Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Project "SERAMIS"

Sensor-Enabled Real-World Awareness for Management Information Systems

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GS1 Global Standards Event
Rome (08-Oct-2014)

40 years behind bars

- **1970** – Formation of the Ad-hoc Committee (aka UCC) by five US retailers and five grocery manufacturers
- **April 1st, 1973** – Official ratification of the Universal Product Code
- **June 26th, 1974** – First scan of a UPC-equipped product at Marsh Supermarkets, Troy (Ohio)
- **March 22nd, 1976** – Business Week: 'The Supermarket Scanner that failed'
- **1984** – Wal-Mart, Kmart, and others issue barcode mandates on their suppliers
- **1990s** – Increasing deployment of interorganizational systems for Electronic Data Interchange

Expected vs. real benefits of the barcode

Estimates of the business case for the barcode at different points in time (in % of sales)

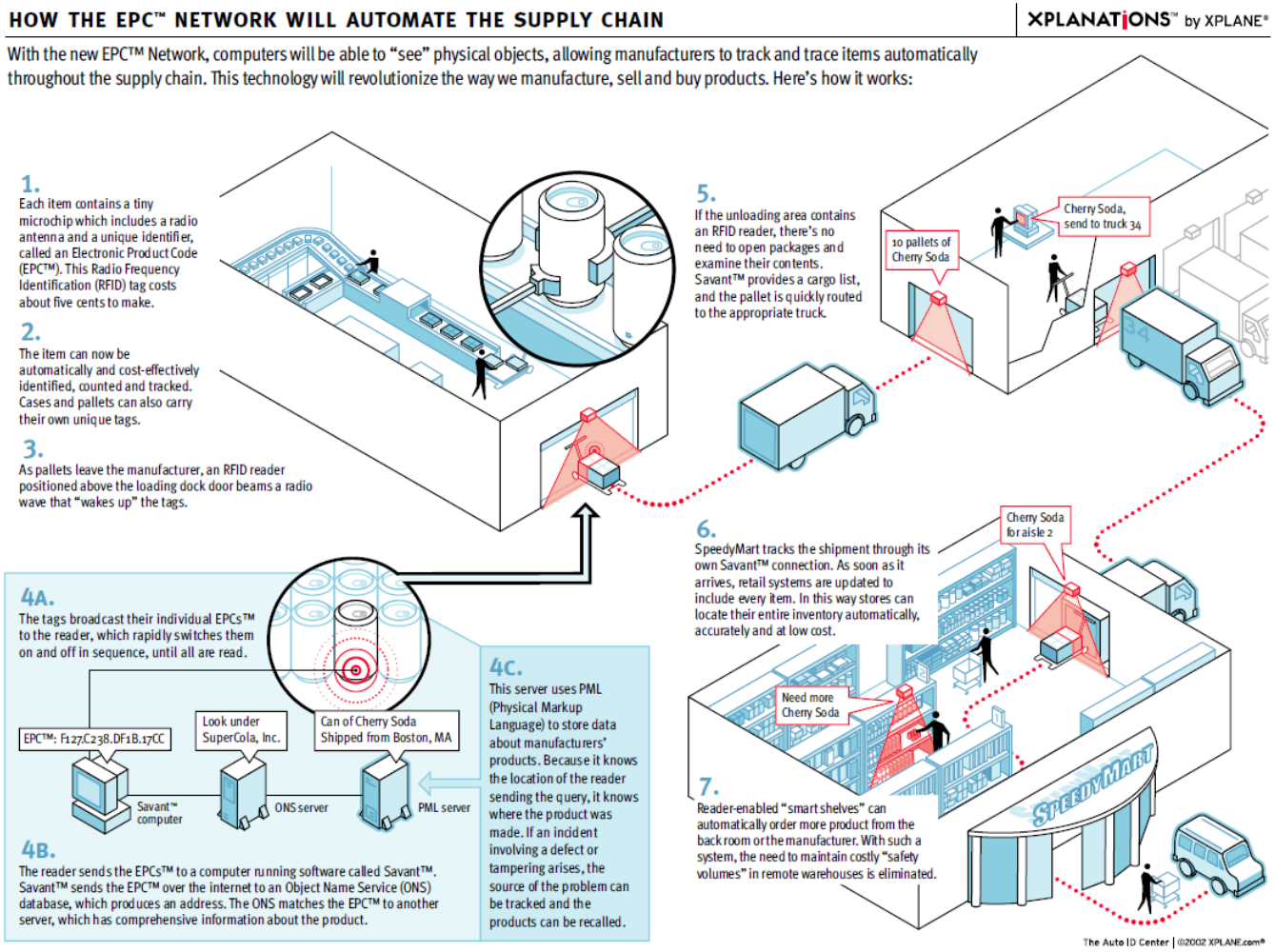
	1975	1997	Factor
"Hard" benefits*	3.13	3.45	x 1.1
"Soft" benefits**	0.29	3.44	x 12
Cost	2.50	1.25	x 0.5
Net benefits	0.92 (USD 0.1 bn)	5.64 (USD 16.4 bn)	x 6

* Main benefits: Faster check-outs, reduced check-out errors / loss prevention, elimination of price marking

** Main benefits: Automatic reorder, shrink control, improved warehouse operations, improved DSD control, inventory reduction and sales increase

Source: PwC, in: Haberman (1999)

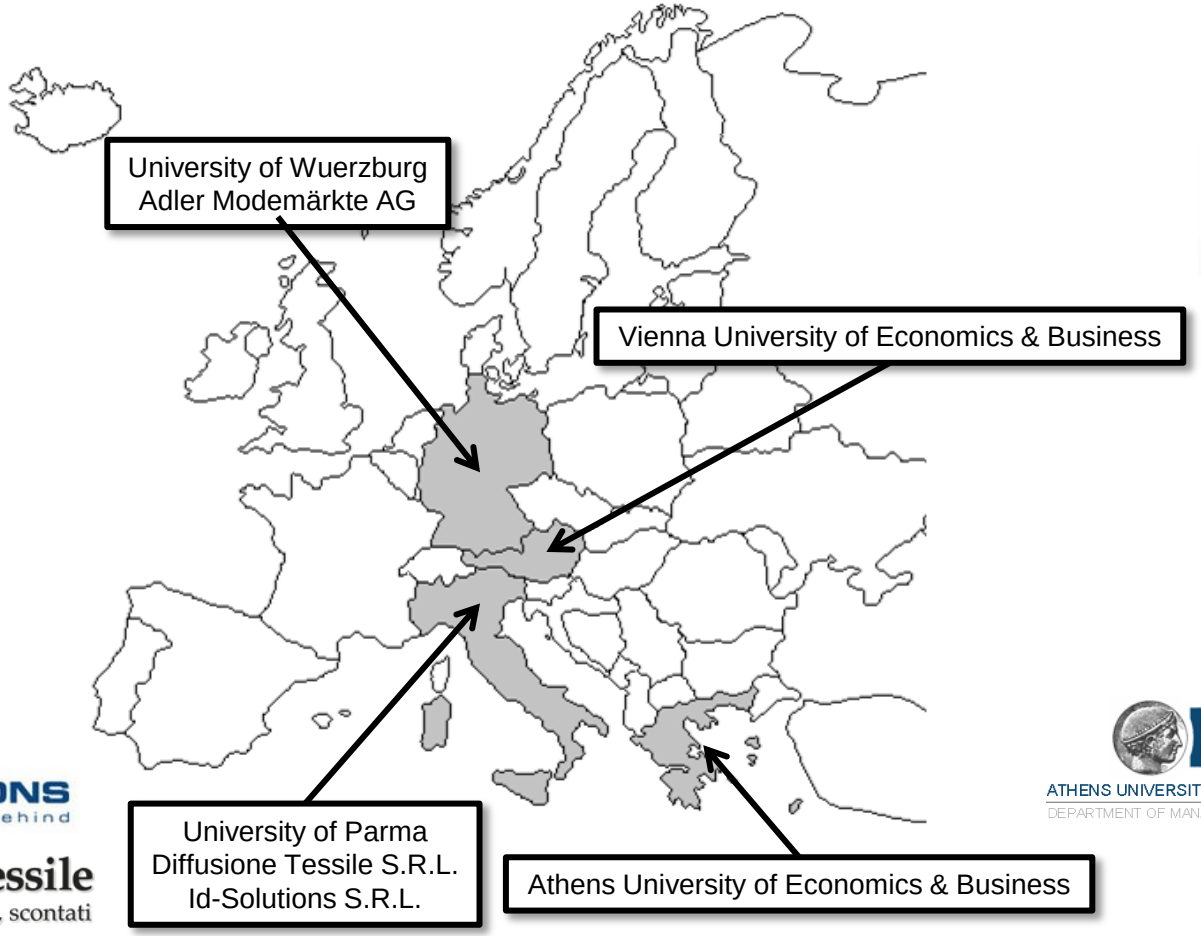
RFID – the "next generation barcode"?



What is SERAMIS?

- A 'small/medium scale focused research project' (**STREP**)
- Funded by the **European Commission**
- Total EU contribution: 1,992,000 €
- Adressing the strategic ICT objective 'Digital Enterprise'
  - Call for '**Applications for the Sensing Enterprise**'
- Vision:
  - **Continuous awareness** and
  - **improvement of business operations**
  - in a **digital environment**
- Expected impact:
  - **flexibility and productivity**
  - by incorporating **data from smart sensors**
  - directly into **business processes**
- Duration: 36 months starting on May 1st, 2014

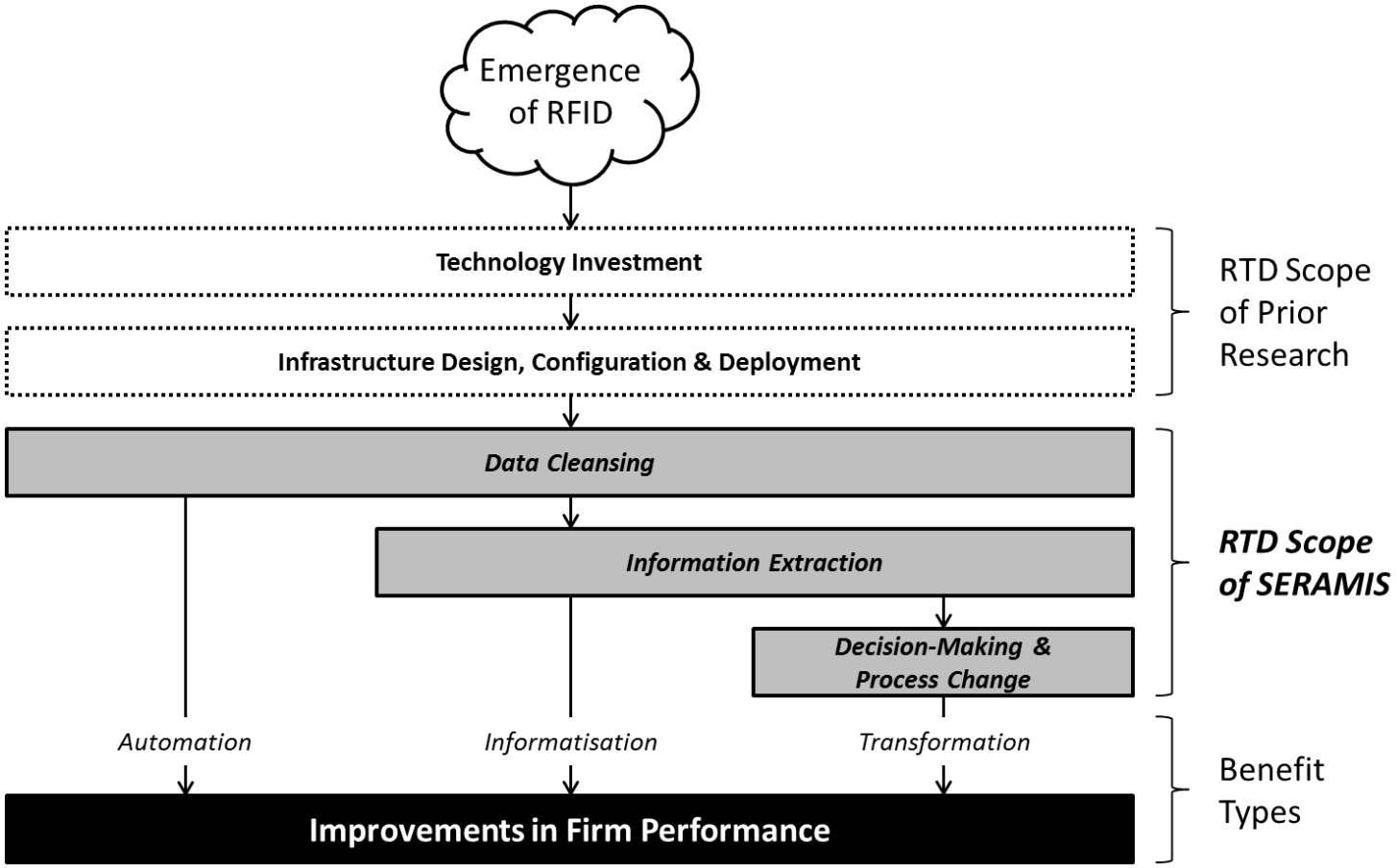
SERAMIS partners



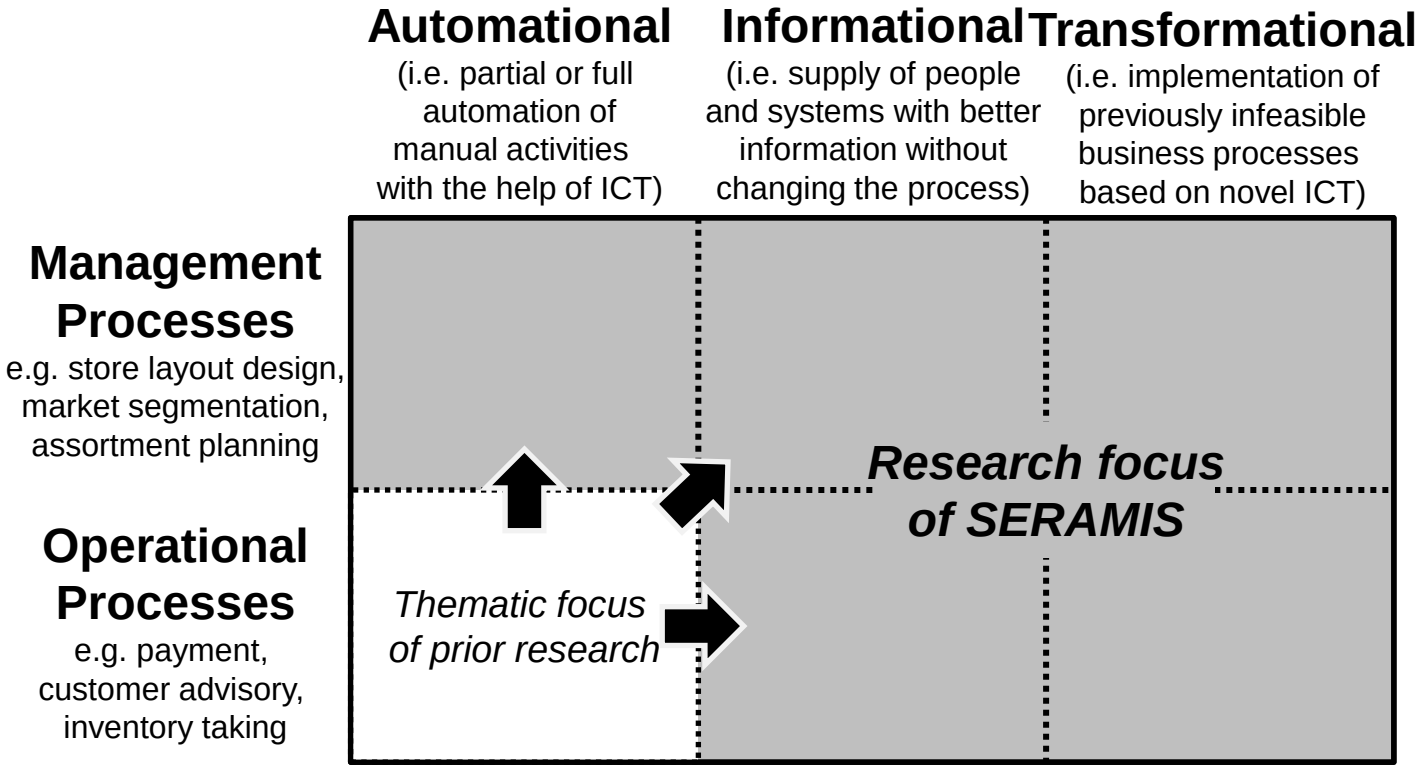
What is our mission?

The objective of the SERAMIS project is **to push the boundaries of current RFID implementations**, thus turning them into powerful tools for intelligent information management. For this purpose, **SERAMIS develops models, procedures, and tools for the handling of massive RFID data sets**. The project aims at covering the entire causal chain from the initial investment in an RFID data collection infrastructure to the impact of data processing on firm performance and customer satisfaction. Not least, SERAMIS puts **special emphasis on the analysis of privacy issues** arising from RFID data. The project results are put into practice by two leading European fashion retailers and innovators in RFID usage. Our ultimate aim is to create **benefits for individual business processes, strategic and industry-level impacts** as well as **guidelines for handling the trade-off between the interests of technology users and the privacy rights of their customers**. The project outcomes are developed for the largest reuse possible and address the needs of players in the retail industry and beyond.

Project scope



Impacts that we look for



Project objectives are reflected by five main work packages

1. Coping with the noisy nature of RFID data streams
2. Searching for information that matters in the RFID haystack
3. Understanding the impact on operational workflows and decision-making
4. Putting it all together on the IS level
5. Managing the social and political context

1. Coping with the noisy nature of RFID data streams

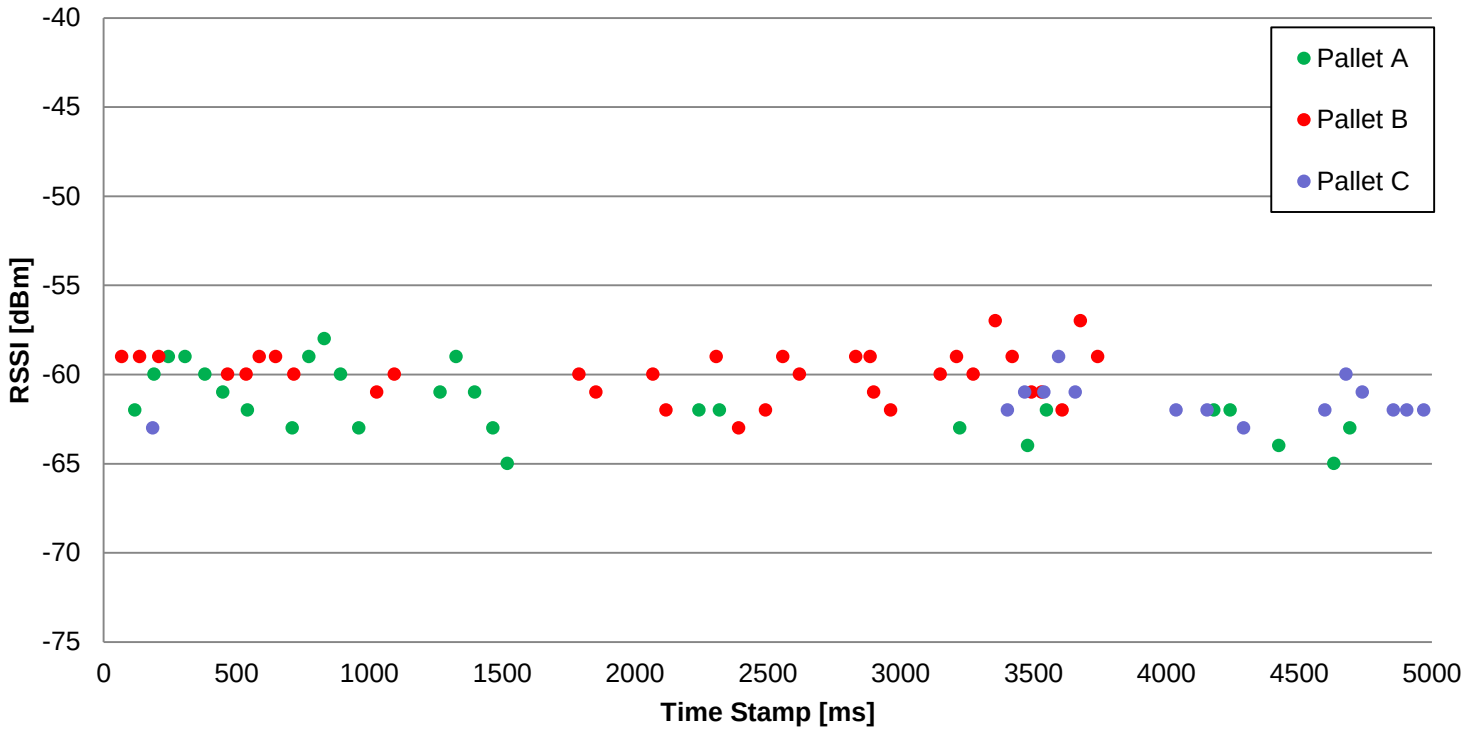
- **The physical characteristics of RF communications lead to suboptimal data quality in the form of false positives and false negatives.**

- **Low data quality erodes the value of RFID data in a variety of processes along the supply chain, e.g.**
  - DC operations (e.g. picking & loading)
  - In-store processes (e.g. misplacement detection)
  - Detection of shrinkage and theft

- **Classical statistical procedures as well as modern data mining techniques allow for synthesizing raw data streams into more meaningful, interpretable information.**

1. Coping with the noisy nature of RFID data streams

Example: False-positive tag detections for pallets moving through an RFID gate



2. Searching for information that matters in the RFID haystack

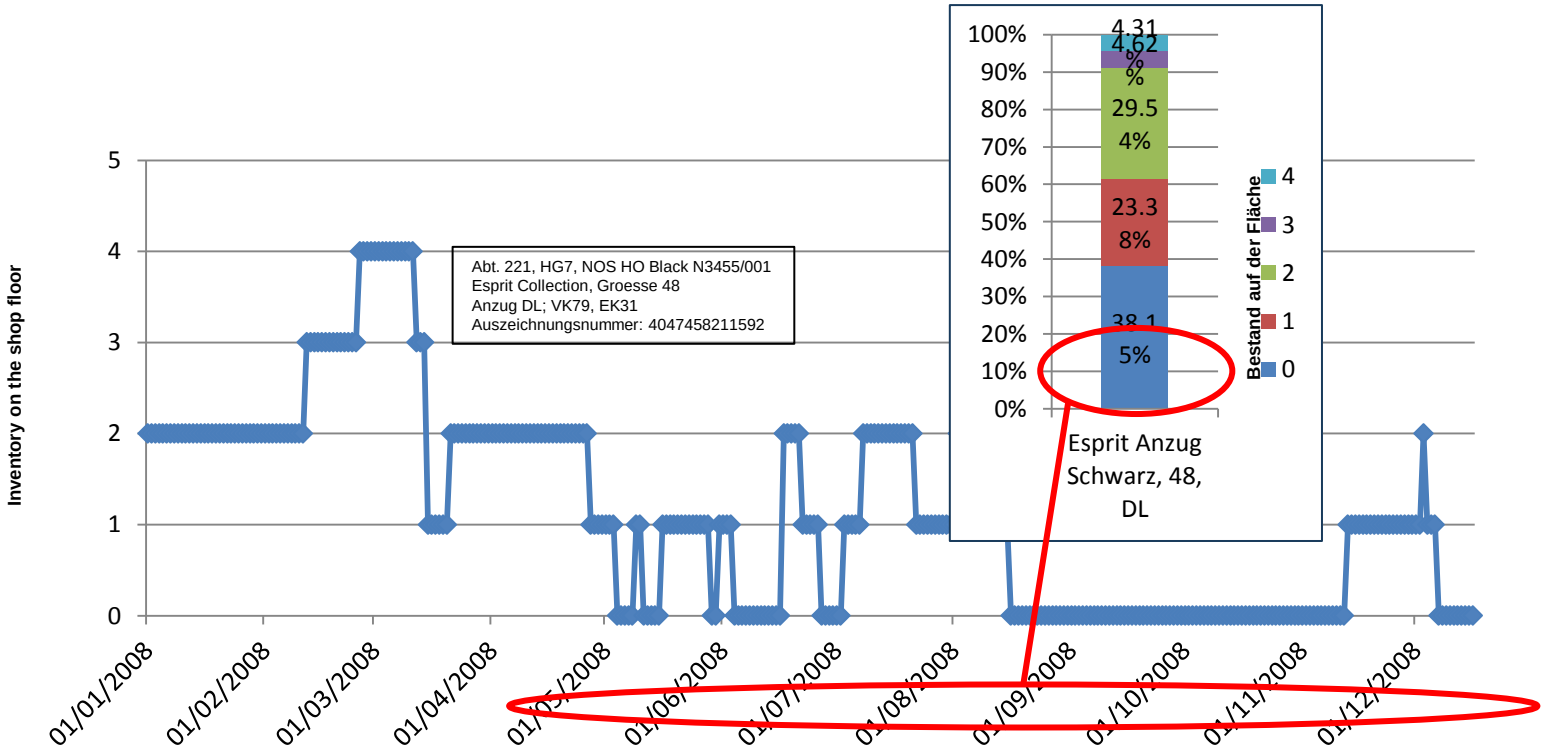
- **RFID data streams pose a novel source of managerial insights into organisational and customer processes.**

- **Similar to the barcode, RFID may become the foundation to a variety of performance indicators and management reports as well as novel customer services.**

- **Examples include**
  - logistical operations, store processes and inventory control
  - store design, assortment planning, and marketing
  - mobile, web-based, and in-store services

2. Searching for information that matters in the RFID haystack

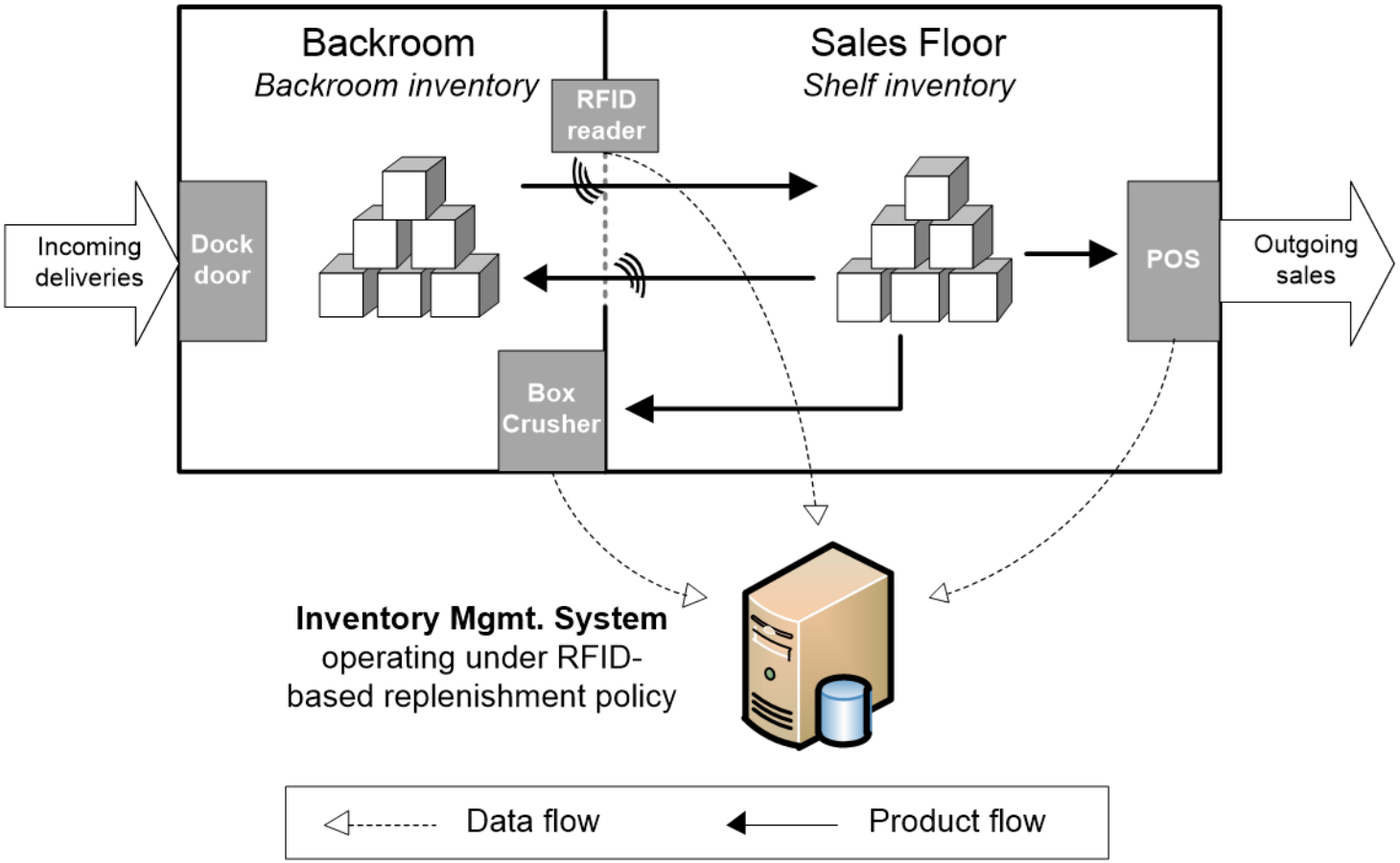
Example: Out-of-shelfs for 'Never-out-of-shelf' (NOS) items



3. Understanding the impact on workflows and decision-making

- **Beyond automational and information impacts, RFID exerts a transformational influence on the firm.**
- **On an operational level, RFID data may be used to further optimize existing business practices (e.g., ECR/CPFR).**
- **On a managerial level, RFID data may lead to more efficient decision-making processes and better decisions.**
- **Reference processes and decision models must be developed that make use of the novel data types.**

3. Understanding the impact on workflows and decision-making



4. Putting it all together on the IS level

- **Traditionally, enterprise systems are designed for the administration of real-world entities based on type identification and quantity information.**

- **The question remains of how to implement the new data, models, and processes within the existing infrastructure.**

- **In addition, RFID data may become the enabler for several novel IT artifacts, e.g.**
  - systems for supply chain / store planning and control
  - mobile applications for own staff & the customer
  - platforms that integrate the online channel & stationary retail

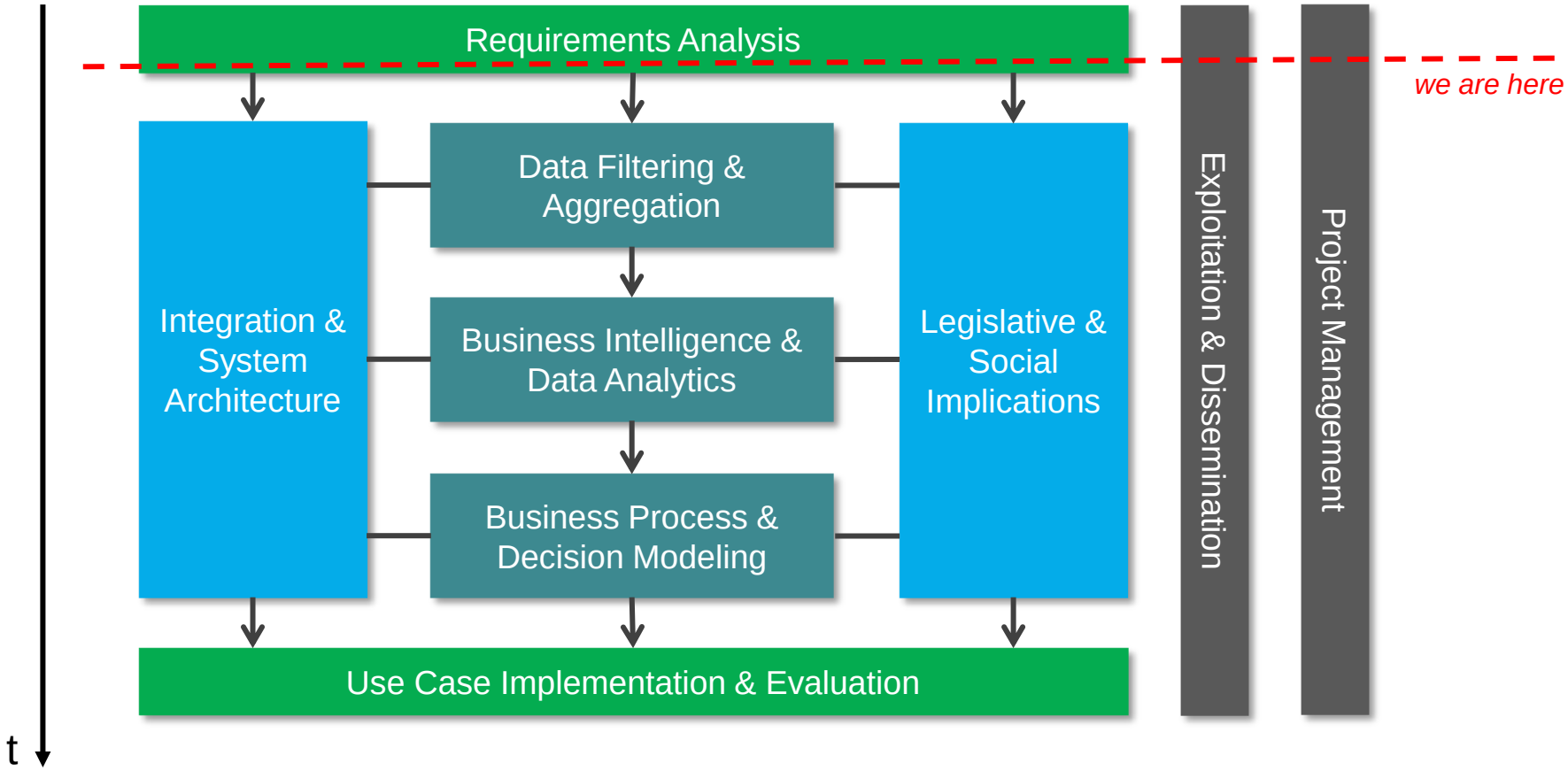
5. Managing the social and political context

- **Besides a broad range of business opportunities, the availability of RFID data sets poses a potential risk to data protection and privacy.**

- **Privacy impact assessments (PIA) of productive RFID installations are mandatory in the EU since 2011.**

- **However, the question of how PIA processes should look like and how systems could be implemented that preserve privacy „by design“ is still an open issue.**

What's next?



Updates, reports, announcements, etc. may be found at **www.seramis-project.eu**

Thank you!

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