

Future Internet: New Business Opportunities

Conclusions from scenario work
out of the FP7 projects 4WARD, SENSEI, E³

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New Business Opportunities

- ❖ Scenario areas on 'New Business Opportunities' are focusing on the non-technical aspects of the Future Internet
 - **evaluate impact** of social, economic and political **trends** on the ICT business
 - **identify** most **decisive elements** that are likely to govern **future business** environment
- ❖ The scenario description includes **study** of a couple of issues in the context of Internet evolution:
 - change of market balance
 - opportunities for new business players
 - regulation requirements to enable fair and reliable market conditions
 - cooperation strategy for established actors

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- ❖ Major outcome of the scenario work has been compilation of the **main drivers** and **main challenges** of the Future Internet business
- ❖ **Main drivers:** most relevant factors, about which common view was achieved on high impact and relevance:
 - aging society
 - environmental protection
 - security, privacy, trust
 - evolution from consumers to prosumers
- ❖ **Main challenges:** most relevant factors for influencing the research directions for the Future Internet
 - 3 scenarios selected for this study to extract main challenges
 1. Providers in Future Internet
 2. Real-world Internet
 3. Managing the Complexity

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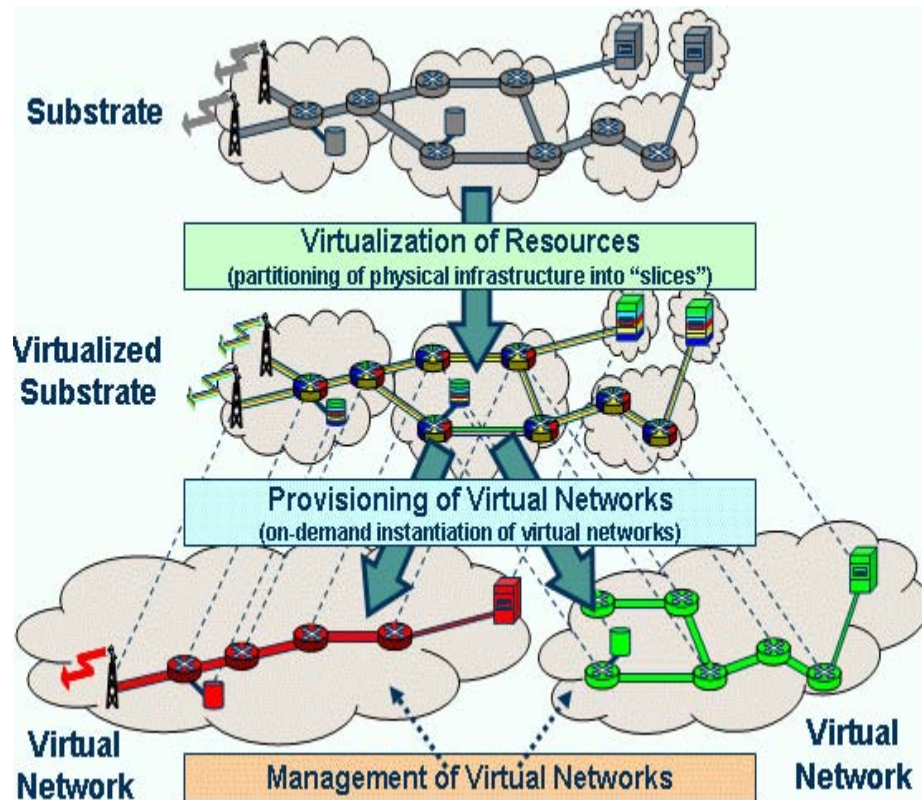
1. Providers in Future Internet (1)



- ❖ **‘Elephant’ scenario** characterised by strong forces
 - preserving a **given market regime**
 - allowing **changes** of market forces **only in slow-motion**
- ❖ **‘Gazelle’ scenario** characterised by
 - coexistence of **many players**
 - highly **dynamic market**
- ➔ **4WARD** scenario work focuses on **driving innovations** in the network layer to **create new socio-economic opportunities**

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1. Providers in Future Internet (2)



❖ Virtualization in Future Internet

- **New network ideas** can not start from scratch, they **need to evolve** from existing networks
- **Virtualization** can be used to **introduce disruptive concepts** and to **customize** them on the base of existing networks

❖ Provider business roles in virtual networks

- **Infrastructure** providers (investing in network hardware)
- **Virtual network** providers (building networks using virtualized capabilities)
- **Service** providers (offering services over the virtual networks)

Sources:

www.4ward-project.eu

4WARD deliverable. *First Project-wide Assessment on Non-technical Drivers*, Jan. 2009

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2. Real-world Internet (1)

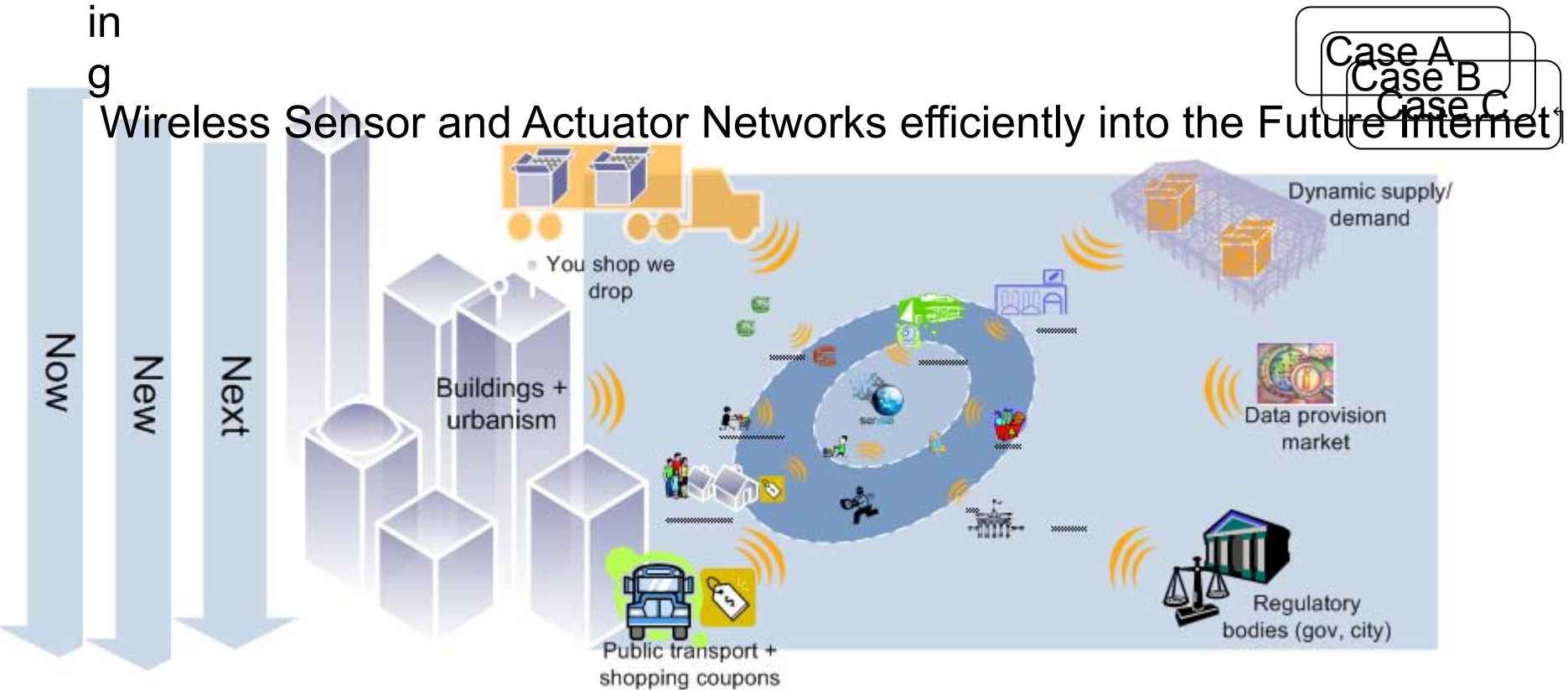
- ❖ 3 cases from SENSEI project
 - A: extended offer of services in a close smart place (short term)
 - B: interconnected city dwellers in mobile life style (medium term)
 - C: full integration of holistic information system in cities (long term)
- ❖ Business stakeholders in
 - A: Shopping mall's stakeholders federated by a neighbourhood of business interest
 - B: Numerous stakeholders to offer a broader and ubiquitous scope of end-user services
 - C: New business actors to provide a new generation of services to citizens and to regulate the prices depending on energy savings and the carbon emissions relations to clients' purchases
- ❖ Combined societal, business and technical outlooks
 - A: Evolutionary in terms of use and incremental for technology.
 - B: Futuristic and more innovative.
 - C: Even more revolutionary with both a very holistic and sustainable perspective

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2. Real-world Internet (2)

❖ Integrating

Wireless Sensor and Actuator Networks efficiently into the Future Internet



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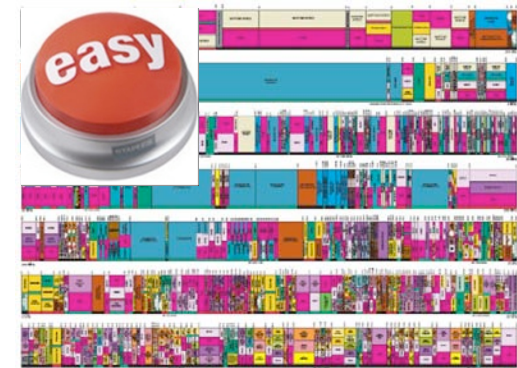
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3. Managing the Complexity (1)

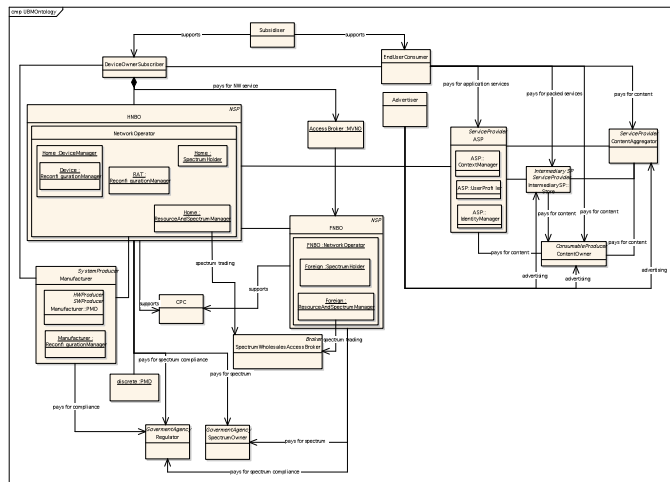
- ❖ E^3 project: **Autonomic and Cognitive Wireless Networking** opens business opportunities
 - 50 use cases identified (e.g. spectrum management, multi-homing equipments, base stations with self-x capabilities, femtocell deployment, spectrum sharing, and unlicensed spectrum bands)
 - Emergence of new market role: Unified Business Model (UBM)
 - But need to preserve the responsibility chain
- ❖ Network business becomes more and more diversified and heterogeneous
→ complexity increases
- ❖ Increases the role of the appropriate methodology
 - Do we know how to design cognitive systems?
 - Do we know how to model them?
 - Do we know how to evaluate their behaviours?
- ➔ E^3 believes that the answers can be given by ...



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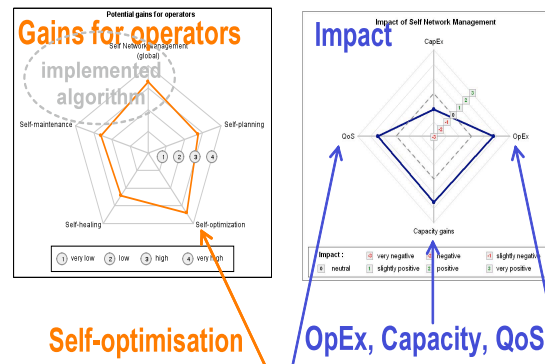
3. Managing the Complexity (2): Assessment Answers

Business Modelling & Assessment



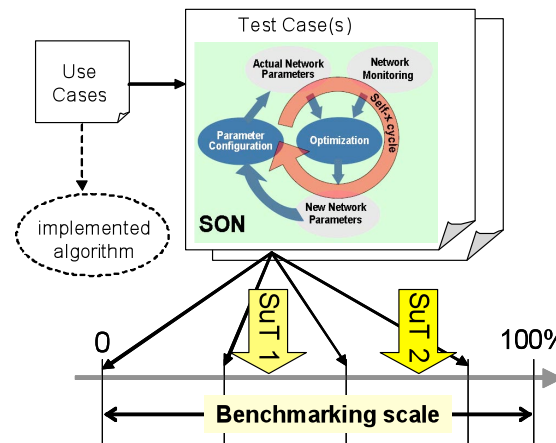
Definition and Analysis of a Unified Business Model ontology to map and analyse radically changing ecosystems
 Source: *E³ Business Modeling*, Simon Delaere, E³- SDR Forum Joint Workshop, 27 October 2008, Washington DC

Market Assessment



Based on 23 E³ interviews with major operators and vendors
 Source: *Business assessment, regulation and standardization activities in E³*, presented by T. Hain at CR-SDR, Seoul, 2009

Technology Assessment



Source: *E³ View on Assessment*, presented by J. Tiemann at COST 2100/SOCRATES meeting, Braunschweig, 2009

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Main Challenges (1)

- ❖ **Support safety-critical applications:** new technologies must support people to do the right things in a proper way and in a safe environment
- ❖ **Support the ‘Networked Everyday Life’:** allow communication not only among persons, but also between persons and things and among things, enable seamless data availability and exchange everywhere and anytime
- ❖ **Support mass-market customer requirements:** provide a satisfactory quality of experience for the average customer and high quality of experience on demand
- ❖ **Be a ‘Green Technology’:** Relieve the strain on the environment
- ❖ **Support existing and emerging business models:** enable new players to enter commercial and non-commercial services without disrupting existing services and without jeopardizing their evolution

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Main Challenges (2)

- ❖ Follow the **'Internet Community' style** (decentralized and collaborative processes, open standards)
- ❖ Future Internet shall **comprise virtualization** means to allow their exploitation **wherever appropriate** from business or market needs.
- ❖ The **architecture** of a 'real-world Internet' application platform should be **designed** to meet the demands of **multiple players** in Future Internet.
 - The most important demands are 'scalability' and 'horizontalisation', followed by 'privacy and security', 'heterogeneity', 'simplicity', 'manageability', 'service differentiation', 'continuity', and 'viability'
- ❖ The **architecture** must be **scalable** to support a **growing number of highly distributed service endpoints** acting as producers and consumers of real-world information and actuation

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