

# 유럽 FP7 미래인터넷 서비스 연구 동향

- The Future of the Internet -

김병오

KAIST

2011.09.08

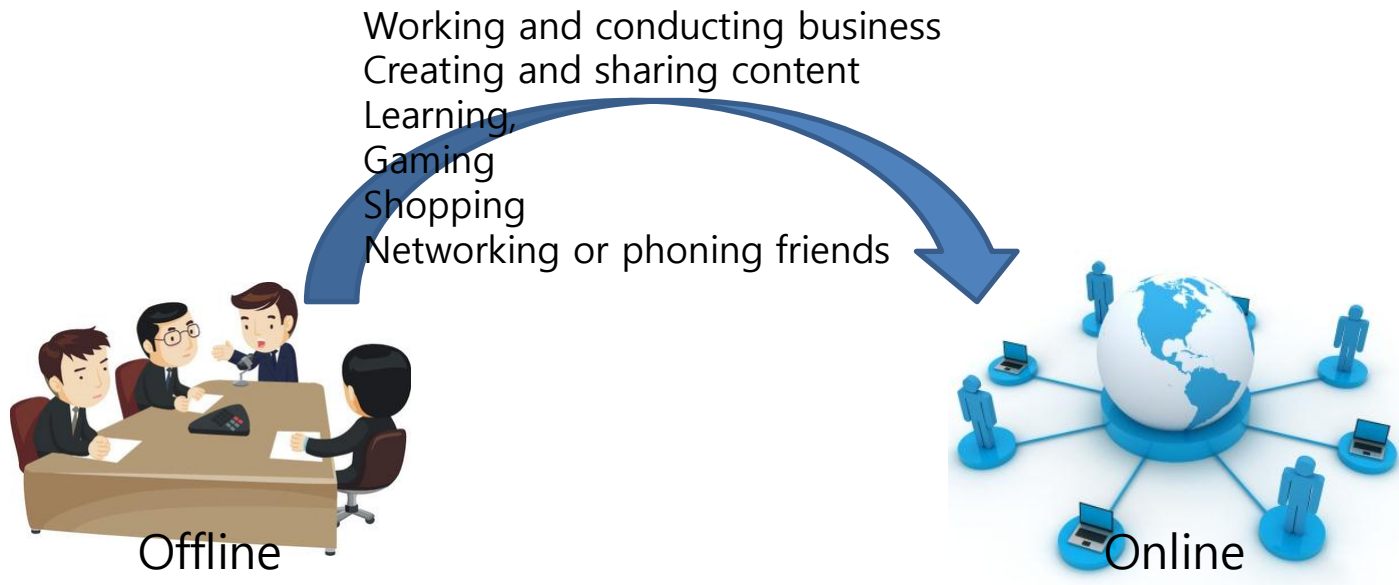
# 목차

- 개요
- FP7 최근 연구 동향
- Summary
- Discussion

# 개요

- The Future of the Internet

- 유럽 Information Society의 미래인터넷 분야 연구 활동
- Future vision



- Web site:

[http://ec.europa.eu/information\\_society/activities/foi/index\\_en.htm](http://ec.europa.eu/information_society/activities/foi/index_en.htm)

# 개요

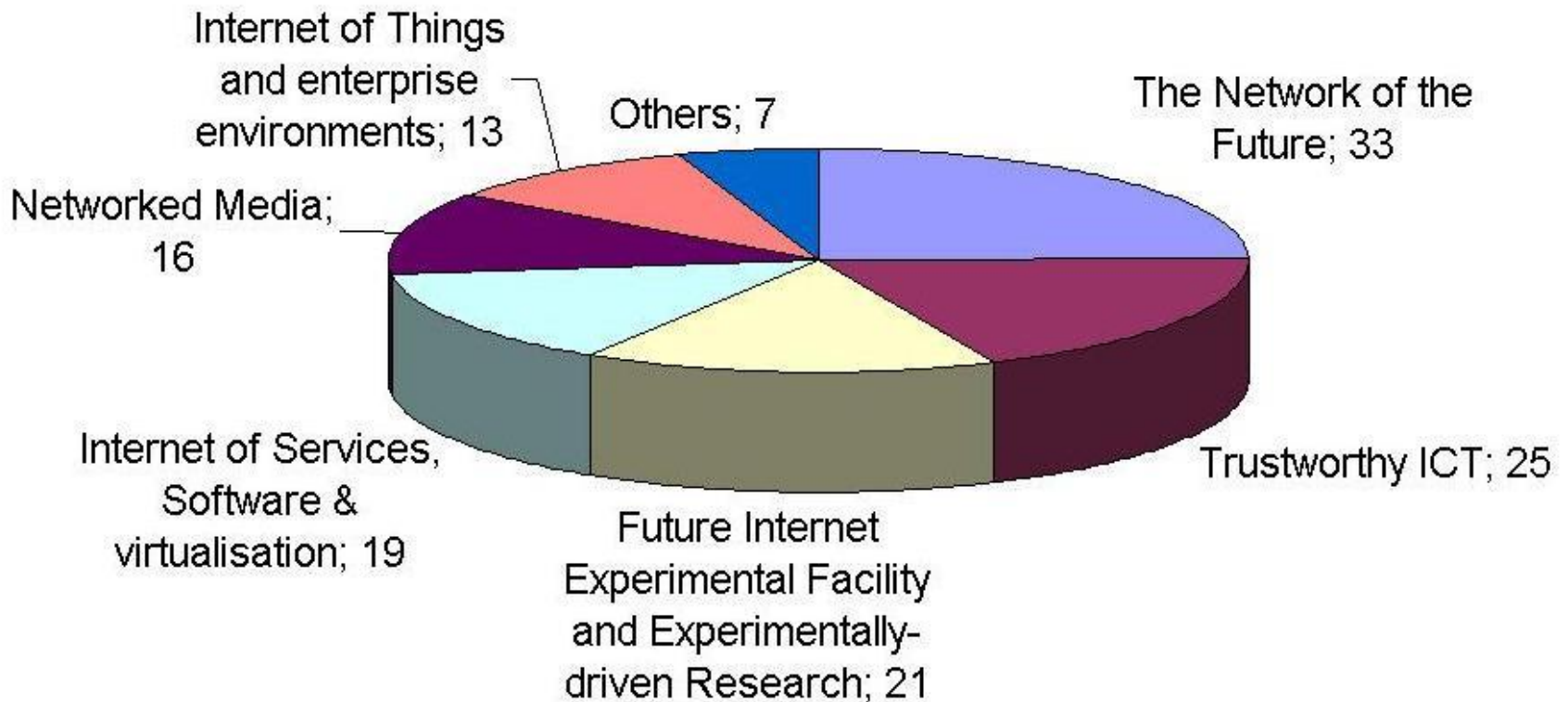
- Opportunity
  - Bringing more growth & jobs:  
increased productivity, new services, increased trade and, overall,  
more growth and jobs
  - Getting connected anywhere, anytime and any way:  
community of billions of mobile device users
  - Empowering you through networking and sharing:  
Social networking, crowd sourcing, mass collaboration
  - Improving government services:  
residence and work permits, file tax returns
  - Learning anytime, anywhere:  
better access to educative content
  - Having more fun:  
3D virtual worlds
  - Making your life easier:  
learning and adapting to different types of information
  - Supporting your lifestyle:  
access services using the most convenient device

# 개요

- Challenges
  - Increasing the Internet's capacity
    - More addresses, storage and transport capacity, Making technology compatible
  - Making the Internet more user-friendly
    - Better search tools, From data to knowledge, Deploy the Internet of Services, Internet for all
  - Making the Internet safe and trustworthy
    - hacking, phishing and other cybercrimes

# FP7 Projects

137 projects funded by EU



출처: European research - FIA Projects,

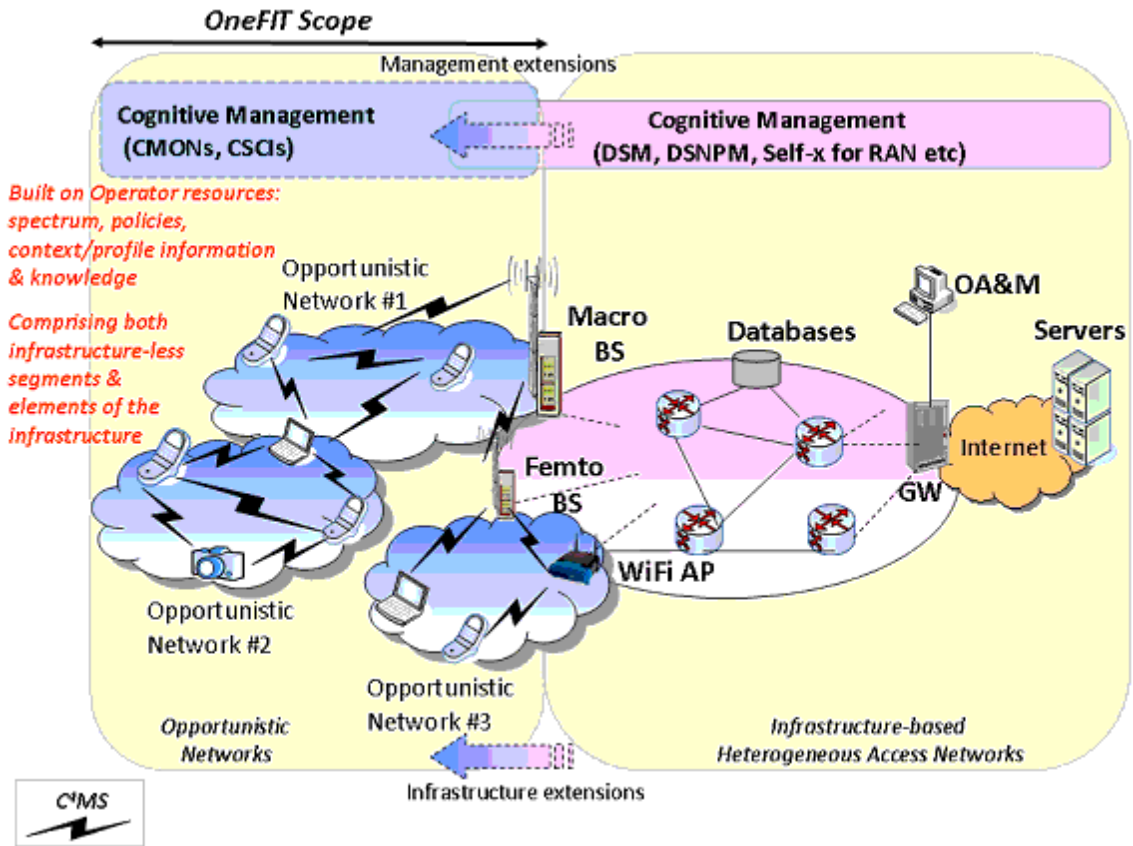
[http://ec.europa.eu/information\\_society/activities/foi/research/fiaprojects/index\\_en.htm](http://ec.europa.eu/information_society/activities/foi/research/fiaprojects/index_en.htm)

2010.07.01~현재

# FP7 최근 연구 동향

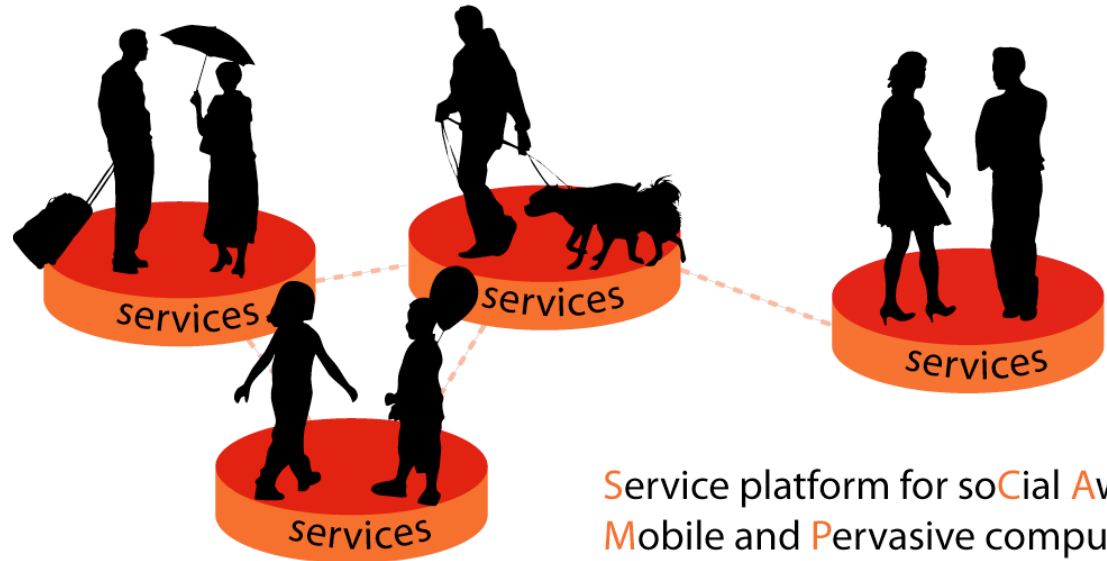
# Opportunistic networks and Cognitive Management Systems for Efficient Application Provision in the Future Internet (OneFIT)

- Coordinator
  - WATERFORD INSTITUTE OF TECHNOLOGY
- Budget
  - 6,770,000 in Euro (10 billion won)
- Duration
  - From 2010-07-01 to 2012-12-31
- Objective
  - design, develop and validate the concept of applying opportunistic networks and respective cognitive management systems for efficient application/ service/ content provisioning in the Future Internet
- Proposed Solution
  - Opportunistic Networks
  - Cognitive Management System
  - Control Channels for the Cooperation of the Cognitive Management System



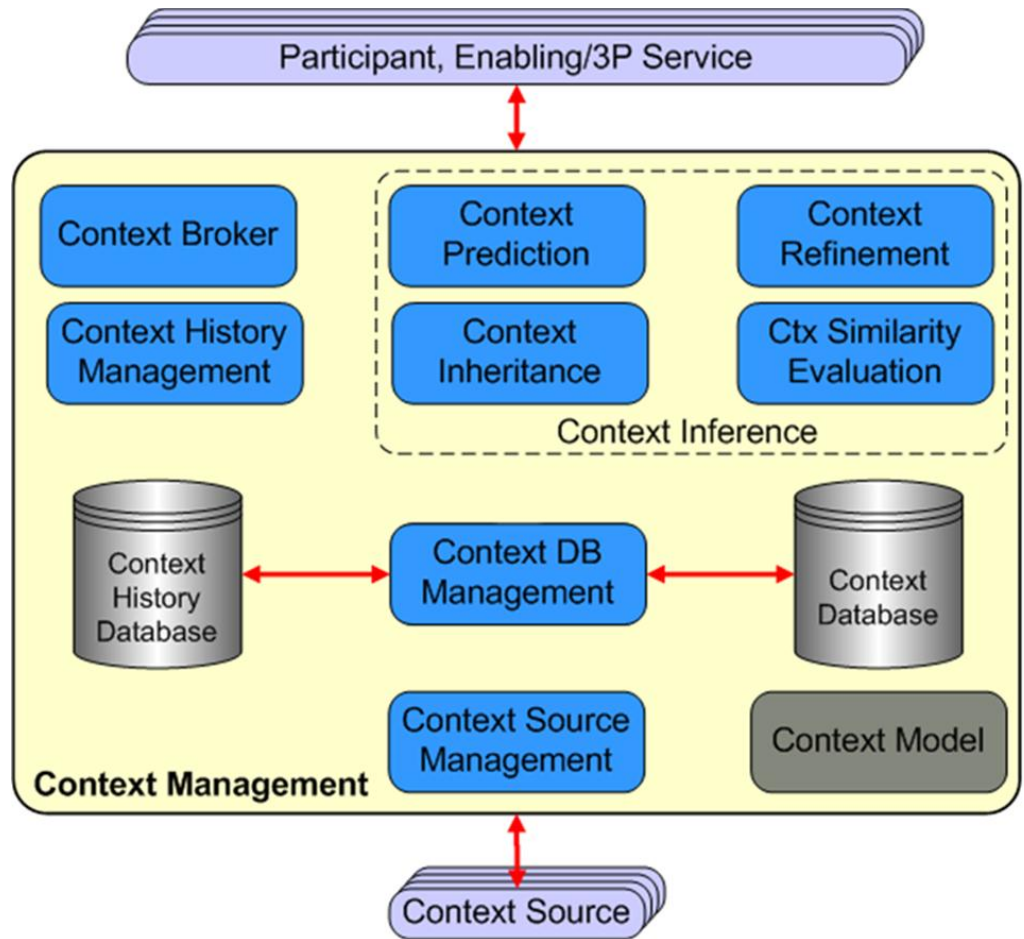
# Service platform for social Aware Mobile and Pervasive computing (SCAMPI)

- Coordinator: AALTO-KORKEAKOULUSAATIO
- Budget: 3,640,000 in Euro (funding: 2.76 million, 5.4 billion won)
- Duration: From 2010-10-01 to 2013-09-30
- Objective
  - to empower end users through a combination of pervasive and opportunistic networking capabilities for a more effective access to a variety of services in a secure manner
- Key idea
  - collaborative ways to enable shared services by exploiting in an opportunistic way hardware and software resources embedded and accessible within the environment



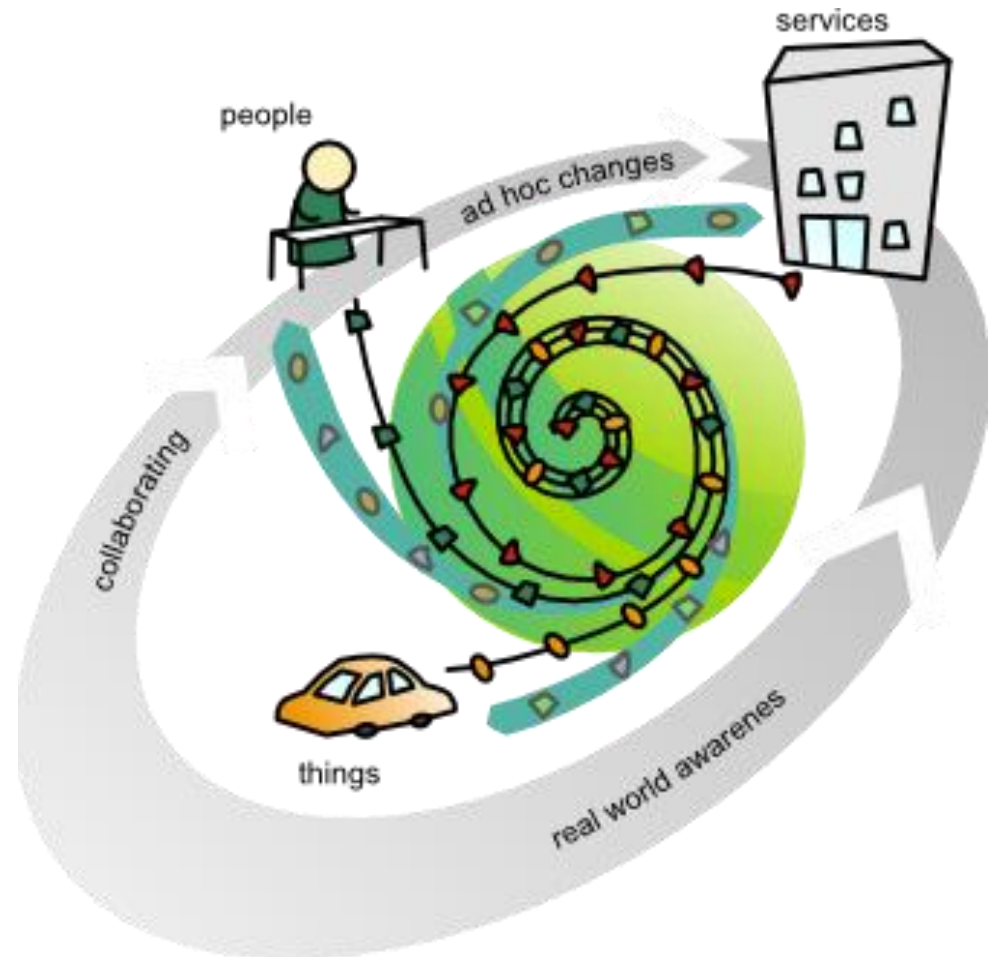
# Self Orchestrating Community ambiEnt Intelligence Spaces (SOCIETIES)

- Coordinator: WATERFORD INSTITUTE OF TECHNOLOGY
- Budget: 15,840,000 in Euro (funding: 10.6 million, 23.7 billion won)
- Duration: From 2010-10-01 to 2013-09-30
- Objective
  - Develop a complete integrated solution that extends pervasive systems beyond the individual to dynamic communities of users
- Proposed Solution
  - Community context modeling, management and inference
  - Community context sharing and context inheritance in hierarchical communities
  - Dynamic community creation/deletion and membership management based on context similarities
  - History of community context management and exploitation
  - Community context refinement and prediction



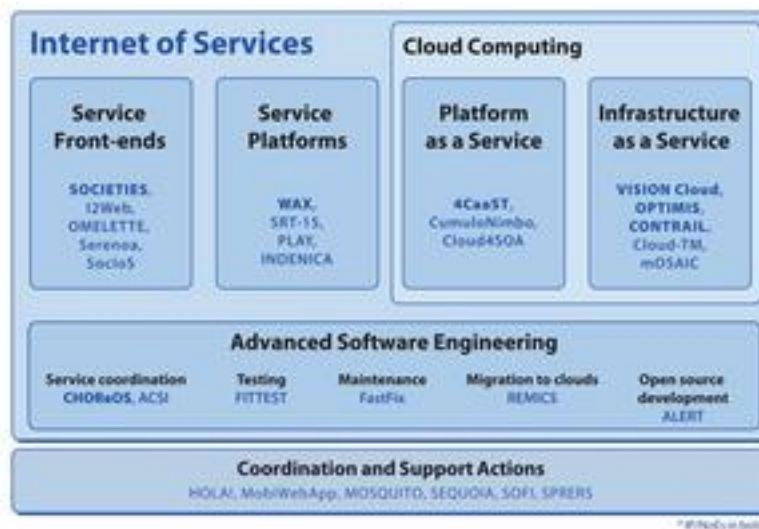
# Pushing dynamic and ubiquitous interaction between services Leveraged in the Future Internet by Applying complex event processing (PLAY)

- Coordinator: FORSCHUNGSZENTRUM INFORMATIK AN DER UNIVERSITÄT KARLSRUHE
- Budget: 4,010,000 in Euro (6 billion won)
- Duration: From 2010-10-01 to 2013-09-30
- Objective
  - provide an open highly distributed Platform for event-driven interaction between services that scales at the Internet level based on a federated architecture
- Solutions
  - Federated middleware layer with p2p overlay network
  - Distributed Complex event processor to detecting interesting situation
  - Dynamic subscription and service adaptations
  - Piloting and validating results in use cases



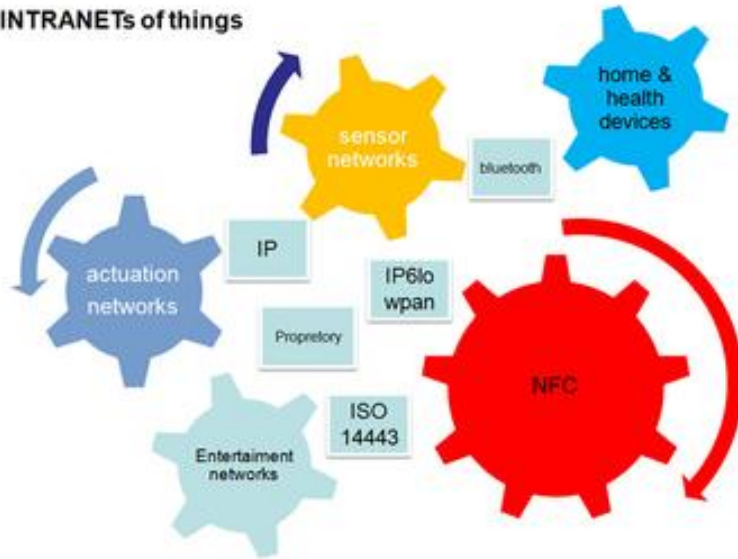
# Virtualized Storage Services Foundation for the Future Internet (VISION CLOUD)

- Coordinator: IBM ISRAEL - SCIE NCE AND TECHNOLOGY LTD
- Budget: 15,670,000 in Euro
- Duration: From 2010-10-01 to 2013-09-30
- Objective
  - Develop an architecture and a reference implementation of a cloud-based infrastructure, built on open standards and new technologies, to provide a scalable, flexible and dependable framework for optimised delivery of data-intensive storage service
- Solutions
  - Raising the Abstraction Level of Storage
  - Data Mobility and Federation without Boundaries
  - Computational Storage
  - Content Centric Storage
  - Advanced Capabilities for Cloud-Based Storage

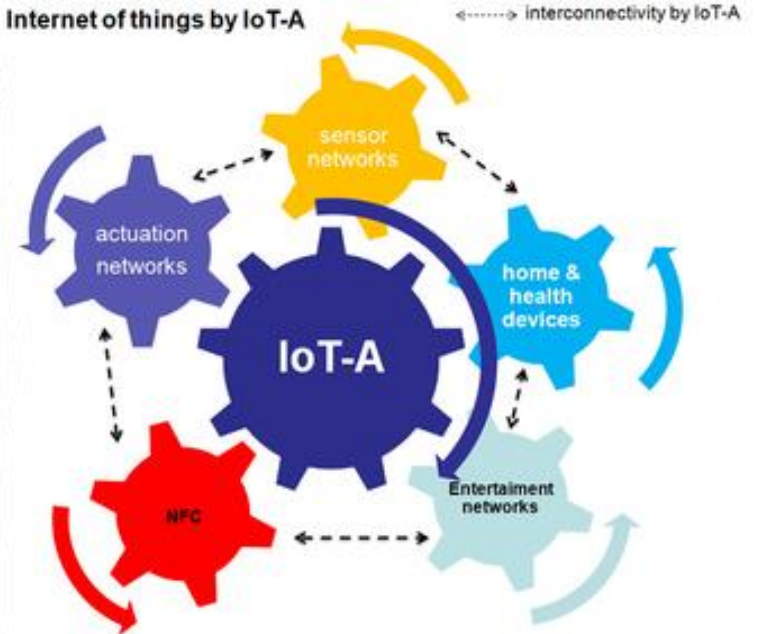


# Internet of Things Architecture (IOT-A)

## INTRANETS of things



## Internet of things by IoT-A



X protocols and technologies (e.g.) driving the intranets of things

- Coordinator: VDI/VDE INNOVATION + TECHNIK GMBH
- Budget: 18,680,000 in Euro (28 billion won)
- Duration: From 2010-09-01 to 2012-08-31
- Objective
  - Creation of an architectural reference model together with the definition of an initial set of key building blocks
- Solutions
  - To provide an architectural reference model for the interoperability of IoT systems, outlining principles and guidelines for the technical design of its protocols, interfaces and algorithms.
  - To assess existing IoT protocol suits and derive mechanisms to achieve end-to-end inter-operability for seamless communication between IoT devices.
  - To develop modelling tools and a description language for goal-oriented IoT aware (business) process interactions allowing expression of their dependencies for a variety of deployment models

# Semantic-Service Provisioning for the Internet of Things using Future Internet Research by Experimentation (SPITFIRE)

- Coordinator: NATIONAL UNIVERSITY OF IRELAND, GALWAY
- Budget: 2,860,000 in Euro (4.5 billion won)
- Duration: From 2010-07-01 to 2013-06-30
- Objective
  - Investigate unified concepts, methods, and software infrastructures that facilitate the efficient development of applications that span and integrate the Internet and the embedded world
- Solutions
  - Service Infrastructure
  - Semantics: Ontologies for sensors and sensor data, sensor information as Linked Data, Description mining for automatic semantic description
  - Semantic Entities: aggregate sensors into meaningful higher-level entities.
  - Content-based Search: semantic annotation-based search

# Summary

- Social and opportunistic computing
  - Opportunistic network을 활용한 서비스 플랫폼 개발의 시작
- Internet of Things 연구의 시작 단계
  - 센서 데이터를 위한 LOD, 온톨로지 연구가 진행
- 모바일과 인프라 플랫폼의 이질성
  - Android와 같은 모바일과 인프라 플랫폼의 호환성을 제공하는 환경 구축
  - 플랫폼들 간의 이질성을 해결하기 위한 오픈 표준 정의에 관심

# Discussion

- 사회적 관계에 기반한 협업과 공유 서비스의 제공
  - 기회의 발견과 제공 vs. 정보 보호(보안)
- IoT를 기반으로 한 사용자 환경 구축
  - 사용자 편의 vs. 사용자 감시
- 서비스 플랫폼을 위한 표준 정의의 필요성
  - 이질성 문제 해결 vs. 신규 기술 개발이나 제삼자를 위한 제약