
FP7 Project ASPIRE

eLiberatica – Romania, May 2008

Speaker: Humberto Moran – Open Source Innovation Ltd
hmoran@opensourceinnovation.org

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

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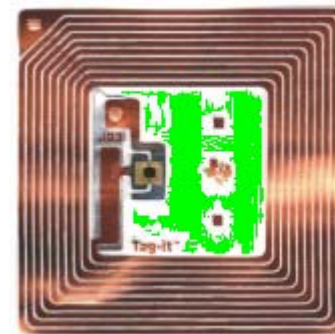


About Open Source Innovation Ltd

- 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



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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



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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

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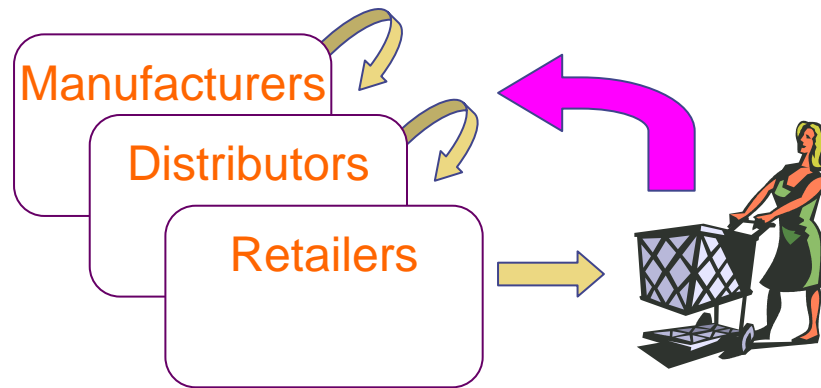
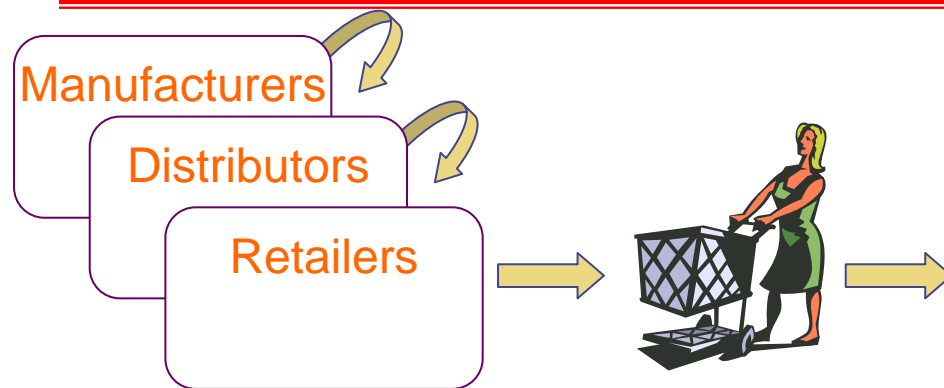
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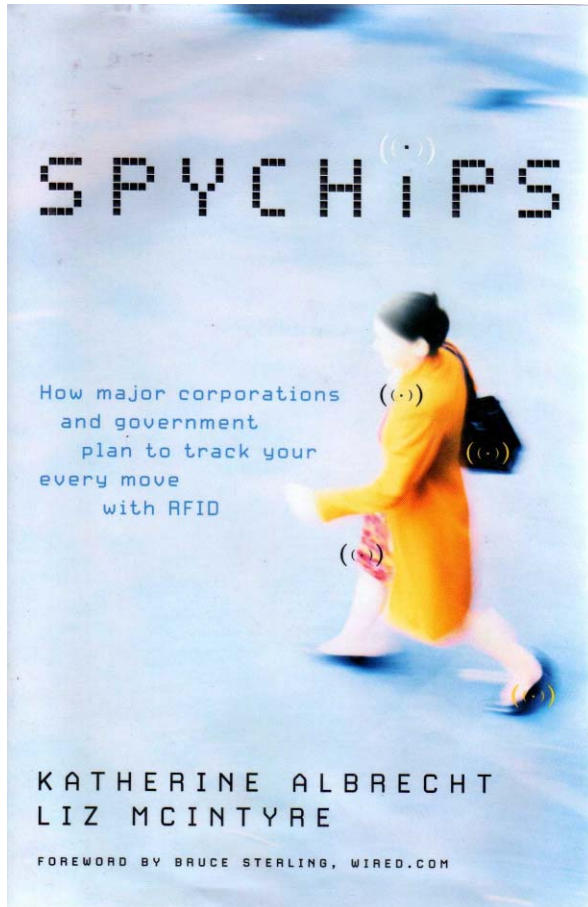
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The Virtues of RFID – open vs closed supply chain



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!

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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

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Privacy threats are not limited to RFID!

Cookies

Phishing

Spam

Viruses

Spyware

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

The Internet experience showed the perils of new technologies

How is online privacy protected?

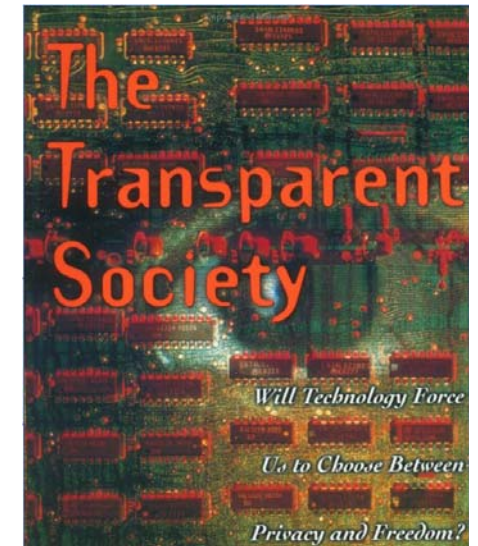
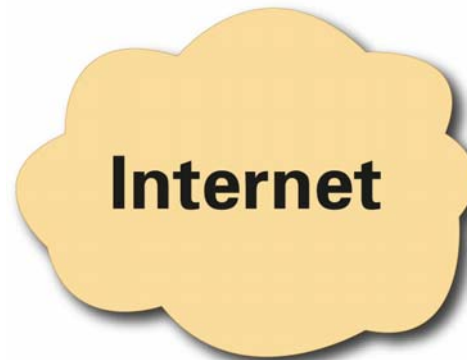
US: Self-regulation

EU: limited legislation

Consumer caution

Certification programmes

Not very successful!
!



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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)

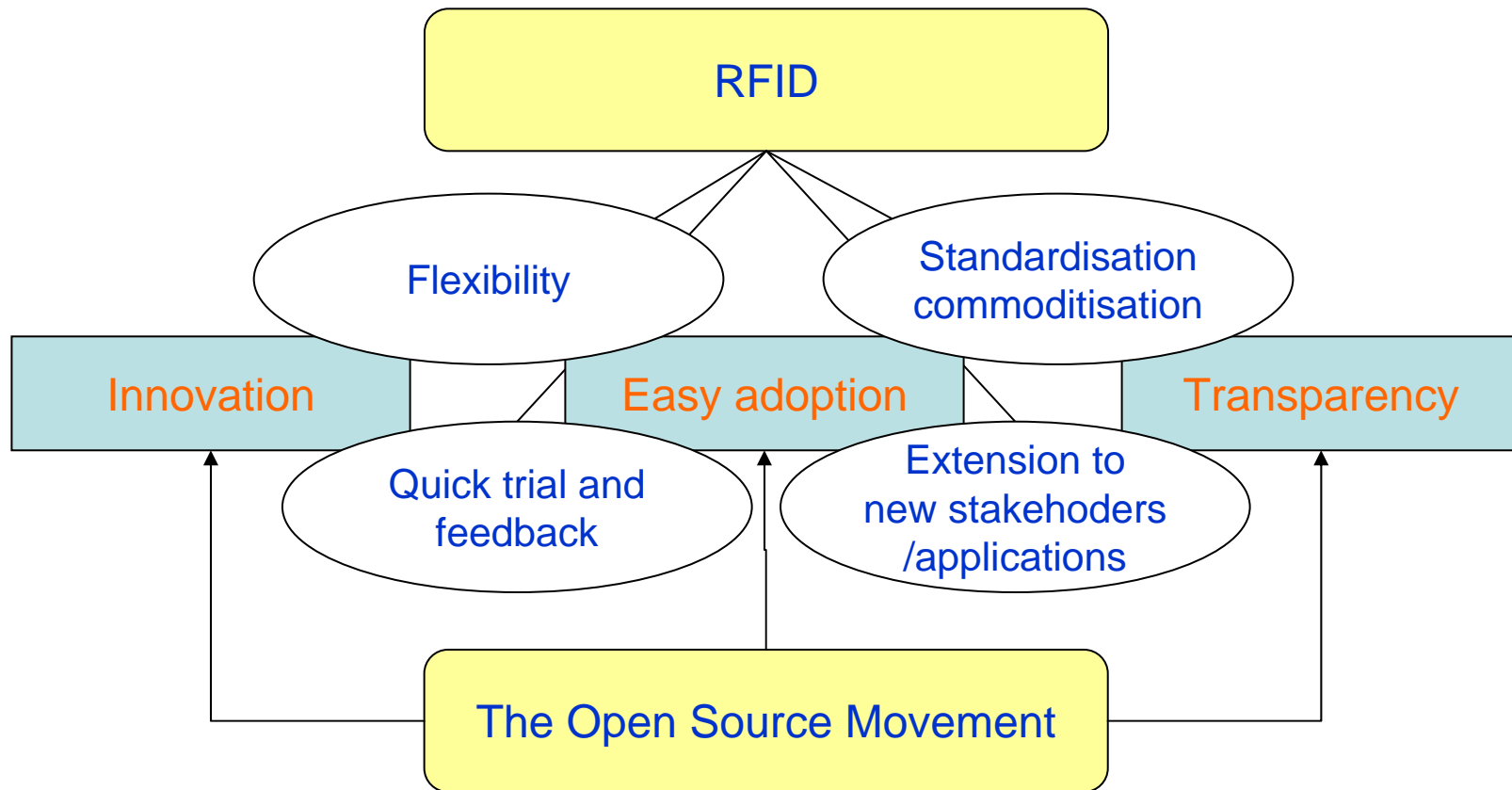
Other challenges facing the RFID revolution

- 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

Privacy-friendly algorithms

Privacy-friendly tags



Auditing and certification programmes

Consumer awareness

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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

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Develops and will deliver a lightweight, royalty-free, programmable, privacy-friendly, standards-compliant, scalable, integrated and intelligent

middleware platform

Validate the above developments in RFID trials

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2007 - 2013

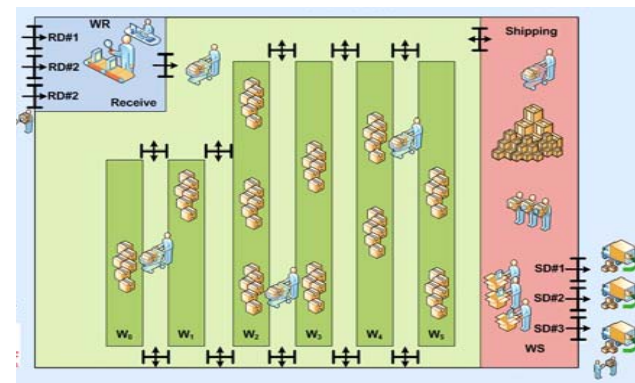
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ASPIRE Consortium

- 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.

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