

"Future Internet: The Internet of Things Architecture, Possible Applications and Key Challenges"

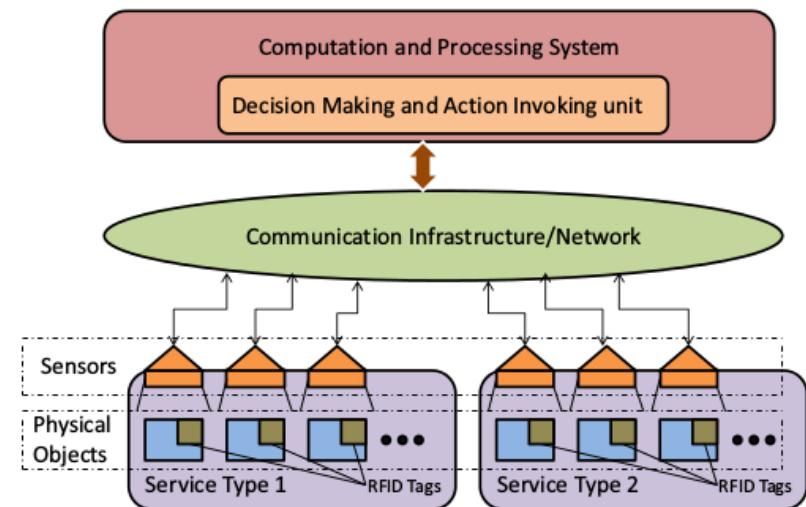
Khan, R., Khan, S.U.,
Zaheer, R., and Khan, S.

Overview of the paper

- Evaluation of Internet of Things
- Generic Architecture
- Possible Future Applications
- Key Challenges

Evaluation of Internet of Things

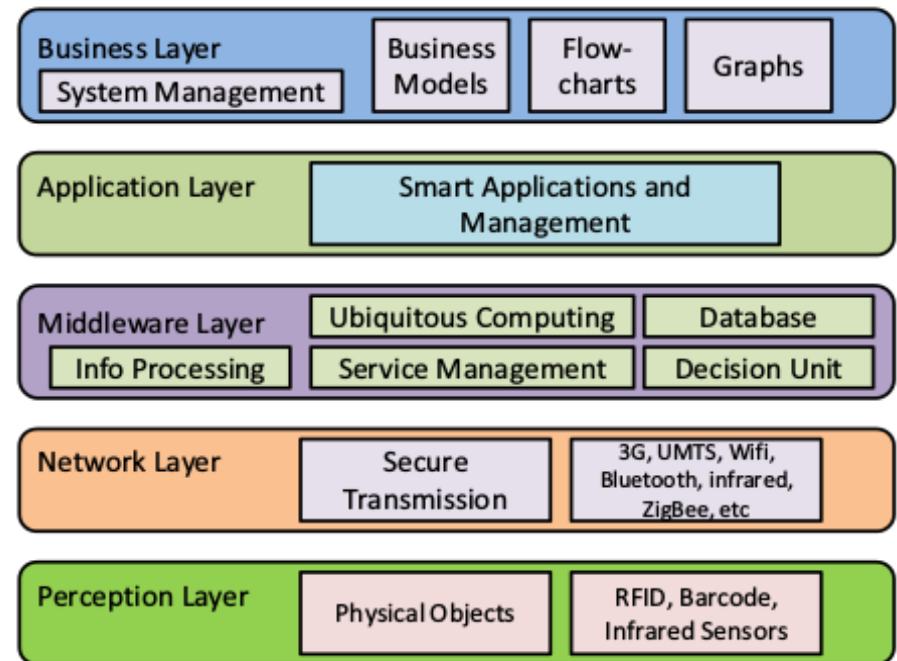
- More Internet connected devices
- Generic scenario of IoT
- Increased processing power and storage capability, reduced size
- Equipped with ID tags
- Basic Work Flow:
 - 1) Object sensing
 - 2) Action triggering
 - 3) System provides feedback



Generic architecture

- More traffic and data, need more storage.
- Privacy and security
- New proposed architecture requires scalability, reliability, interoperability, QoS, etc..

- General structure of IoT:



Possible future applications

- Prediction of natural disasters
- Water Scarcity monitoring
- Medical applications
- Industry applications
- Design of smart homes/cities
- Etc.
- Increased popularity for academia, government and industry
 - Microsoft's Eye-On-Earth
 - European FP7's IoT-A (*Internet of Things Architecture*)
 - HP research in their Central Nervous System for the Earth initiative.
 - The European Commission's CERP-IoT (*The Cluster of European Research Projects on the Internet of Things*)

Key Challenges

- Billions of objects
 - Large traffic and more storage needed
 - Unique IDs
- Privacy and security
 - Information privacy
 - Objects' safety
 - Data confidentiality and encryption
 - Network security
- New proposed architecture
 - Scalability
 - Interoperability and standardization
 - Reliability
 - QoS
- Developments depends on technology progress and design of new applications and business models.

Key findings

- Making a bigger picture of the future of IoT by using others' findings
- This is IoT, this is how it works in general, this is what we can develop with it, and these are the challenges.

Strengths and weaknesses

- Examples, maybe too many?
- Short explanations
- Picture examples with little or no explanation
- Bigger picture, but not going into the depths

IV. POSSIBLE FUTURE APPLICATIONS

The IoT can find its applications in almost every aspect of our daily life. Below are some of the examples.

1) *Prediction of natural disasters*: The combination of sensors and their autonomous coordination and simulation will help to predict the occurrence of land-slides or other natural disasters and to take appropriate actions in advance.

2) *Industry applications*: The IoT can find applications in industry e.g., managing a fleet of cars for an organization. The IoT helps to monitor their environmental performance and process the data to determine and pick the one that need maintenance.

3) *Water Scarcity monitoring*: The IoT can help to detect the water scarcity at different places. The networks of sensors, tied together with the relevant simulation activities might not only monitor long term water interventions such as catchment area management, but may even be used to alert users of a stream, for instance, if an upstream event, such as the accidental release of sewage into the stream, might have dangerous implications.

4) *Design of smart homes*: The IoT can help in the design of smart homes e.g., energy consumption management, interaction with appliances, detecting emergencies, home safety and finding things easily, home security etc.

5) *Medical applications*: The IoT can also find applications in medical sector for saving lives or improving the quality of
