

---

# FP7 Project ASPIRE eLiberatica – Romania, May 2008

Speaker: Humberto Moran – Open Source Innovation Ltd  
[hmoran@opensourceinnovation.org](mailto:hmoran@opensourceinnovation.org)

Project Coordinator: Neeli R. Prasad  
Center for TeleInfrastruktur (CTIF)  
Aalborg University / Denmark

**ASPIRE**  
FP7 Integrated project



## About Open Source Innovation Ltd

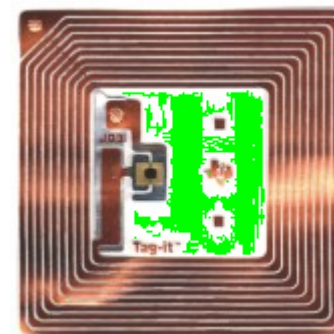
---

- Charity Registered in England
- Mission is to promote the creation and adoption of OSS when social and environmental benefits are significant
- Established in 2004 by a group of enthusiasts
- Small organisation with a difficult start
- However, we have secured two big grants and have triggered the project ASPIRE presented today
- Currently focused on RFID due its promising benefits and social acceptability challenges

## Background – about “The Internet of Things”

---

- Also referred to as “electronic barcodes”, RFID tags are tiny computers used to identify everyday objects
- Recognised as the “next big thing” in ICT after the Internet
- Many initiatives to promote it and “make it happen”
- Significant economic, social and environmental benefits
- Also, significant social threats



# The Virtues of RFID

## Scores of Industrial Applications



### Manufacturing and distribution

Improved traceability (product recalls)

Streamlining of operations

Reduction of theft and counterfeiting

Detection of misplaced products

### Retailers

Improved on-shelf availability

Automatic check-outs

Interactive marketing

Improved replenishment



**ASPIRE**

FP7 Integrated project



# The Virtues of RFID – Benefits for consumers

Separation of custody and ownership  
Intelligent products  
Self-replenishment  
Improved product quality and security  
More information about products

## Supermarket example

Shopping list  
Budget control  
Allergy and nutritional information  
Available offers  
Recipes  
Automatic check-outs (no queuing)  
Price comparison



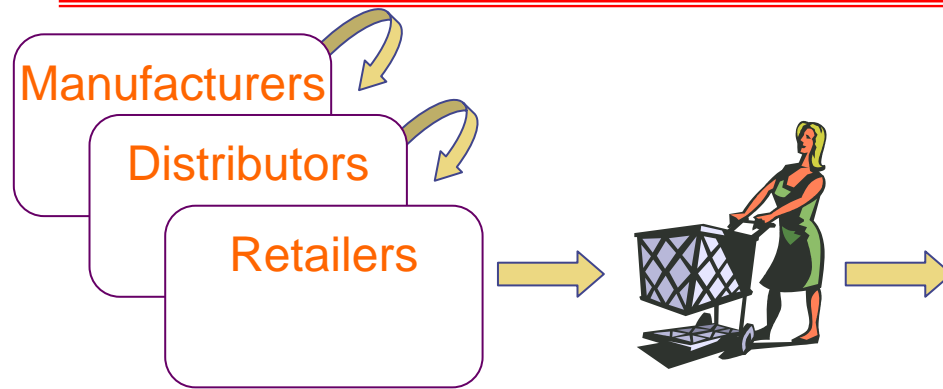
# The Virtues of RFID – beyond-ROI applications



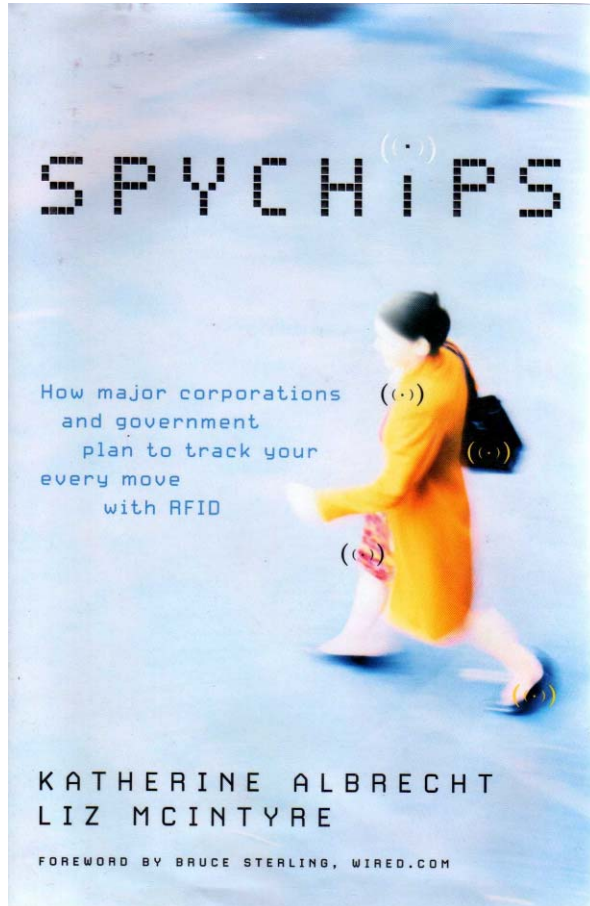
Tracking of livestock  
Control of medication  
Replenishment/location of things for people with limited mobility  
Support for the visually impaired



# The Virtues of RFID – open vs closed supply chain



# The perils of RFID – privacy and security



## Privacy threats – reality or paranoia?

- Enablement of big-brother practices
- Knowledge of individual preferences
- Abuse by third parties

**The myth of trade-off: “Any society that would give up a little liberty to gain a little security will deserve neither and lose both” (Benjamin Franklin)**

## Privacy issues have already prompted opposition:

- Boycott against Wal-Mart, Tesco, Gillette and Benetton
- Spychips books (US)
- Recommendations by governments

# The Perils of RFID – How can RFID violate our privacy?



Tags are not discreet  
They talk to everyone  
They say too much  
We don't hear them talking!



```
01.0000A89.00016F.000169DC0
```

Header 0-7 bits	EPC Manager 8-35 bits	Object Class 36-59 bits	Serial Number 60-95 bits
--------------------	--------------------------	----------------------------	-----------------------------

We teach our kids not to talk to strangers  
... our RFID tags should do the same!

# The Perils of RFID – How can RFID violate our privacy?



Commercial environment –  
nuisance and discrimination

- Shopping habits
- Interactive marketing
- Previous buys



Public places and domestic environment

- Living habits
- Income and wealth
- Health
- Sexual behaviour
- Religious inclinations
- Political views/activities

# Privacy threats are not limited to RFID!

Cookies  
Phishing  
Spam  
Viruses  
Spyware

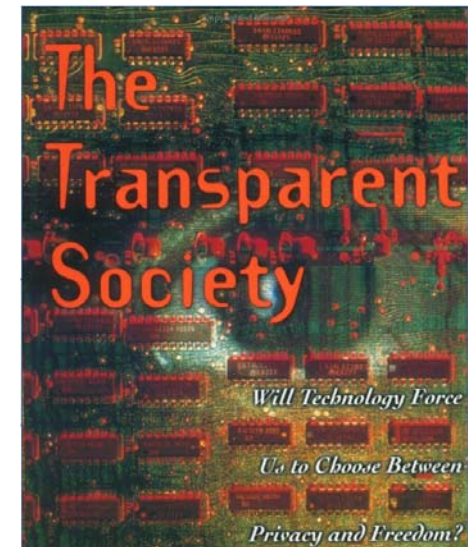
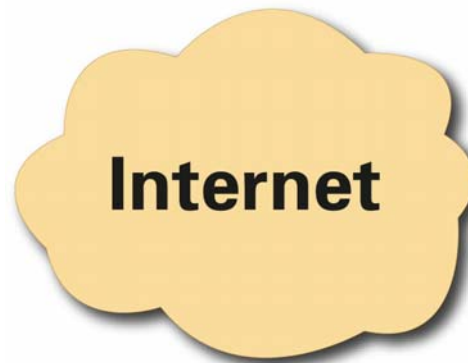
The Internet experience showed the perils of new technologies

How is online privacy protected?

US: Self-regulation  
EU: limited legislation  
Consumer caution  
Certification programmes

Not very successful !

Web bugs  
Credit card fraud  
Identity theft  
Unauthorised publications  
Trade of personal data/preferences  
Email scanning (gmail!)  
Customer specific pricing  
Websites where you can investigate a person



# Understanding RFID threats

---

## BEFORE the Point of Sale (POS)

- Privacy threats
  - Tracking and tracking of citizens by companies
  - Customer profiling
  - Industrial espionage

## AFTER POS

- Privacy threats
  - Tracking and tracing of citizens using tagged identity proxies (e.g. shoes)
  - Detection of privacy-sensitive objects (e.g. medicines, implants)
- Security threats
  - Detection of expensive products (e.g. Rolex or jewellery)
  - Abuse by terrorists (e.g. book by Salman Rushdie)

## Other challenges facing the RFID revolution

---

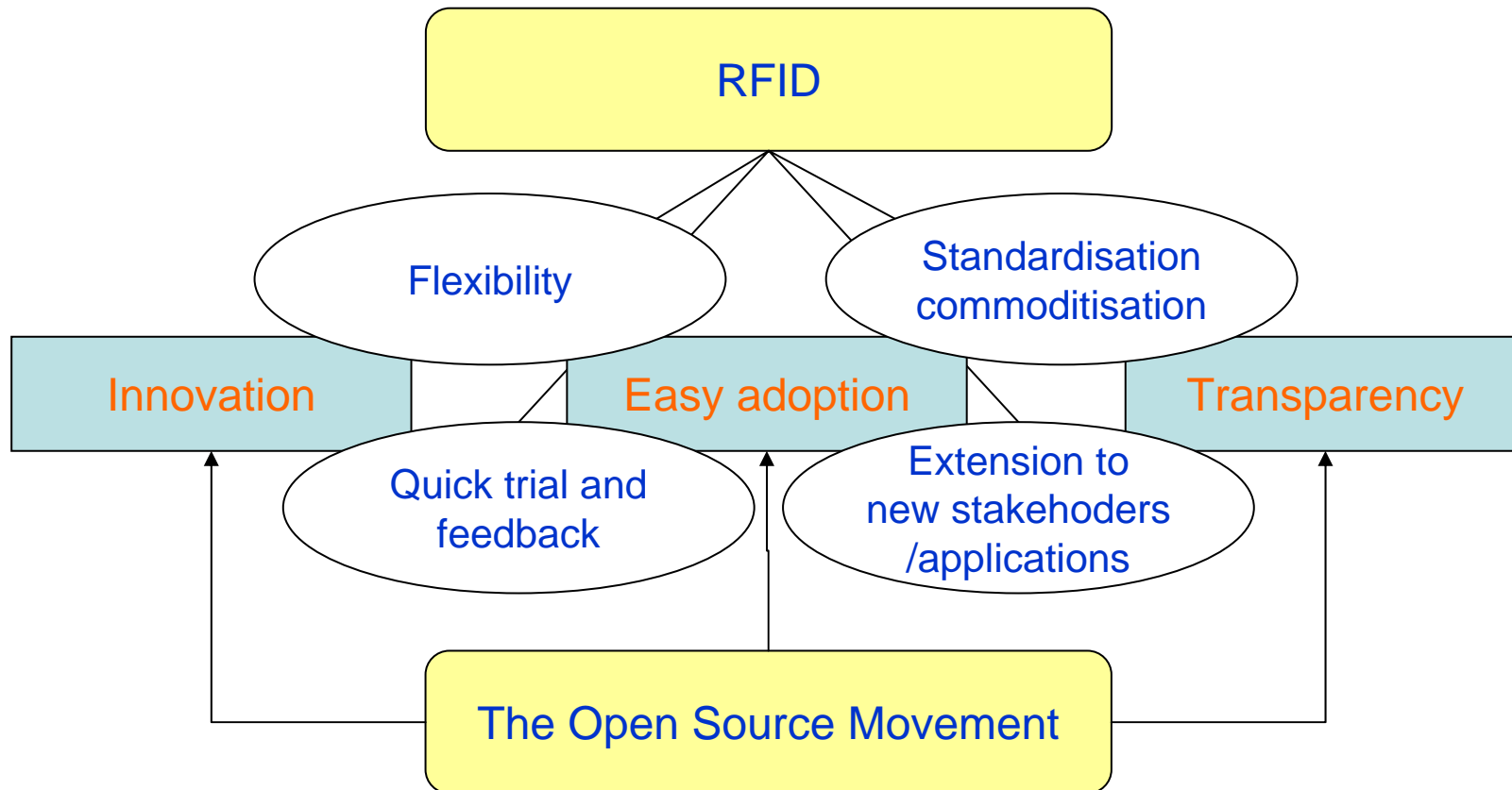
- Standardisation and interoperability
  - Frequencies and regulations
  - Governance of existing bodies
  - IP situation
- Profitable business cases
  - Adoption and operation costs are too high
- Dissemination to beneficiaries, consumers and citizens
  - Irrational fear by some consumers
  - Irrational opposition by extreme groups

## How can OSS support socio-technological processes of RFID?

---

- Adoption
  - Affordability, availability, flexibility
- Standardisation
  - Open code makes it easier to create or extend interfaces
- Innovation
  - Many minds and eyes involved
  - Knowledge builds over knowledge
  - End-user involvement, quick test and feedback
- Transparency
  - Open code is visible by everyone
  - This allows using privacy-friendly algorithms and techniques, and auditing and certification programmes

# Why OSS for RFID?

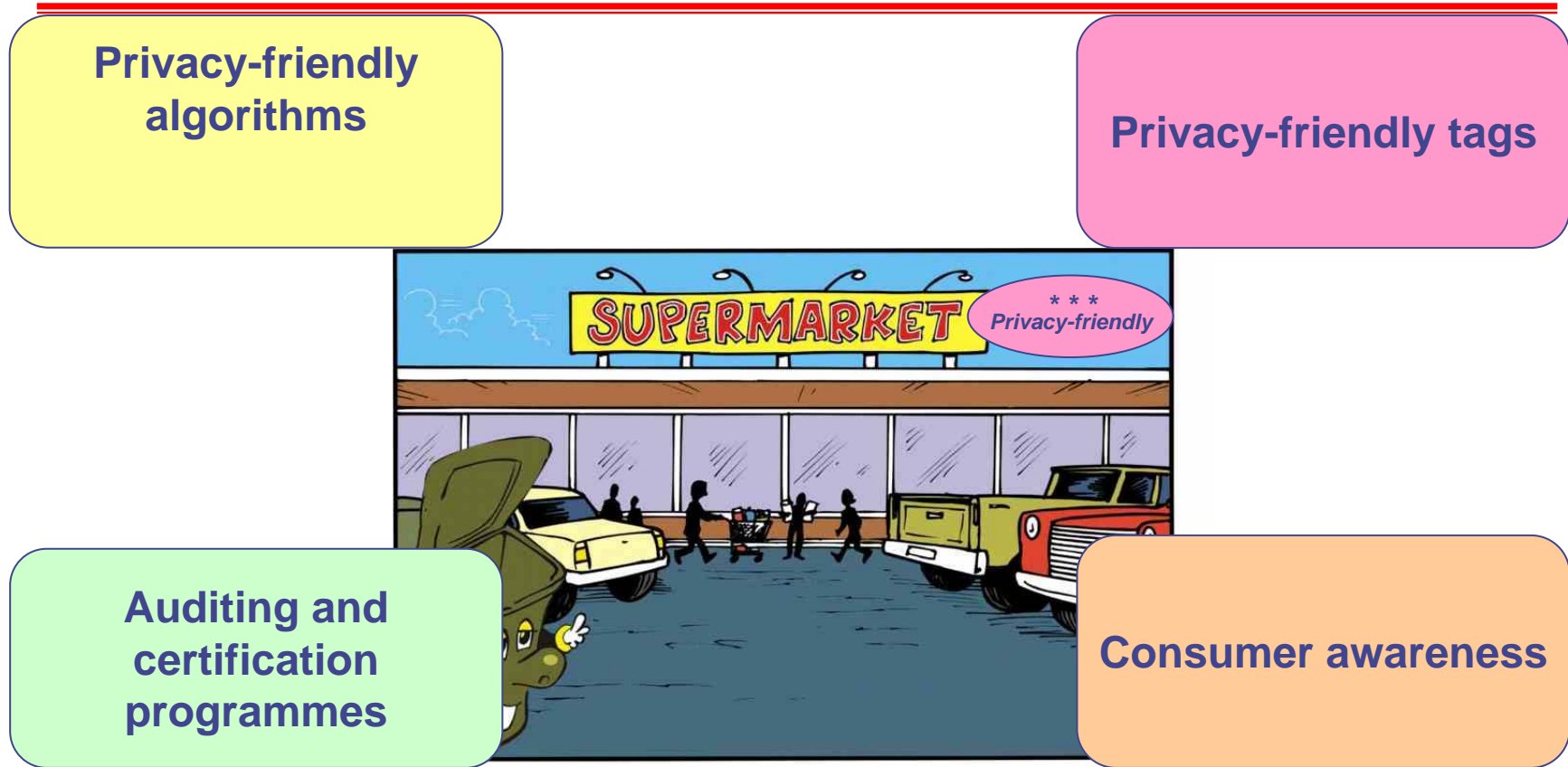


## Brief history of ASPIRE

---

- OSS RFID Middleware idea was proposed by Open Source Innovation in Brussels in the 2006 RFID Public Consultation
- Objectives:
  - Bring SMEs to the RFID process
  - Standardisation tool
  - Promote innovation
  - Create certifiable privacy-friendly RFID middleware
- A consortium of renowned organisations led by Athens Information Technologies put together an FP7 proposal
- The proposal materialised in the €6M project ASPIRE which started in January 2008

# Fundamentals of ASPIRE's privacy-friendly approach



# ASPIRE Overview and Goals



Significantly lower the SME entry cost barrier and Total Cost of Ownership (TCO) for RFID technology solutions:

- Free Middleware running on Low-cost hardware
- Lower effort for managing the infrastructure and developing applications

*Enable RFID scenarios (based on ASPIRE middleware and added value sensors) that improve business results*



*Validate the above developments in RFID trials*

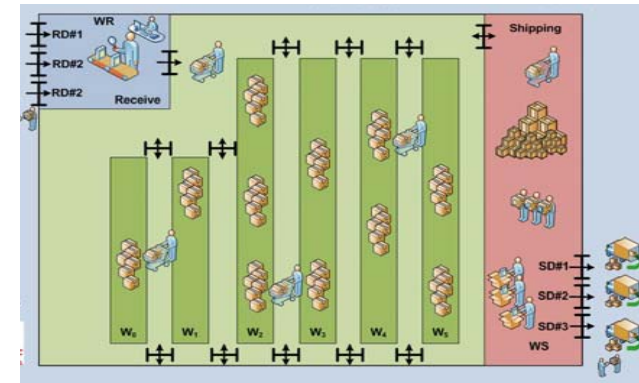
## ASPIRE Consortium

---

- **Aalborg University – CtiF, Denmark**
- **INRIA (ObjectWeb, POPS), France**
- **Université Joseph Fourier – Grenoble University – LIG Laboratory, France**
- **Research and Education Laboratory in Information Technologies – Athens Information Technology, Greece**
- **Melexis technologies SA MELE, Switzerland**
- **Open Source Innovation Ltd OSI UK**
- **UEAPME, Belgium**
- **Sensap S.A, Greece**
- **Pole Traceability Valence, France**
- **Instituto Telecomunicações IT, Portugal**
- **Timeframe: 01/01/2008 – 31/12/2010**

## ASPIRE SME Orientation – our customers!

- **ASPIRE development will be SME driven and SME oriented**
- **Liaison with SMEs**
  - **Requirements Collection and Analysis**
  - **RFID Technology Dissemination – Workshops for SMEs / “RFID Information Days”**
  - **Trials Organization – Deployment (ASPIRE middleware)**
  - **Liaise with existing trials – Deploy new**



## Other characteristics of ASPIRE

---

- Programmability
  - Flexibility to adapt to all possible business processes
- Compatibility / interoperability
  - With ISO, EPCglobal and other RFID standards
  - Development of new standards if necessary
- Low-cost sensors and readers
- Adapted to European needs and requirements

## ASPIRE – Ongoing activities

---

- Early engagement of the OS Community to collaborate with the project
- Early engagement of SMEs to provide end-user requirements and participate in ASPIRE
- Study of existing RFID OSS for reuse purposes
- Study of current standards for compliance
- Design and development of ASPIRE's architecture
- Programming of ASPIRE's necessary modules
- Setup of collaborative tools

## Invitation, questions and discussion

---

If successful, ASPIRE will produce privacy-friendly OSS RFID middleware tailored to European requirements.

We would like to invite the OS Community, Romanian industry and innovators to join the ASPIRE project and OSI by contributing end-user requirements, ideas, collaborating with the development activities etc.

**ASPIRE**  
FP7 Integrated project

