

**Pre-Iciss**

*December 13rd 2008*



# RFID and health care

*What are the main challenges?*

P.J. Benghozi

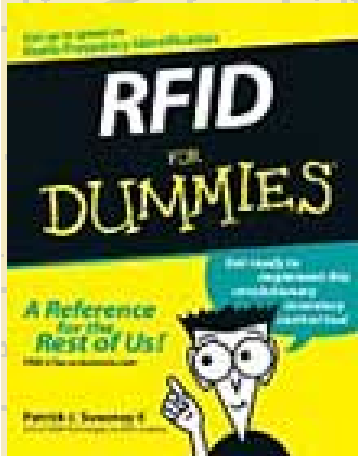
S. Bureau



The school of Management for Europe



# IoT = the future of the internet ?



- ✦ **R&D programs exist all over the world**
  - Europe (ambient intelligence), Japon (ubiquitous computing) China
- ✦ **Complementary technological paths :**
  - From bar code to multiple electronic identification devices
  - From early B2B (logistic) to massive applications (animals, children...)
- ✦ **And conflicting visions**
  - Narrow or global point of view
  - Fonctional and practice-based or specific technical process
- ✦ **Supported by major socio-technico-economic trends**
  - From product to services
  - From fixed to mobile technologies
  - Physical and virtual worlds
  - Complex and unstable technological choices and standards
    - Legal and industrial uncertainty / Gouvernance and economic models
  - Attractive technologies
    - But quite unknown and badly accepted
- ✦ **Facing various questions at stake :**
  - constituency, sustainability and (low) cost
  - Portfolio of technologies, networks and applications
  - Incentive and support for innovation for economic growth
  - To implement pervasive but non intrusive informations systems

## A System of Systems and a Network of Networks...

Type of system	Identification (including	Sensors	Connection	Integration	Data processing	Networks
<b>Stakes</b>	Identifying each object in a unique way and retrieving data stored in the object	Collecting information in the environment to enrich the functionalities of the systems	Connecting systems between themselves	Integrating systems for data to be transmitted from one layer to another	Storing and analysing data to launch a process or ease decision-making	Transferring data to and from physical and virtual worlds
<b>Old technologies (examples)</b>	Barcodes, simple RFID solutions	Thermometer hydrometer...	Cables, ...	Middleware...	Excel, ERP, CRM...	Internet, Ethernet...
<b>Recent technologies (examples)</b>	Complex RFID solutions RFID, Surface Acoustic Waves, optical	Miniature sensors, nanotechnologies	Bluetooth, Near Field Communication, WiFi...	Complex middleware	Datawarehouse 3D (compatible with RFID chips), Semantic Web ...	EPCglobal network...

chips, ADN

# Drivers and technical uncertainties

## 🔦 Competing technical solutions

- Different types of RFID
- Alternatives solutions to RFID

## 🔦 The main technological needs.

- Guaranteeing the performance of solutions in use contexts
- Ensuring the durability of solutions
- Conceiving an efficient data management system
- Some specific bottlenecks (memory, privacy...)

## 🔦 The standardization in the IoT : a key dimension

- Dependence on existing standards.
- A standard of standards.
- Standards “granularity” and interoperability

## 🔦 What about healthcare?

- Reliability
- Interoperability along the medical chain

# Business uncertainties

## What performance?

- Local contexts (quality, prices...)
- Macro effects

## Who should invest and why?

- Traditional firms vs new entrants
- ROI

## New Business Models

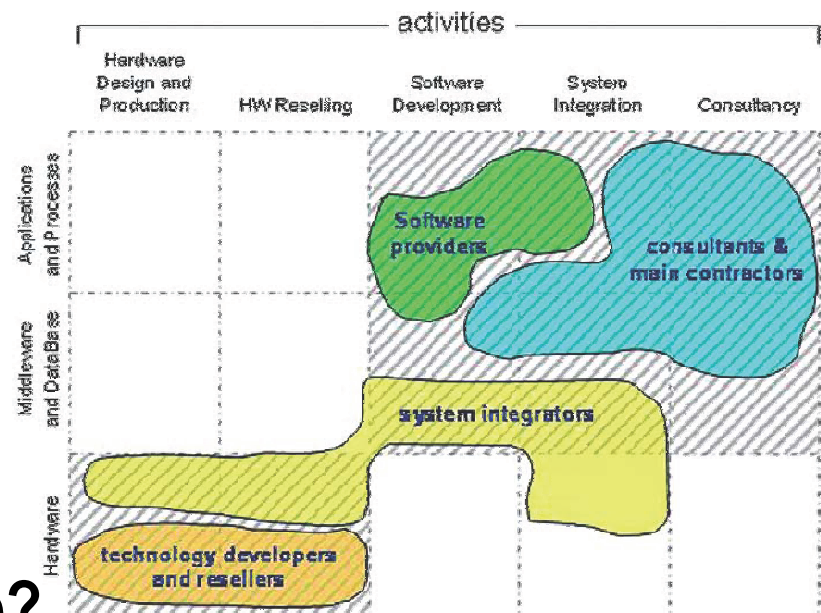
- Redefinition of the value chains
- New services for consumers
- New resources for efficiency

## The supply side

- Which market ?
- Which suppliers ?

## What about healthcare?

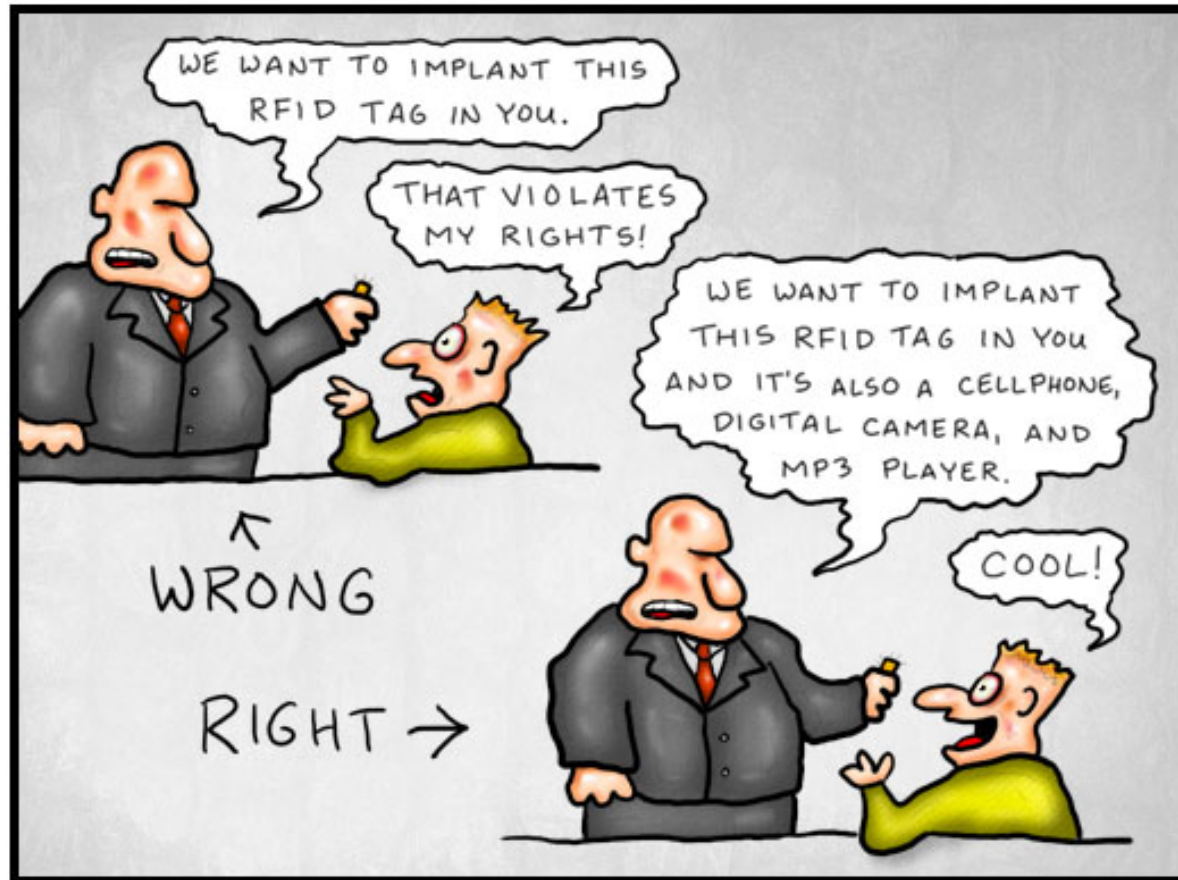
- Pharmaceutical industry and counterfeiting
- Hospital applications and clinical management



# The usability viewpoint

## DOCTOR FUN

16 Jan 2006



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<http://ibiblio.org/Dave/drfun.html>

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# Diffusion uncertainties



## 🔦 Myths and high expectations

## 🔦 Privacy and its solutions : the mostly mentioned risk

- Multifaceted risk
  - Traditional + emerging
  - Personal + industrial
  - Technical + process questions
- Efficiency vs. privacy
- Alternative solutions: multiple identities, regulation
- A market for security and Privacy Enhancing Technologies



## 🔦 What about healthcare?

- Medical data / employers, insurances
- Sub-cutaneous tags



# New risks





# Startling risks

☛ A new space for viruses and hacking

☛ M2M risks and liability

- Environment
- Falsification
- Logarithmic conflicts
- Trust in informations

☛ Ethical concerns

- From things to animal and individual tagging
- awareness and education
- Freedom of silence, withdrawing and forgetfulness





# Governance Uncertainties

## 💡 **RFID call for regulation**

- Disruptive technologies and applications
- Industrial policy and incentives for R&D + implementation
- Competition policy : vertical and horizontal integrations

## 💡 **Technical Governance**

- Standards
- Frequencies

## 💡 **Governance of network infrastructure**

- Type of networks
- The principle of neutrality

## 💡 **Regulatory frameworks**

- Institutions & Firms
- Consumers and citizens
- Standardization of data

## 💡 **What about healthcare?**

- The FDA regulation

# Thank you for your attention



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**Building tomorrow's Internet together**

For the past ten years, the Internet has become a strategic infrastructure, with an economic and social role. The Internet is a powerful driver for worldwide innovation.

A slide titled 'The Internet Of Things' in large, orange, serif font. It includes logos for 'innovation &amp; regulation chair' and 'VoXInternet www.voxinternet.org'. Below the title, it asks 'What is at Stake for Europeans?' and is dated 'Octobre 2008'.