RFID, privacy and information sharing

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Overview

- Part I
  - International Workshop Series on RFID
- Part II
  - *Personal Privacy Assistants* for RFID Users

International Workshop Series on RFID

RFID

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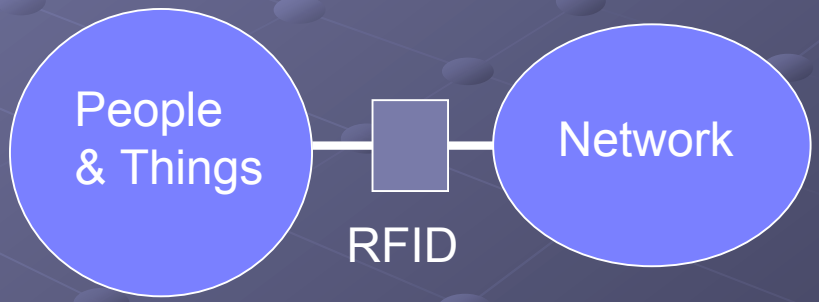
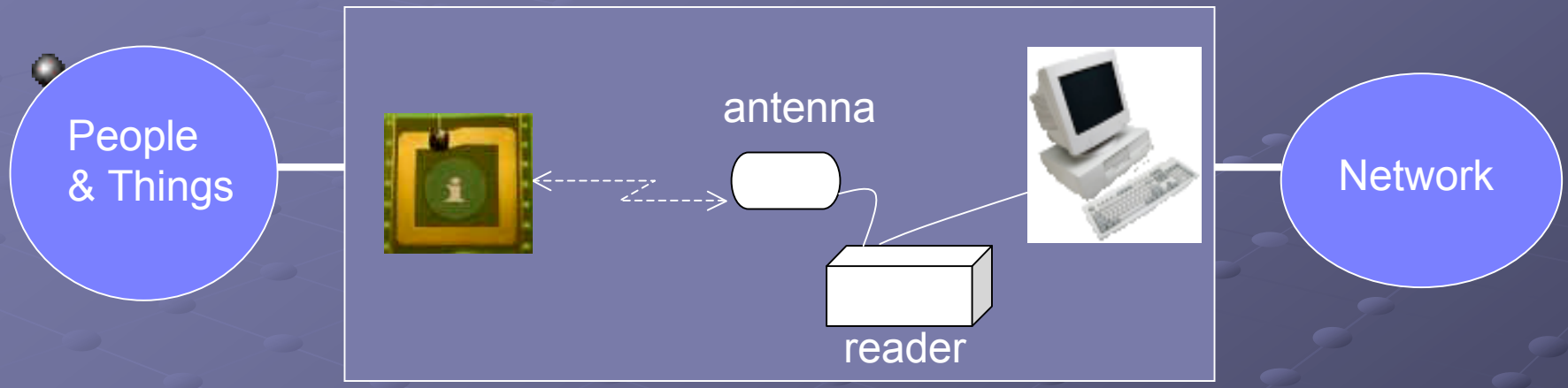
- Radio Frequency Identification
- Why is it important?



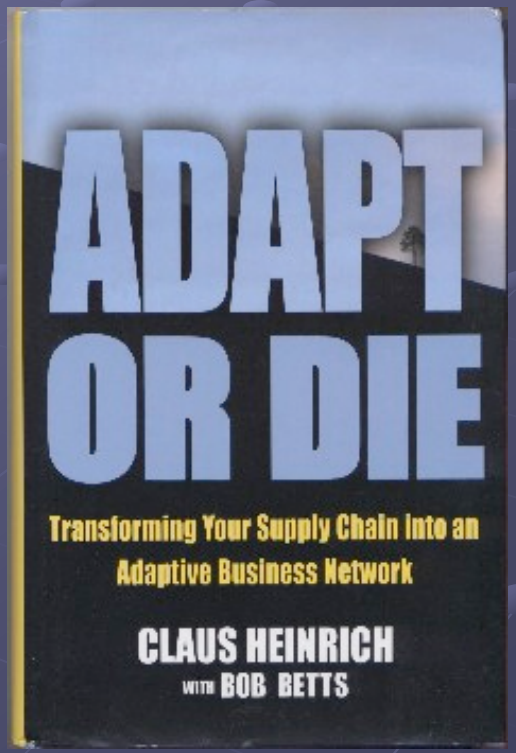
RFID Technology in a nutshell



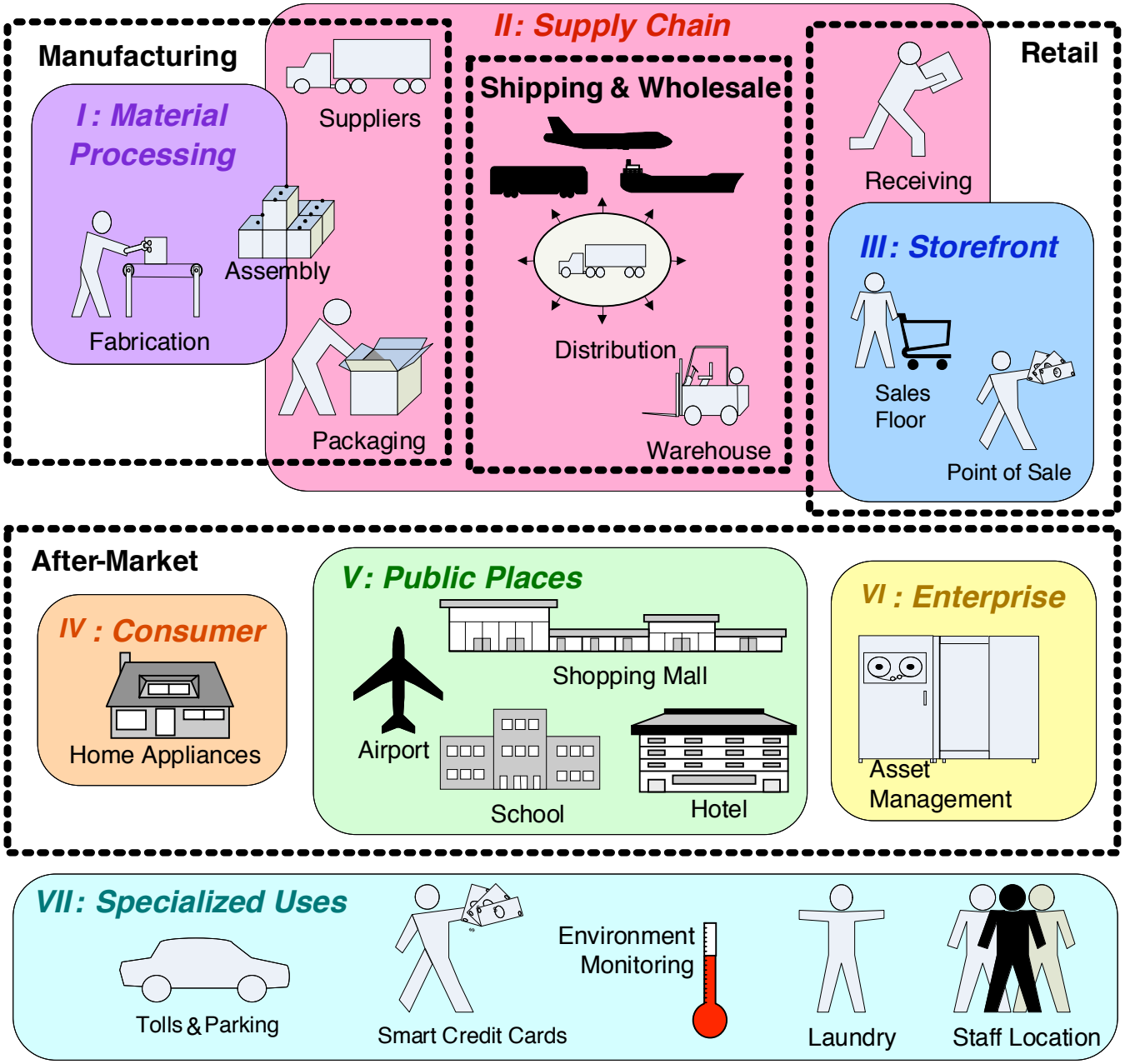
- *Carried by, attached to, or embedded in* people & things
- *Invisible* data capture
- *Unique* identification
- Read *many at once*
- *Writable*

Background

- RFID Technology is quickly proliferating
  - Mandates, market momentum
- Many problems still remain
  - Privacy
  - Cost > 5¢
  - Reading <100%
  - Software
  - Standardization
  - Intellectual property



Settings for RFID Use (Hargraves and Shafer, 2004)



Example: tracking school children

Recent pilot tests
- Rikkyo Elementary School, Tokyo
- Iwamura Elementary School, Gifu
- Kakogawa Daycare Center, Hyogo

- Location, identity, time
- Surveillance camera
- Historical data

No tracking ? Pervasive tracking

Privacy and freedom *Safety, peace of mind*

Example: dissemination of product-related information

- Product Information Database
  - Centralized regulation by industry organization
- Small to mid-sized retailers who want to disseminate their own information are facing difficulty

No dissemination — any data anywhere at anytime

?

No cost — *Reaching consumers*

Challenge

- Allowing people to share and protect
  - the *right* information
  - at the *right* time/place
  - in the *right* way
  - among the *right* people

- Models
- Technology and tools
- Contextual factors
- Collaboration
- End-user needs
- Lessons learned
- New paradigms
- Design principles and solutions

International Workshop Series on RFID - Information Sharing and Privacy –

- Workshop 1: November 10, 2004
- Workshop 2: December 6, 2004
- Tokyo, Japan

- System designers, hardware/software/security/HCI researchers, economists, and social scientists
  - bring together different perspectives, views and ideas in a constructive way, and
  - lay out an agenda for RFID privacy and information sharing research in the next 3-5 years.

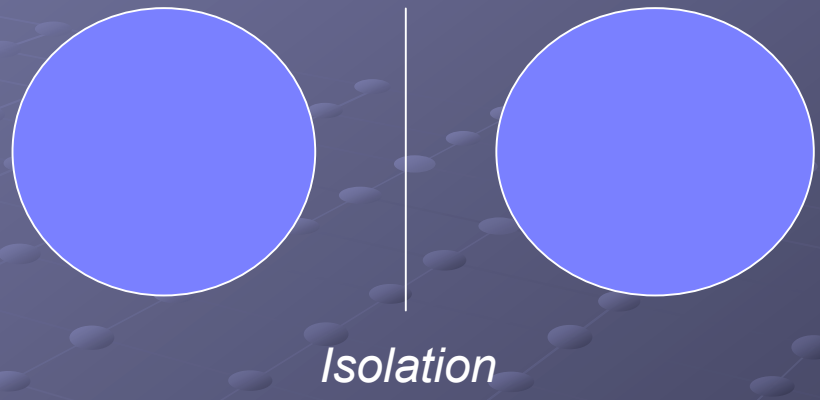
- Invited Speakers
  - Workshop 1
    - Gerhard Fischer (University of Colorado, USA)
    - Frank Stajano (University of Cambridge, UK)
  - Workshop 2
    - George Roussos (University of London, UK)
    - Norbert Streitz (Fraunhofer IPSI, Germany)

http://www.slrc.kyushu-u.ac.jp/rfid-workshop/

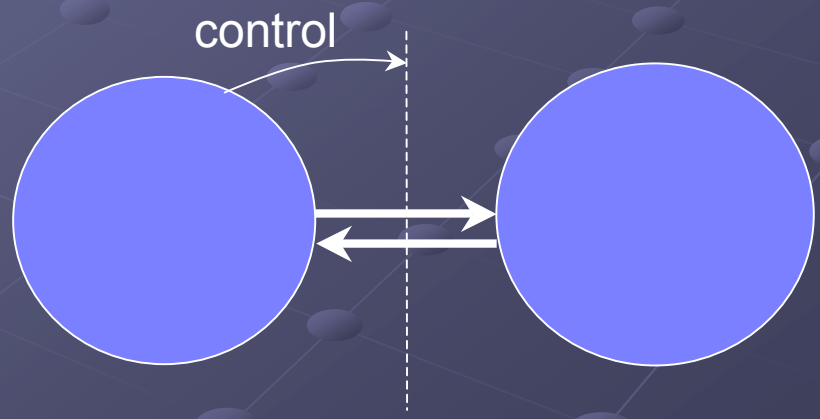
Personal Privacy Assistants for RFID Users

What is privacy?

- Traditional view
  - "the right to be left alone"
- Another view (Altman, 1975; Palen and Dourish, 2003)
  - Selective control of access to the self (or to one's group)



Isolation



Boundary regulation process

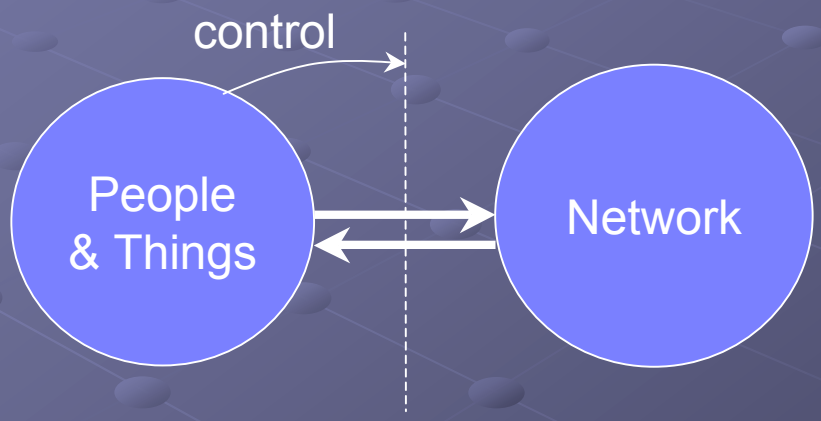
Existing approach to enhancing privacy

- Killing tags
- Faraday cage
- Active jamming
- Sophisticated tags
- Blocker tags
- Local computation
- Information management
- Social regulation

Mostly technologies for isolation

My position

- Privacy is an HCI problem
- A critic-based mobile user interface for *boundary control*



Boundary control

Mobile User Interface (example)

RFID readers are being integrated with PDAs, Mobile phones and wristwatches

Problems of technology-mediated communication

- *Disembodiment* in CSCW systems
  - May lead to difficulty in conveying information about myself
- *Dissociation* in CSCW systems
  - May lead to difficulty in gaining information about others
- *Loss of self-reflection or "Disreflection" (c.f. reflexive CSCW)*
  - May lead to difficulty in gaining information about myself
  - RFID highlights this class of problems
    - A unit of information disclosure is a *scan*
    - A user is scanned at various places, at various points in time
    - A scan produces data bits that are not meaningful by themselves
    - A scan's meaning is largely influenced by its context such as:
      - Databases on the network
      - Interests of "watchers"

➔ All these problems lead to users' limited sense of control

A success model: food traceability

- Companies are *building better brand identities* by making food traceability information (private information) available to consumers. Also, consumers appreciate peace of mind.

- In contrast, consumers using supermarket loyalty cards do not generally have such *a sense of control about their identities*

Personal Privacy Assistants (some ideas)

- An integrated user interface to view and control *all* incoming and outgoing information about an RFID user
  - PPA acts as *critics*
    - Wristwatch vibrates -- *"According to XXX, disclosure of this scan leads to severe privacy risks such as..."*
  - PPA negotiates *view sharing*
    - *"Tell me how you see me if you want to see me"*

Photo: UW SmartWatch System

Conclusion

- International Workshop Series on RFID
  - http://www.slrc.kyushu-u.ac.jp/rfid-workshop/
- Personal Privacy Assistants
  - Boundary control rather than isolation
  - PPAs provide users with feedback and a better sense of control
  - Still an early stage of research
- Questions, comments, etc. are very welcome