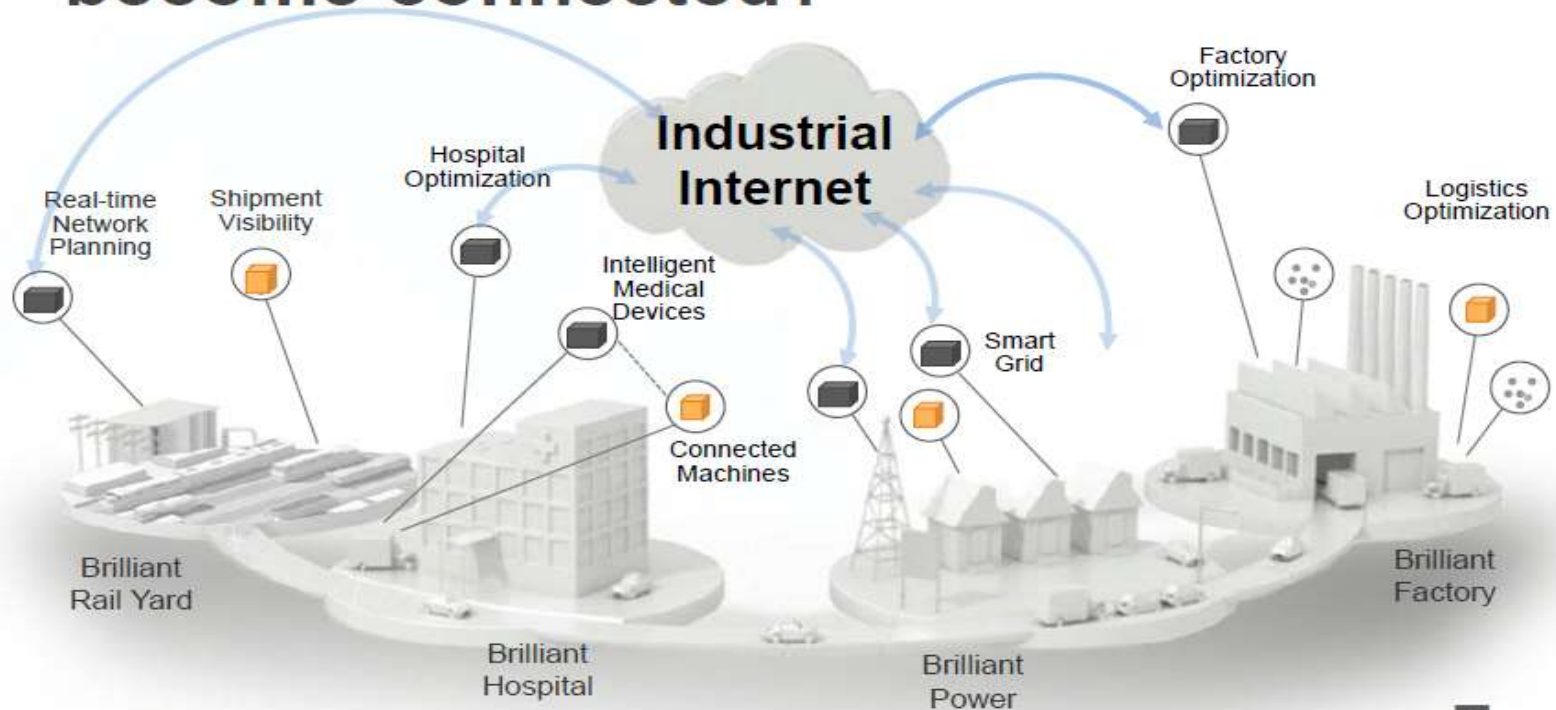
Knowledge Management – Turning Data into Wisdom



The more data that is created, the better understanding and wisdom people can obtain.

The Future of IoT

What happens when 50B Machines become connected?



OT is virtualized..... Analytics become predictive..... Employees increase productivity
Machines are self healing & automated..... Monitoring and maintenance is mobilized



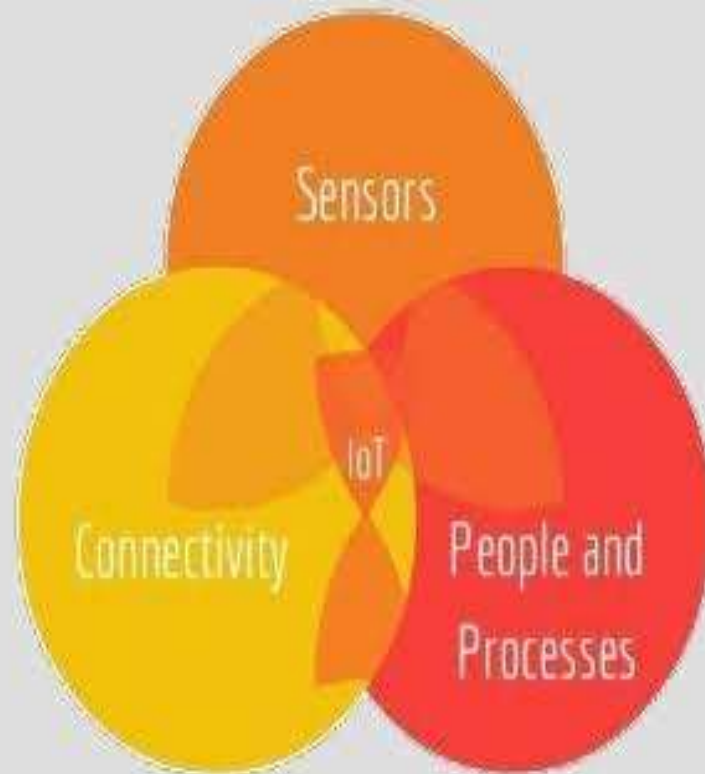
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"The Sky's not the limit. It's only the beginning with IoT."

Components of IoT

Smart Systems and Internet of Things are driven by a combination of :

- 1) Sensors
- 2) Connectivity
- 3) People & Processes



Few Applications of IoT

- ✓ Building and Home automation
- ✓ Manufacturing
- ✓ Medical and Healthcare systems
- ✓ Media
- ✓ Environmental monitoring
- ✓ Infrastructure management
- ✓ Energy management
- ✓ Transportation
- ✓ Better quality of life for elderly
- ✓

You name it, and you will have it in IoT!

Sensors in even the holy cow!

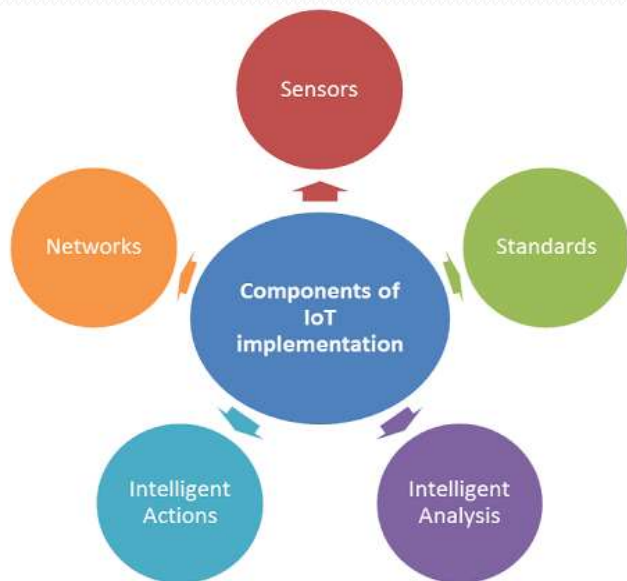


In the world of IoT, even the cows will be connected and monitored. Sensors are implanted in the ears of cattle. This allows farmers to monitor cows' health and track their movements, ensuring a healthier, more plentiful supply of milk and meat for people to consume. On average, each cow generates about 200 MB of information per year.

TECHNOLOGICAL CHALLENGES OF IoT

At present IoT is faced with many challenges, such as:

- Scalability
- Technological Standardization
- Inter operability
- Discovery
- Software complexity
- Data volumes and interpretation
- Power Supply
- Interaction and short range communication
- Wireless communication
- Fault tolerance

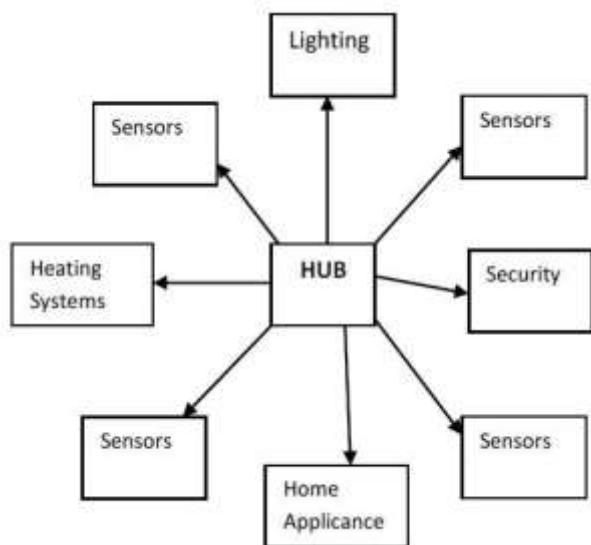


Driver Technologies

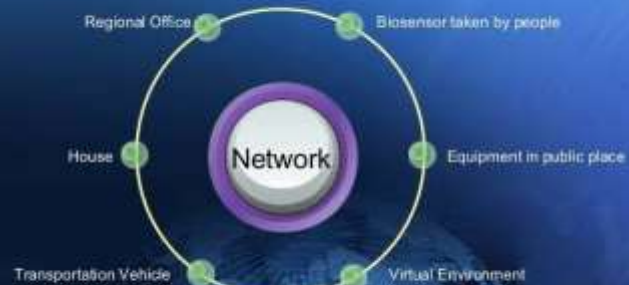


Internet of Things - A Smart Planet Future

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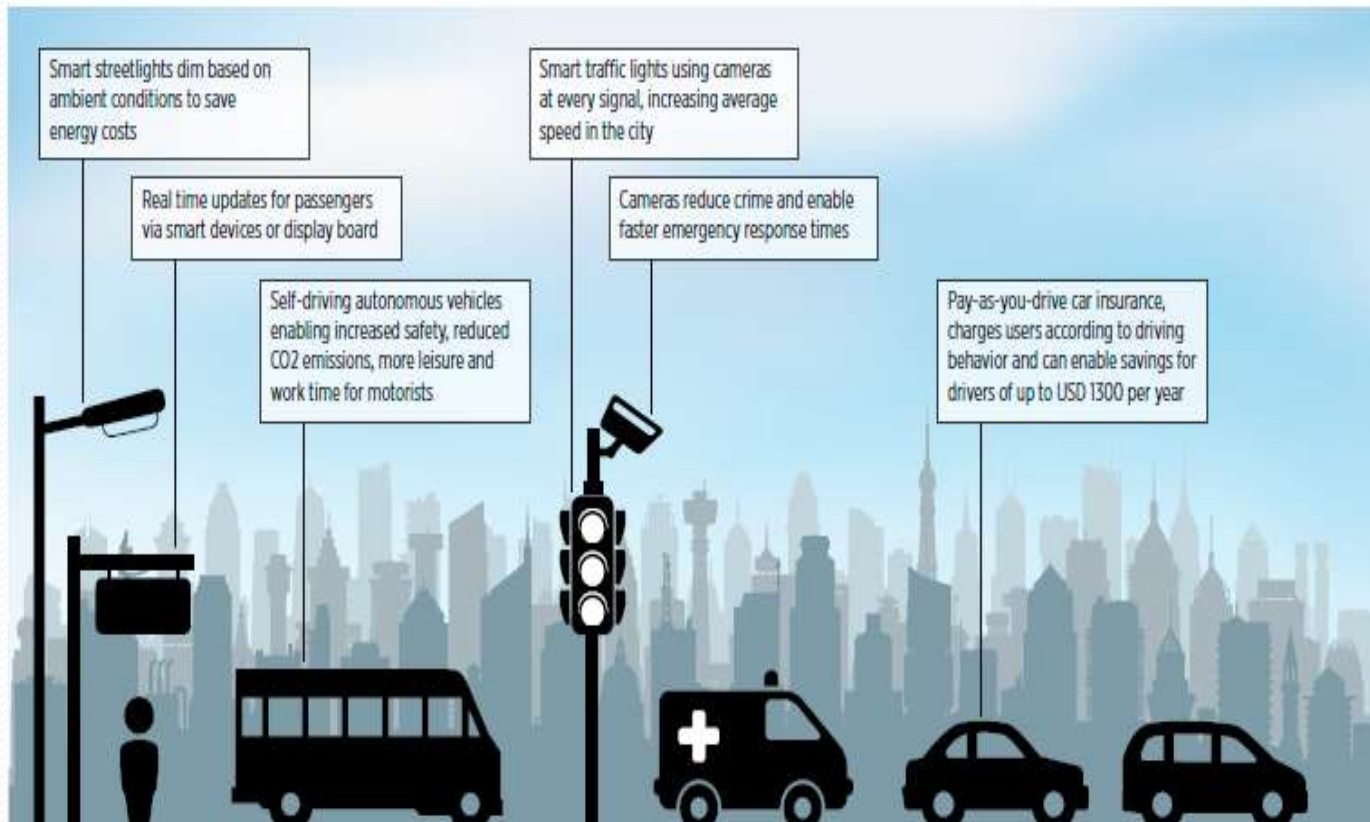


The application of IoT(1)



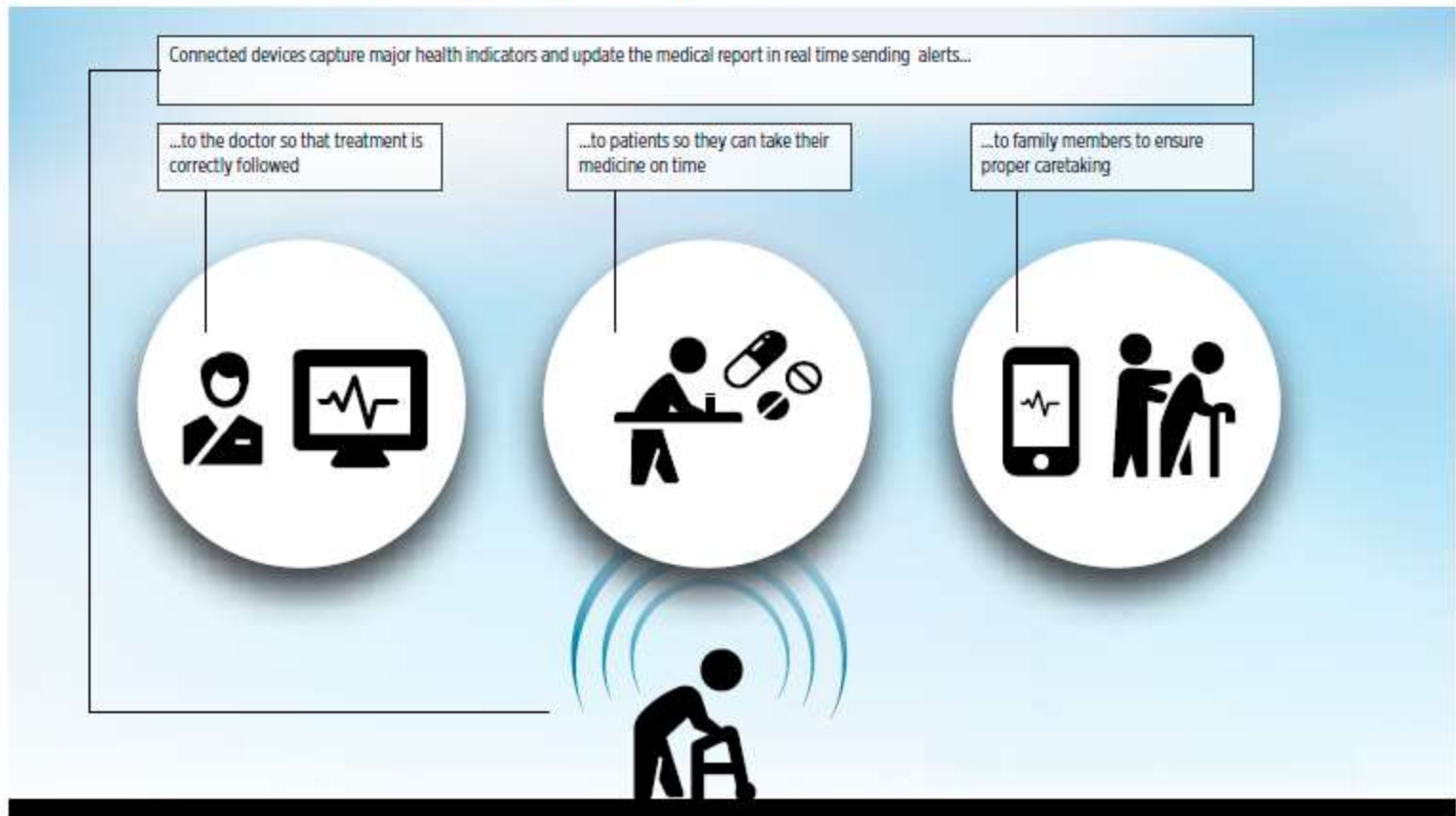
UNDERSTANDING THE INTERNET OF THINGS (IOT)

FIGURE 6: EXAMPLE IOT SMART CITIES APPLICATIONS



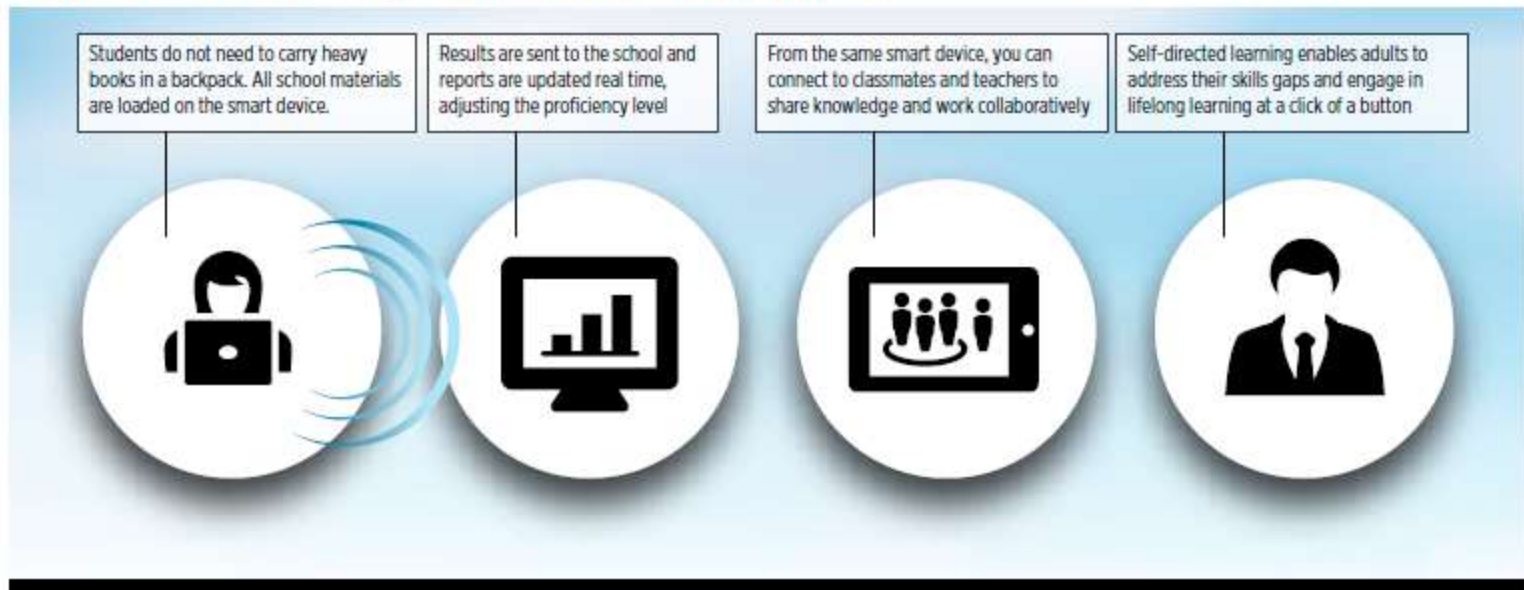
UNDERSTANDING THE INTERNET OF THINGS (IOT)

FIGURE 7: EXAMPLE IOT HEALTH APPLICATIONS



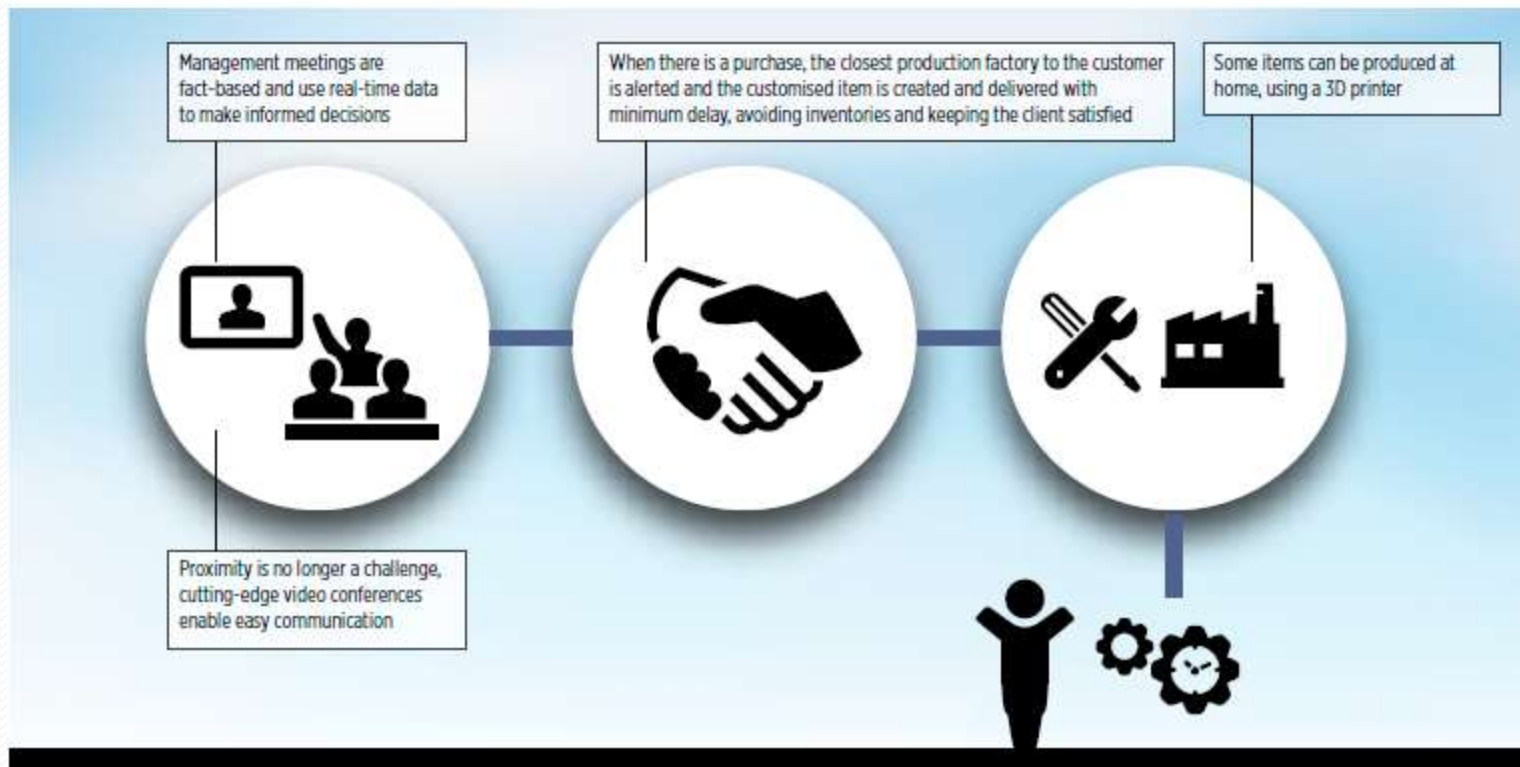
UNDERSTANDING THE INTERNET OF THINGS (IOT)

FIGURE 8: EXAMPLE IOT EDUCATION APPLICATIONS



UNDERSTANDING THE INTERNET OF THINGS (IOT)

FIGURE 9: EXAMPLE IOT PRODUCTIVITY APPLICATIONS



Conclusion

Projections for the impact of IoT on the Internet and economy are impressive, with some anticipating as many as 100 billion connected IoT devices and a global economic impact of more than \$11 trillion by 2025.

The potential economic impact of IoT is huge, but the journey to IoT adoption is not a seamless one. There are many challenges that face companies looking to implement IoT solutions. However, the risks and disadvantages associated with IoT can be overcome.



"The next logical step in the technological revolution connecting people anytime, anywhere is to connect inanimate objects. This is the vision underlying the **Internet of things: anytime, anywhere, by anyone and anything**" - ITC

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THANK YOU

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