

World Standards Day

Technical Report

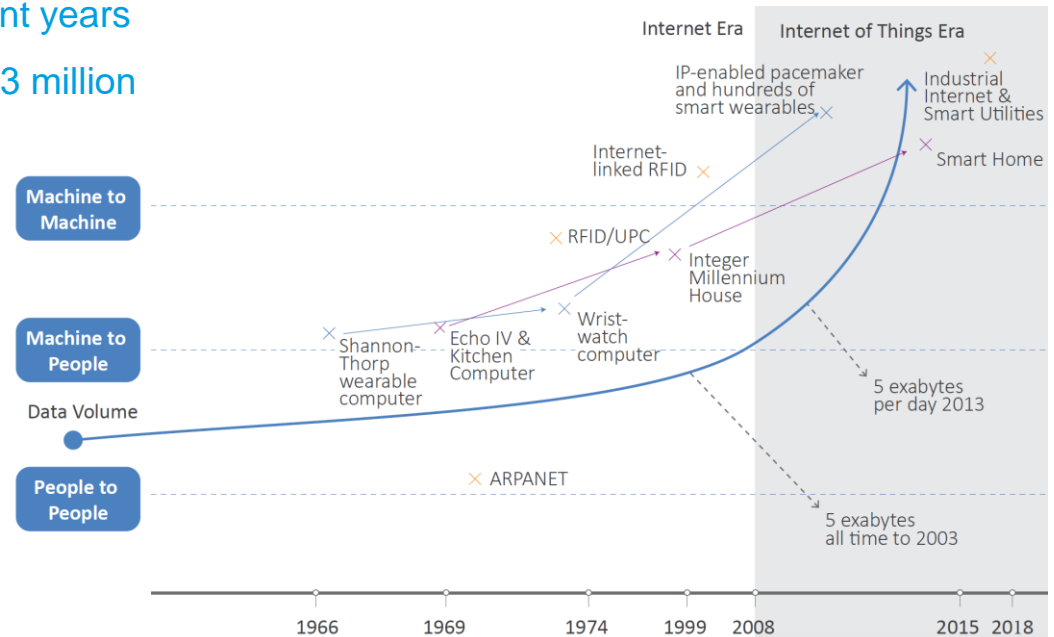
Internet of Things (IoT)

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Internet of Things

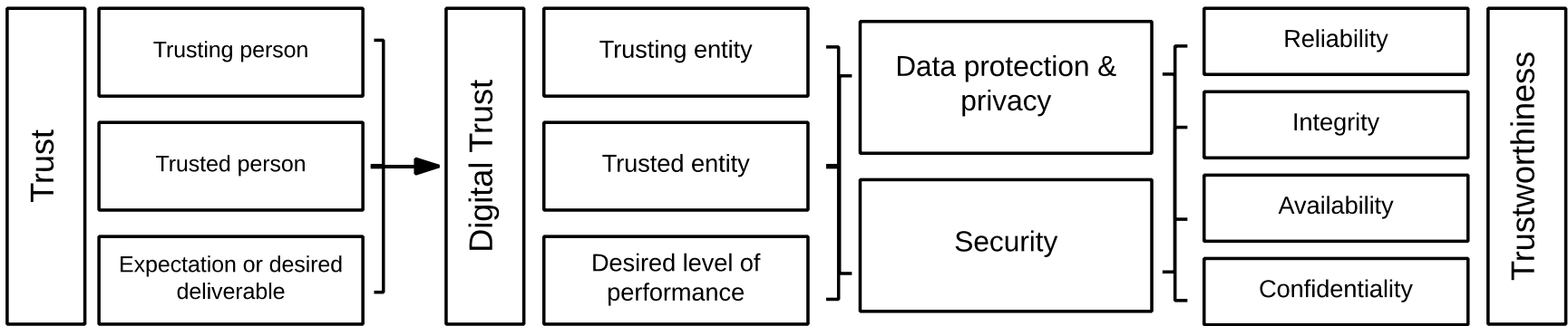
- Europe responsible for 39% of global IoT market
- €366 billion out of €939 billion in 2014
- €1.2 trillion out of €3 trillion in 2020
- 6 billion connected devices and growing
- Data protection and privacy a significant concern
- Cybersecurity attacks double over recent years
- Average cost of data breach exceeds €3 million



Data volume changes with development in communication technology - Source: ITU

Trustworthiness in IoT

From Trust to Trustworthiness



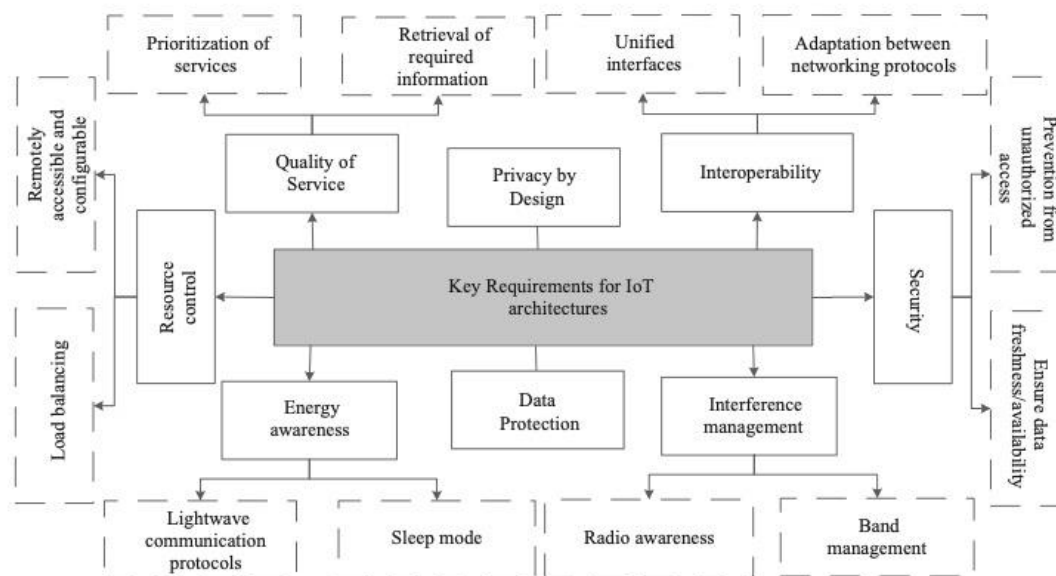
"The affirmative confidence of an entity in the integrity of an IoT system, the sureness of the honesty and accuracy of devices and reliability and confidentiality of digital information and networks on both levels of interaction; user-and-machine as well as machine to-machine; where an entity could be a human user, digital device, IoT subsystem or software agent."



Data Protection and Privacy

Research and Technical Standardization

Survey on state of the art in research



Data Protection and Privacy

Research and Technical Standardization

Data Protection, Privacy and Security in IoT

- Review and analysis on technical standardization landscape
- Identification of main comparison pillars
 - *Terminology,*
 - *Interoperability,*
 - *Reference Architecture,*
 - *Trustworthiness*
- Illustrative use-case developed throughout report



Gap Analysis

Structure of IoT Analysis

- Identify the goal or ideal state of IoT
- Analyze and compare the states of research and standardization for:
 - *IoT Terminology*
 - *IoT Interoperability*
 - *IoT Reference Architecture*
 - *Trustworthiness in IoT*
- Describe the gap and attempt to quantify them
- Summarize the suggestions to bridge the gaps



Gap Analysis

Goal

Enable governments, organizations, individuals and other stakeholders to utilise IoT to ideally its full potential.

This can be achieved by:

- lowering barriers to entry for new market comers,
- enabling fair competition and
- encouraging the introduction of new value-added services to benefit the society

All without violating individuals' right of privacy and data protection.

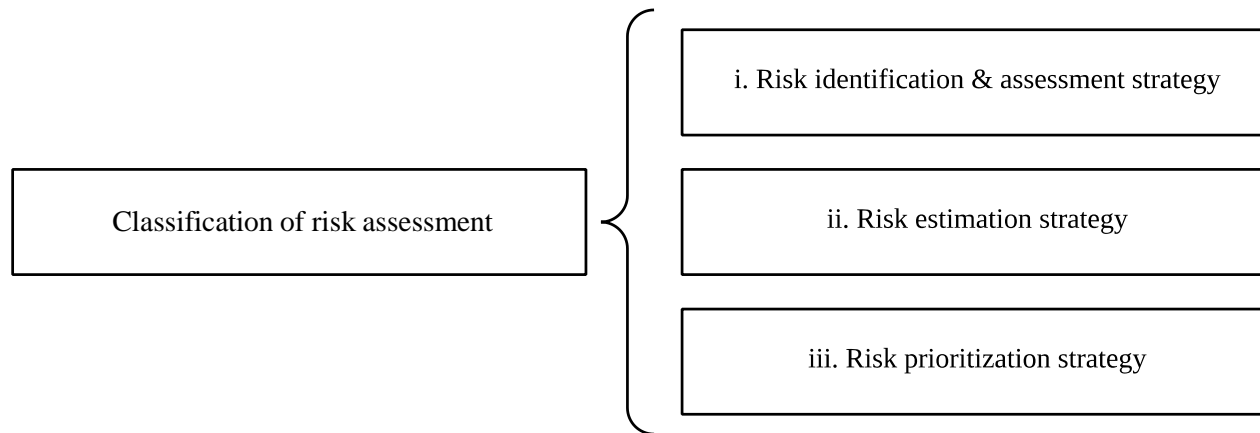


Gap Analysis

Risk Assessment

For organizations to place strategic roadmaps they in turn have to:

- accurately assess their current status,
- evaluate their products in market,
- perform risk assessment audits.



Summary

Terminology

- Research suffers lack of harmonization
- Standards lack some key terminology due to the rapid technology evolution

Interoperability

- Fragmentation of research due to the large number of communication protocols and network technologies
- Incomplete or insufficient IoT-dedicated interoperability standards

Reference Architecture

- Research provides multiple solutions however duplication require harmonization and consensus
- Published standards need updating to embrace the rapid technological changes

Trustworthiness

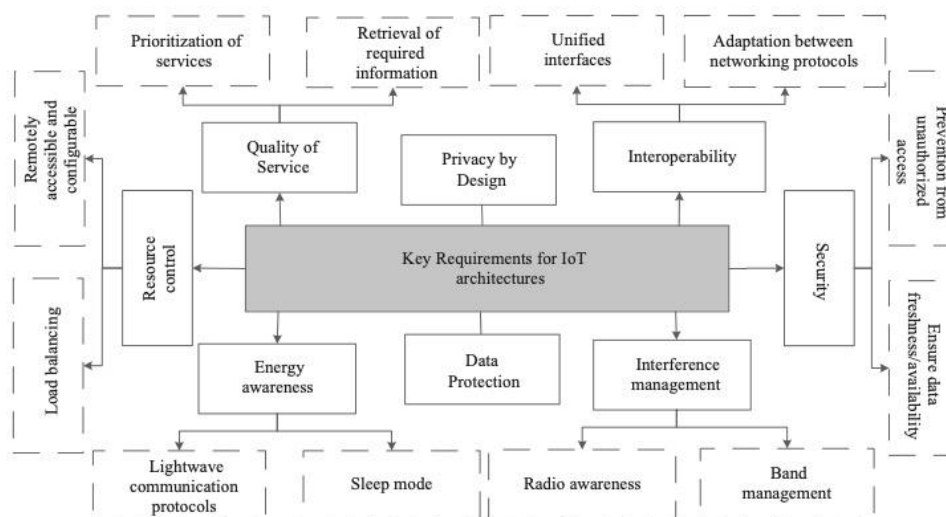
- Standardization shows lack of IoT-specific standards while adoptable IT standards need harmonization
- Research indicates that privacy and security issues are key blocking factors for users' acceptance



Data Protection and Privacy

Research and Technical Standardization

Data Protection, Privacy and Security in IoT



- Survey on state of the art in **research** and **technical standardization**
- Identification of main comparison pillars
- Illustrative use-case developed throughout report

