

Agenda

- Concept/definition of the Internet of Things
- What future trends will affect the Internet of Things
- Key features, enablers and principles for a vision of the Internet of Things
- Recommendations/next steps

A multifaceted concept

- Focus on identity: **Things** themselves having **identities** and a virtual personality”
- Focus on **seamless integration** into the **information network** where objects have an **active role**
- Focus on **connecting** objects and **active** citizen **participation** rather than passive recipients of services and products.
- There is not one Internet of Things but also **Networks of Things**, or even **Intranet of Things**.
The definition depends very much from the aspect/angle examined an overall comprehensive view should be sought



- The **Internet of Things** will involve **different** technologies, not only **RFID**
 - Functionalities include: localization, sensing, identification, networking, processing and security

- The Internet of Things might mean different things in other **parts of the world**

- **Citizens, consumers, individuals governments, communities and businesses will shape** the Internet of Things from a technical, societal, and applications perspective

- **Connectivity, applications, integration** and the availability to **communicate between objects** are essential components to the Internet of Things

- We cannot predict the most useful **applications** and use cases today but we can **classify** applications and name a few expected ones, according to **societal, economic demographic** trends
- **A possible classification of applications:**
 - Object centric applications at serial and class levels
 - Location centric applications
- **Some selected applications**
Emergency assistance, healthcare applications, efficient energy use
- “Technology push ” (offer) and demand pull
- User generated applications and values

Trends /needs 2030

Demographic trends

Single household
Ageing population
Multicultural issues
Geographical dispersion of families
Migration

Socioeconomic trends

Scarcity of Energy resources
Changing patterns of Employment
Lack of human resources
New business models
Increased globalization

Health & Environment trends

Chronic diseases
Climate change
Product & people safety
Increase of natural Disasters

National security

Challenging aspects towards innovative applications

Visions are forward looking but **development of applications need to have a future proof framework** in which existing a new applications will be offered to users, whether business consumers or individuals.

The desired features of the Internet of Things need to be spelled out, examined as a **method** to identify Research needs.

These features are considered **essential enablers for innovation** towards the Internet of Things.

These **features** are also intrinsically related to existing and future **applications** as part of the Internet of Things.

An environment that fosters **innovation** will boost the development of new applications.

Key features of the Internet of Things

Centralised & Decentralised mechanisms

Depending of the application and ancillary factors one or the other might be best suited

Identity management: a large number of Identifiers of people/objects/machines will be a reality: need to map how identities will be assigned and how they will link to other objects?

Context – aware applications

Who (authority) and how the context is determined- how and when shared information is used)

Mobility of devices, people and things

Different Quality of services needs to be afforded

Customized , personalized and user friendly applications

- Open standards
- Competition
- Incentives for investment (including IPR)
- Public Private Partnerships
- Interoperability
- Industrial collaboration
- International Cooperation

What are the principles underlining our visions for the internet of Things?

Availability, Choice and participation by individuals

Heterogeneity versus homogeneity

Accountability: who and when is responsible and for what and
Auditability

Trust and confidence

- Organisational and technical measures, assuring the right balance

Security at all layers and according to the specifics of technologies and types of communication involved

Affordability

- Cost structure
- Competition
- Open standards
- Patent issues

Predictability

Resilience: ability to respond to failure and disruption

Scalability: large amounts of information and messages

- Just do it and learn from feedback: pilots, customer feedback..

- Trust is a key topic

- Actions
 - Research on previously listed priorities
 - Public education
 - Fostering Enablers