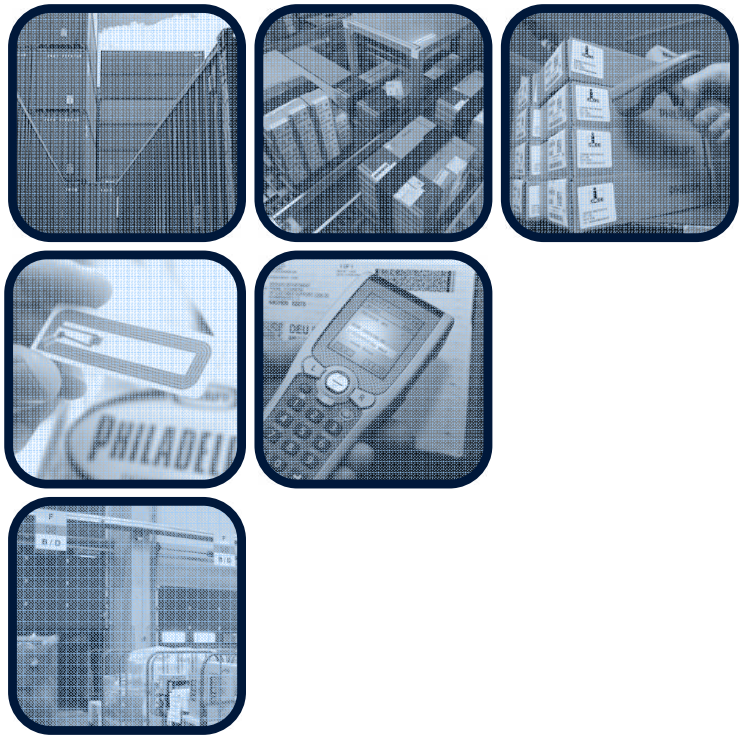

Opportunities of AutoID in the Aviation Industry

Ifm Aerospace ID Forum 20th June 2007
Cambridge UK

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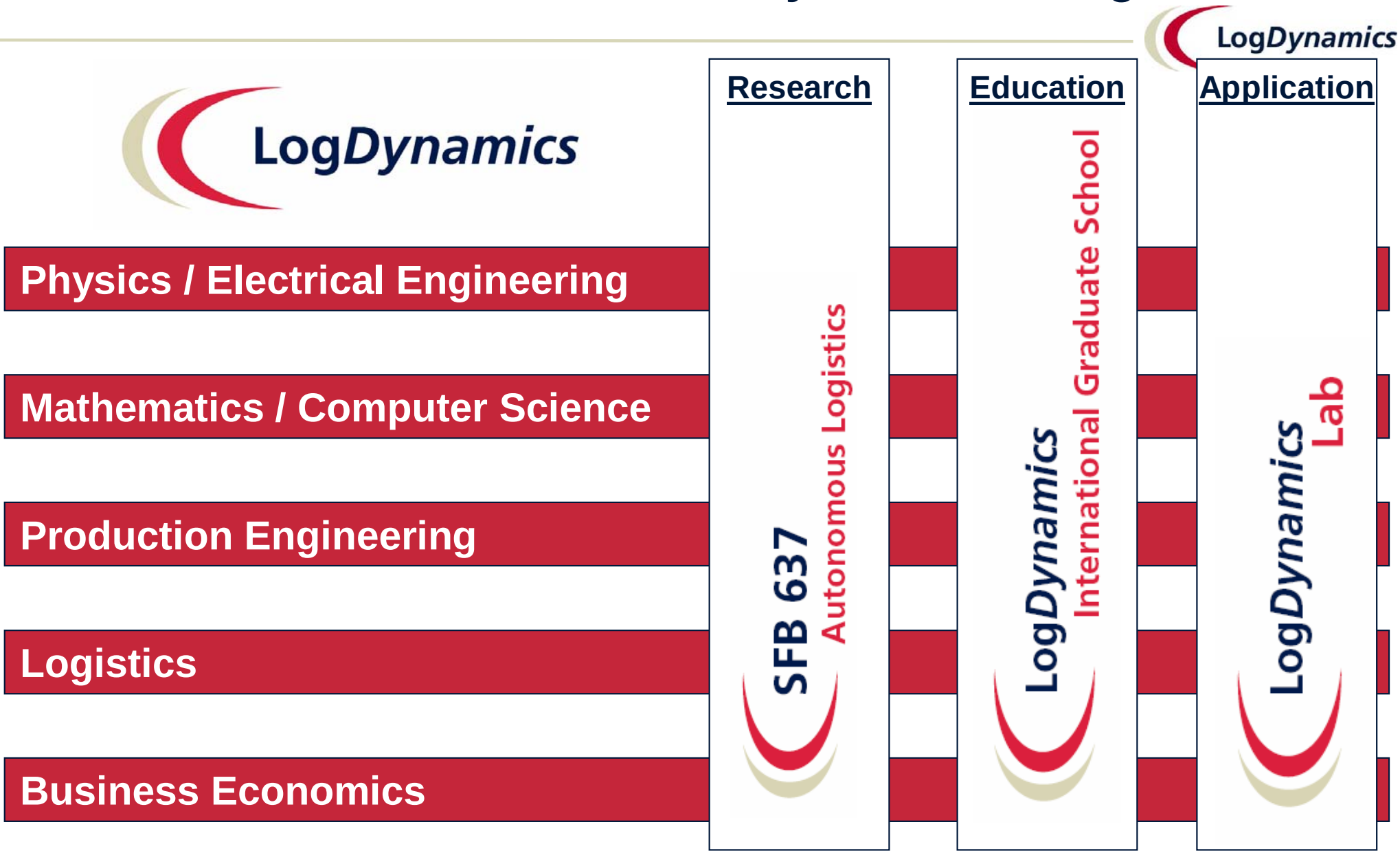
University of Bremen, LogDynamics Lab, BIBA-IPS
Email: gor@biba.uni-bremen.de

University of Bremen

- The University of Bremen was founded in 1971.
- Research and teaching are characterised by interdisciplinary as well as practice-oriented project studies - known as the „Bremen Model“ - which enjoys a high degree of acceptance in the academic world as well as in business and industry.
- As the centre of science for North West Germany, Bremen University is a place of research for 1,700 scientists, a place of study for nearly 22,000 students, a place of work for more than 1,100 employees.
- The University has 12 Faculties representing various sciences, among them the Faculty for Production Engineering

Bremen Research Cluster for Dynamics in Logistics



BIBA

Project Details - feasibility study -

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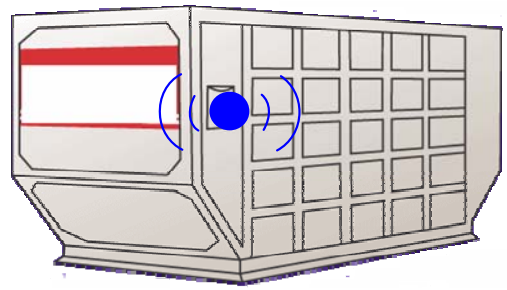
Research Issues:

Analyse RFID UHF smart label technology for container / palettes identification in airfreight logistics

Content

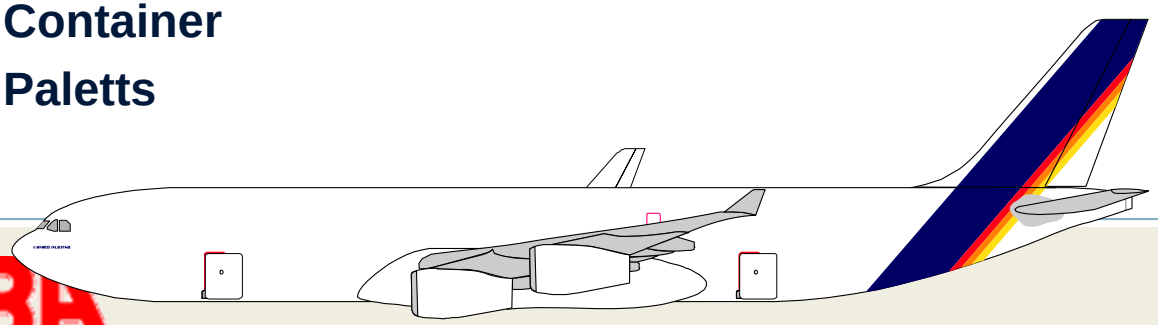
1. Creation of concept paper for RFID test setup and test approach
2. Tests of RFID UHF systems in the airfreight environment
3. Documentation of the research results



Picture of airfreight container

Case scenarios:

1. **Container**
2. **Paletts**



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Objectives

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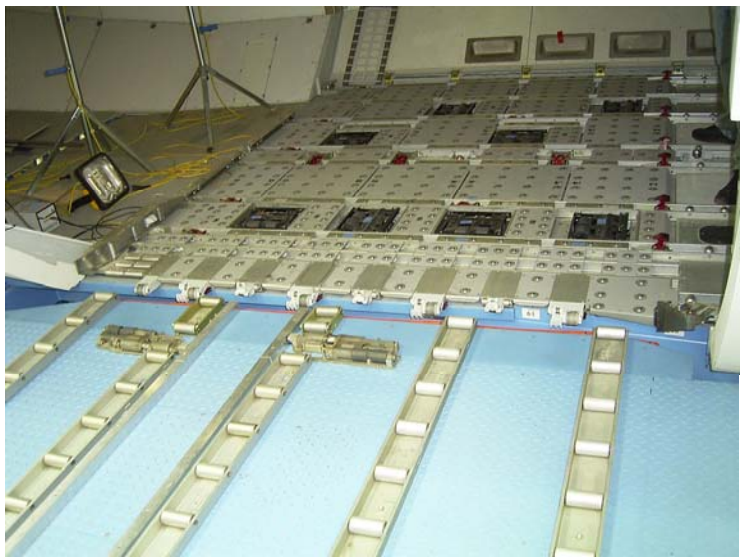

Project Objectives:

1. Find the optimal position of read/write antennas
2. Compare and evaluate different transponder positions on ULDs and pallets
3. Assure needed and possible read range correspond

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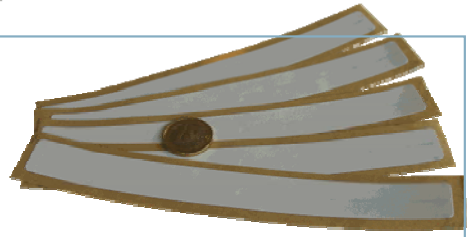
Used RFID Hardware

UHF Antenna
- Circular polarized antenna 868 MHz
- Gain 7dBi
- Dimensions: 245x235x40mm

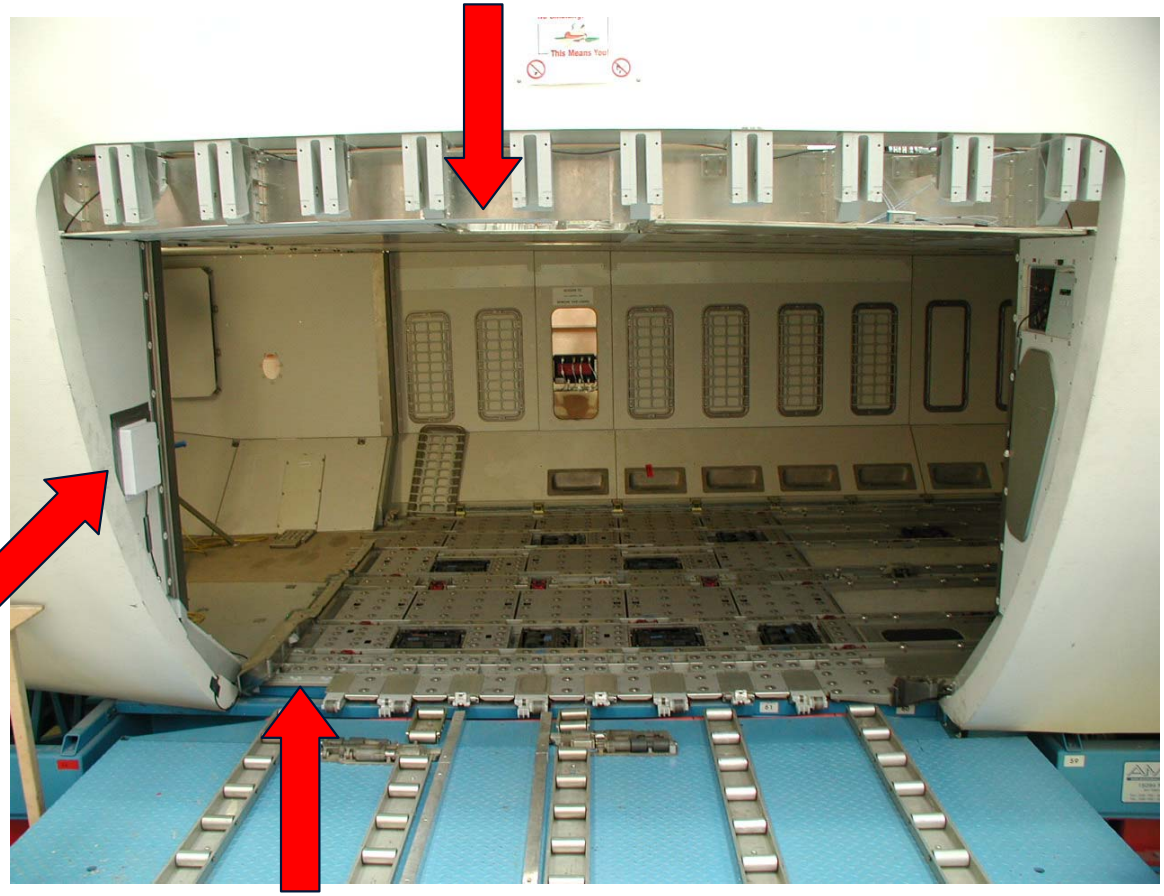
UHF Reader YS-RDU-9320 v2.7
- Frequency 868 MHz
- 4 antenna ports (SMA port)
- RF power 16mW – 3W
- Interfaces: RS 232, RS 485, Sub-D, LAN



RFID Transponder
- UHF Inlay
- Philips U-Code HSL
- Temperature range -40°C to +80°C

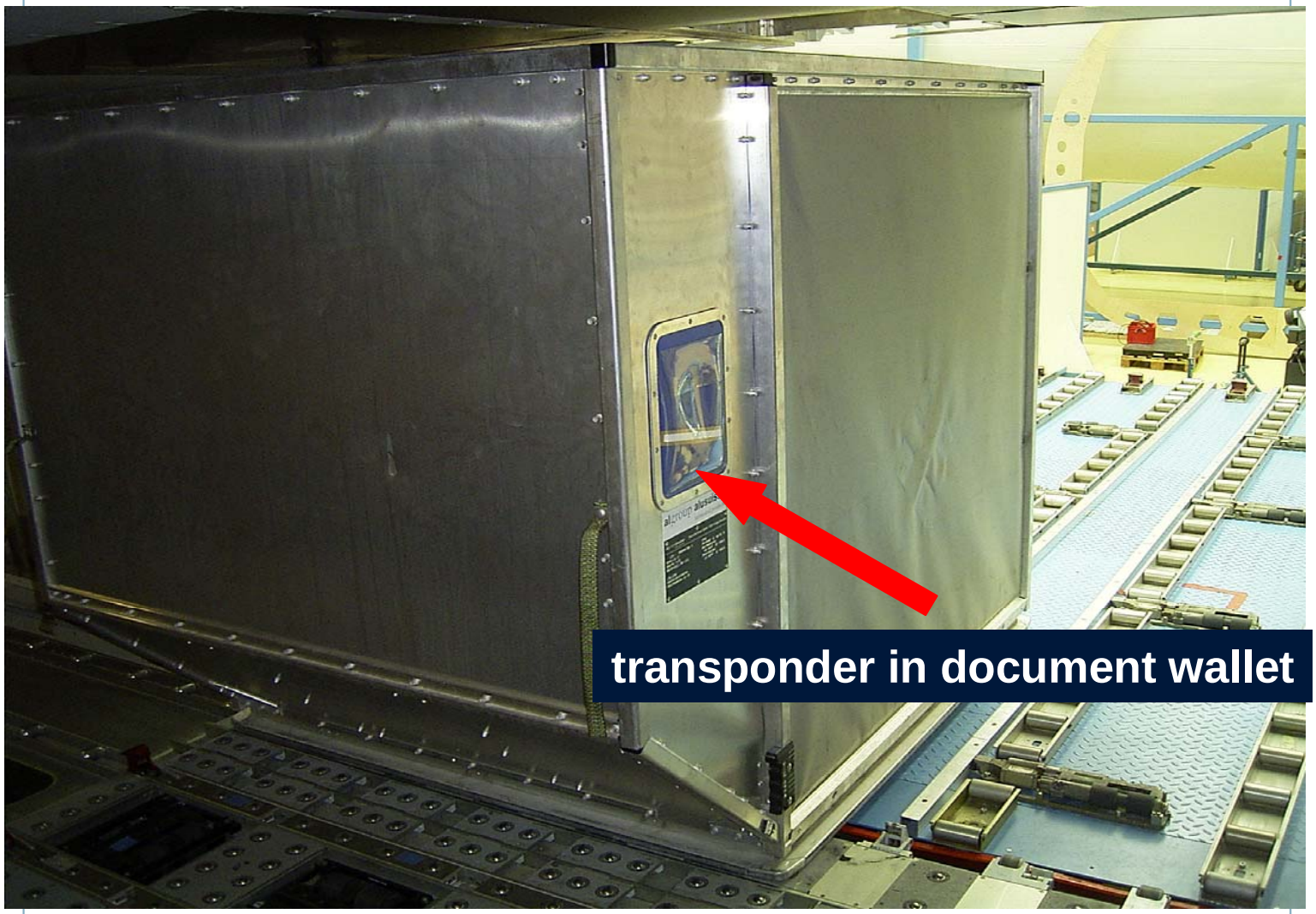
RFID Transponder
- Paxar Space tag
- Smart label for metal and fluids environments

Antenna Positions



A1: for container identification
A2: for palettes identification
A3: for container identification

Pictures of Test Procedure



Pictures of Test Procedure

RSSI based system

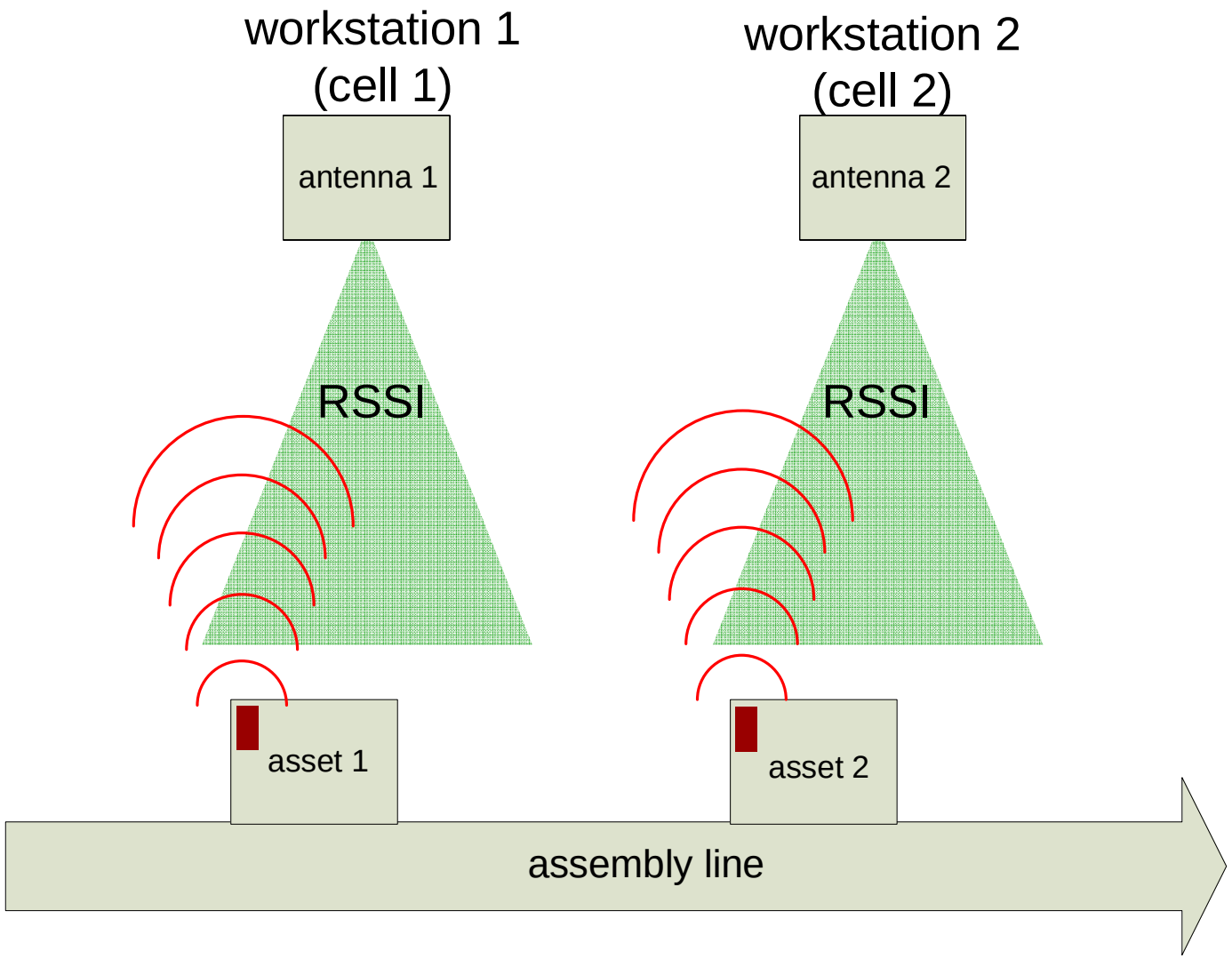
- Measurement of “Received Signal Strength Indicator” (RSSI) of backscatter signal in order to indicate the distance to next workstations

- Integrated in a slow production line with linear movement

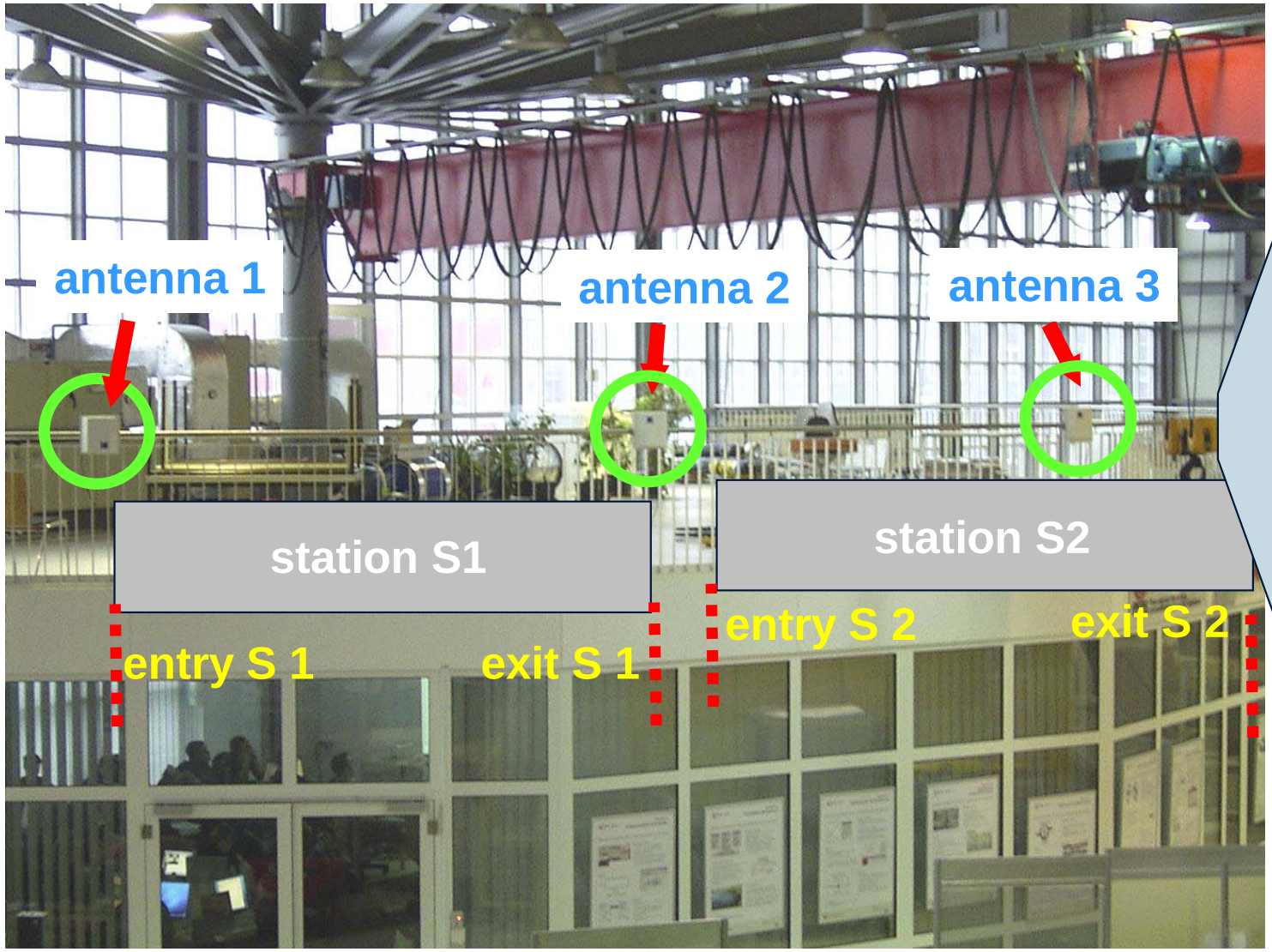
www.meshedsystems.com

http://www.rfid.caen.it/rfid

RSSI based system

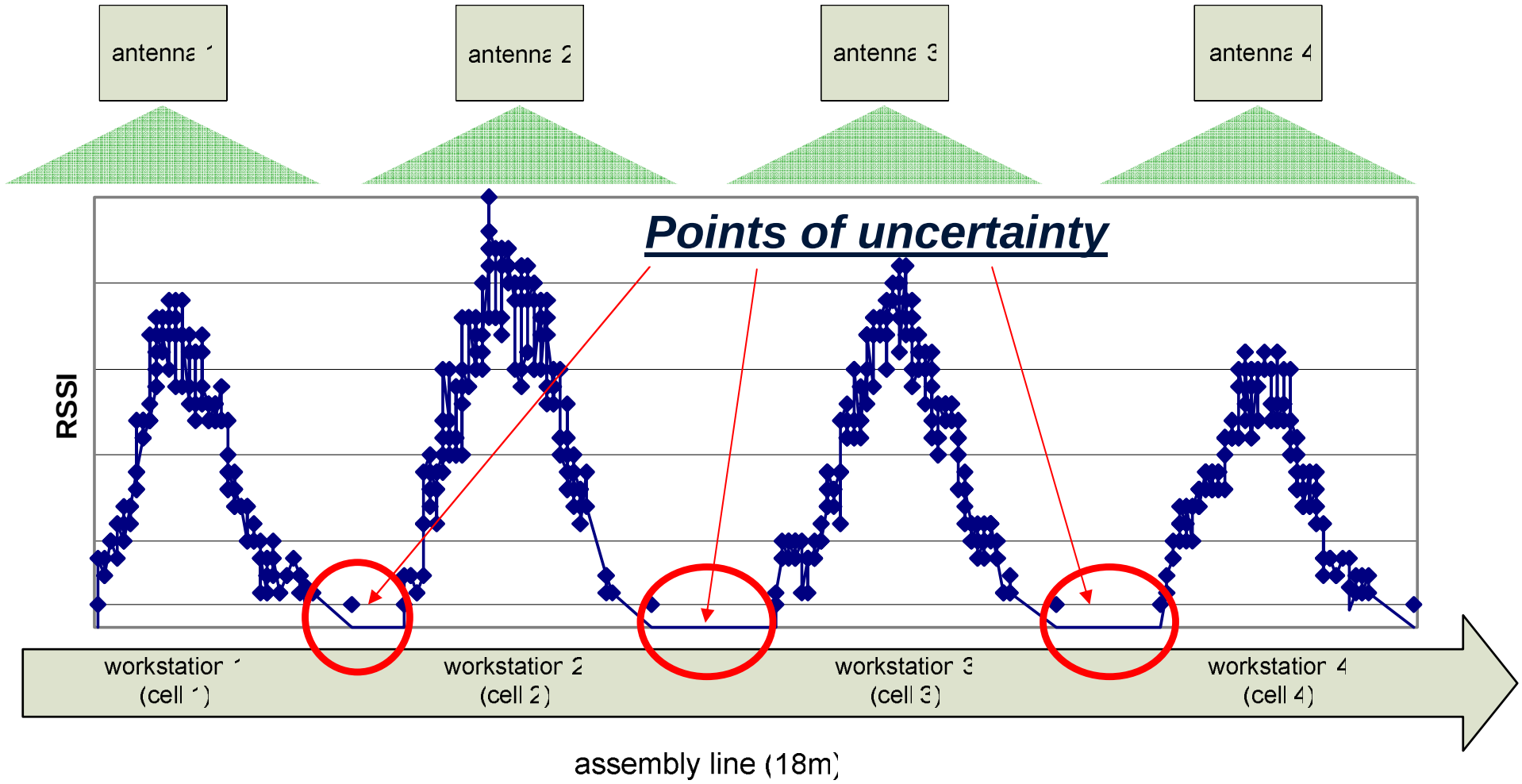


Setup at the LogDynamics Lab

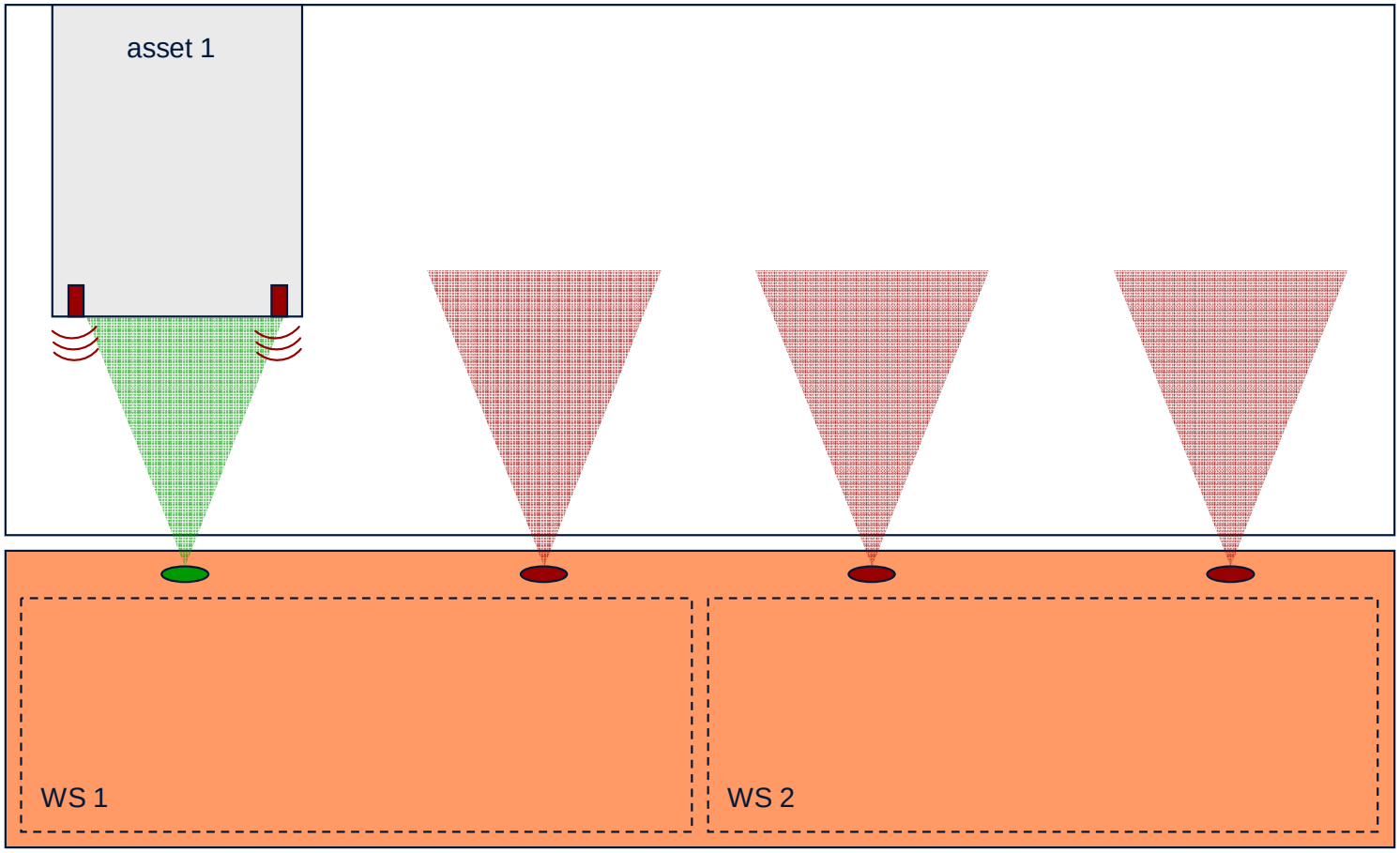


Setup at the LogDynamics Lab

RSSI as indictor for distance to the antenna



Utilizing passive RFID for locating (CoO)



RFID-antenna (including range) RFID-transponder workstation

RFID Applications in Logistics Processes in Consideration of SME

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Content of research:

Identification of potential as well as applications of RFID technology in logistics of small and medium-sized enterprises.

Objectives:

1. Analysis of status quo, obstructions and additional value of RFID technology within the scope of a survey
2. Development of a to-be concept to introduce RFID in SME logistics
3. Exemplary implementation of this concept on the basis of a demonstrator

Analyzed scenarios:

1. Production logistics
2. Warehouse logistics

Partners:

FRANCOTYP-POSTALIA

JOKE

Sponsored by:

Stiftung Industrieforschung

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Survey about RFID Implementation in SME

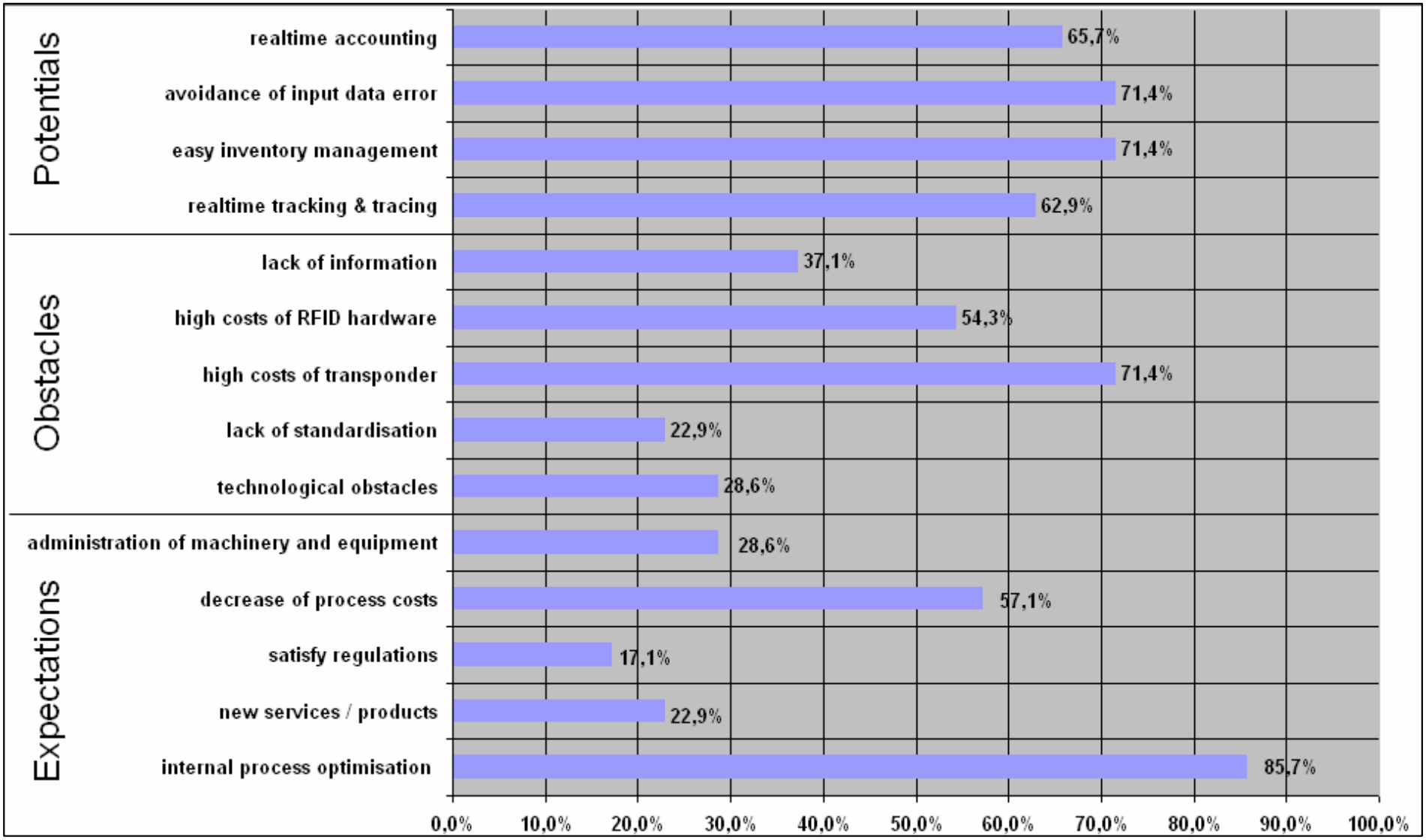
- Scope
  - Interview with 150 SME
  - Replies from 35 Enterprises (online questionnaire)
  - Return rate 23%

- Branch overview
  - 43% shipper & logistics
  - 29% industry
  - 11% retail
  - 3% package delivery service
  - 14% others

- Opportunities
  - 82% of the interviewed enterprises could imagine to implement RFID

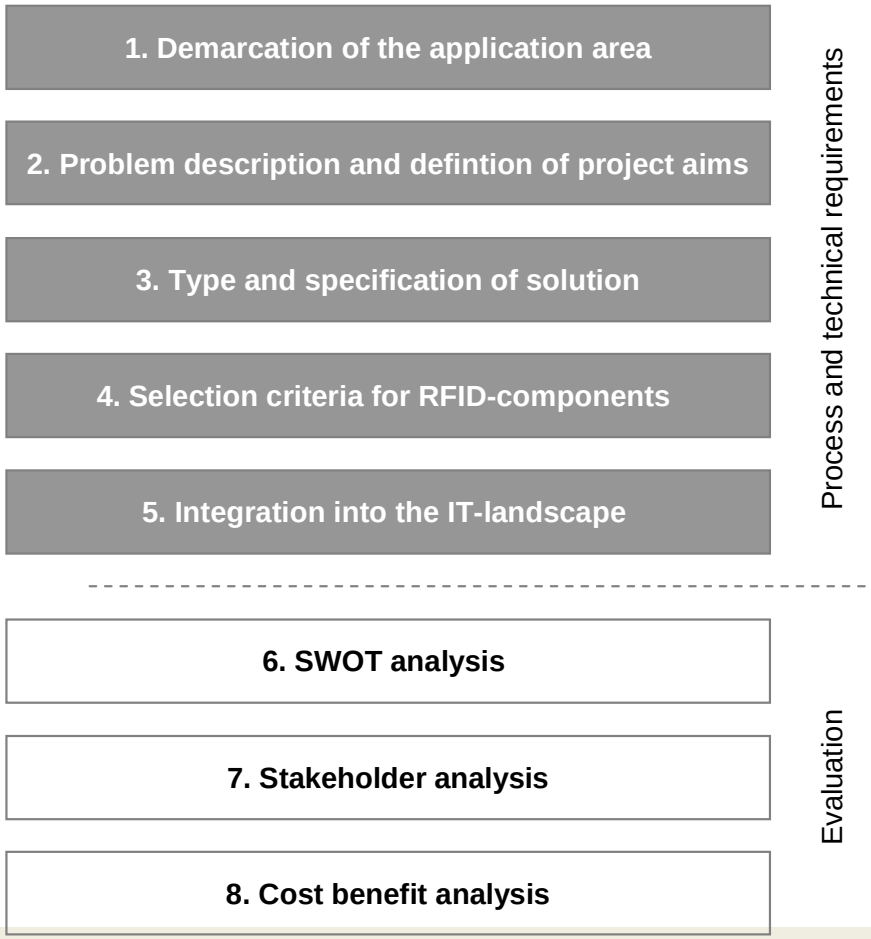
- Obstacles
  - High costs
  - Lack of information

Expectations, Obstacles, Potentials



Planning Handbook

- Deduction of universal criterias which are relevant for the implementation of RFID in small and medium-sized enterprises



→ realization:

HTML/ web based planning handbook

RFID Projects in Co-operation with (SM)E

LogDynamics

non-standard processes

- Possibility of identification of objects using radio-frequency-identification is already known

  → **RFID transfer to new fields of application** increased rapidly in the last years

- no **plug `n` ident**

- elaboration of **case studies** or **realization of pilot projects** meaningful

- **knowledge** and **method competence** as a result of complex planning and problems are necessary

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The Global RF Lab Alliance (GRFLA)

Creating a network of excellence among international RF Labs

- The GRFLA is confederation of RF-focused labs
- Purpose is to provide a mechanism for communication and collaboration among RF labs
- GRFLA members share resources, such as students and professors, and collaborate (as appropriate) on research projects
- Each participating lab will maintain its own identity, yet hold membership in the GRFLA

Founders

- Asia
  - Chinese Academy of Sciences' Institute of Automation (CASIA)
  - Hon Kong University of Science and Technology
  - Pusan National University
- Europe
  - University of Bremen
  - University of Parma
- USA
  - University of Arkansas
  - University of Florida
  - Georgia Institute of Technology

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CASIA

香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

PUSAN NATIONAL UNIVERSITY

Universität Bremen

UNIVERSITÀ DEGLI STUDI DI PARMA

UNIVERSITY of ARKANSAS
SAM M. WALTON COLLEGE of BUSINESS

UNIVERSITY OF FLORIDA

Georgia Tech Research Institute

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Global RF Lab Alliance

What is the GRFLA research focus?

- What technologies we are focusing on?
  - Radio frequency identification (RFID)
  - Real time location sensing (RTLS)
  - Near-field communication (NFC)
  - RF-based Sensors
  - Middleware and advanced data processing

- What research topics are we focusing on?
  - Supply chain automation
  - Product life cycle
  - Cold chain
  - Food quality
  - Pharma applications

- What branches and industries are we focused on? Retail/FMCG
  - Automotive
  - Aviation
  - Logistics and CEP (Courier Express & Parcel)
  - Cold Chain
  - Pharmaceutical
  - Healthcare

Take-aways?

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RFID service center bremen

http://www.logdynamics.de/
http://biba.uni-bremen.de
http://www.grfla.org

Global RF Lab Alliance

Thank you for your attention

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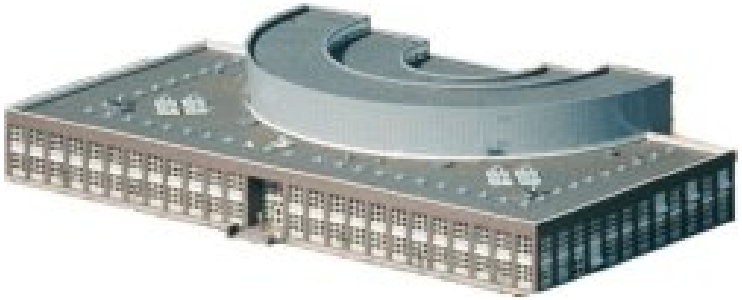

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