



RFID as a technology and as a logistics concept

Antti Permala

Technical Research Centre of Finland (VTT)

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Transport Telematics Architecture

- The national architecture system is a reference architecture through which the Ministry of Transport and Communications supports the national development of the transport telematics
- The objective of the architecture is to provide the opportunity to improve the organisation's competitive ability on the market in the form of more efficient operations, a more versatile service supply or better compatibility.
- The architecture describes open interfaces between the actors without binding them to specific technologies and without intervening in the internal systems of companies.

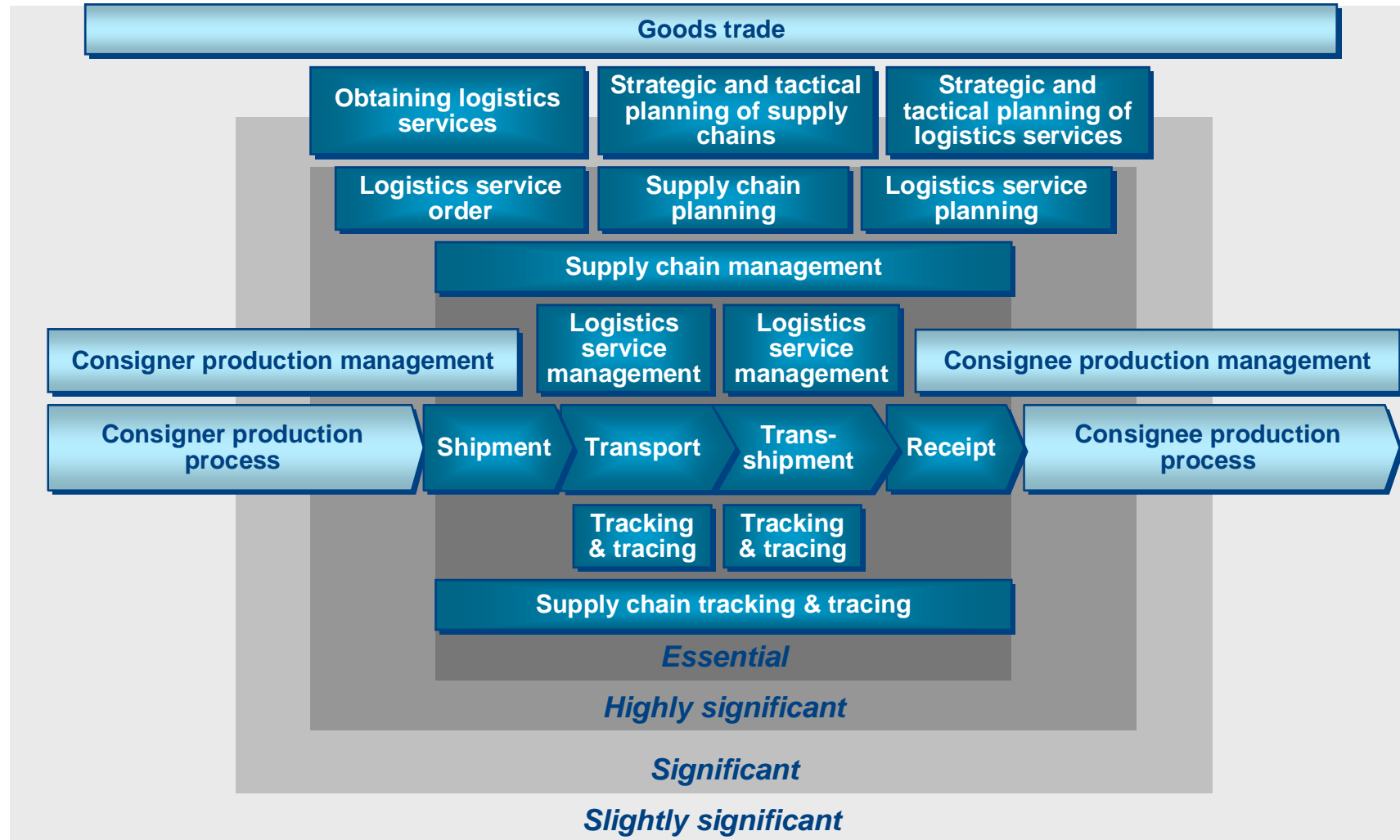
Vision for Transport Telematics Architecture

- **Real-time information about the location, contents and conditions of identified shipments, goods items, parcels and transport vehicles can be collected in a controlled manner.**
- **The collected information can be combined with planning information and refined appropriately to be used during various parts of the process and distributed efficiently and timely to actors.**
- **By collecting, refining and distributing information efficiently organizations can boost their goods transport logistics processes, lower their operational costs and improve their portfolio of logistics services.**

Transport Telematics Architecture

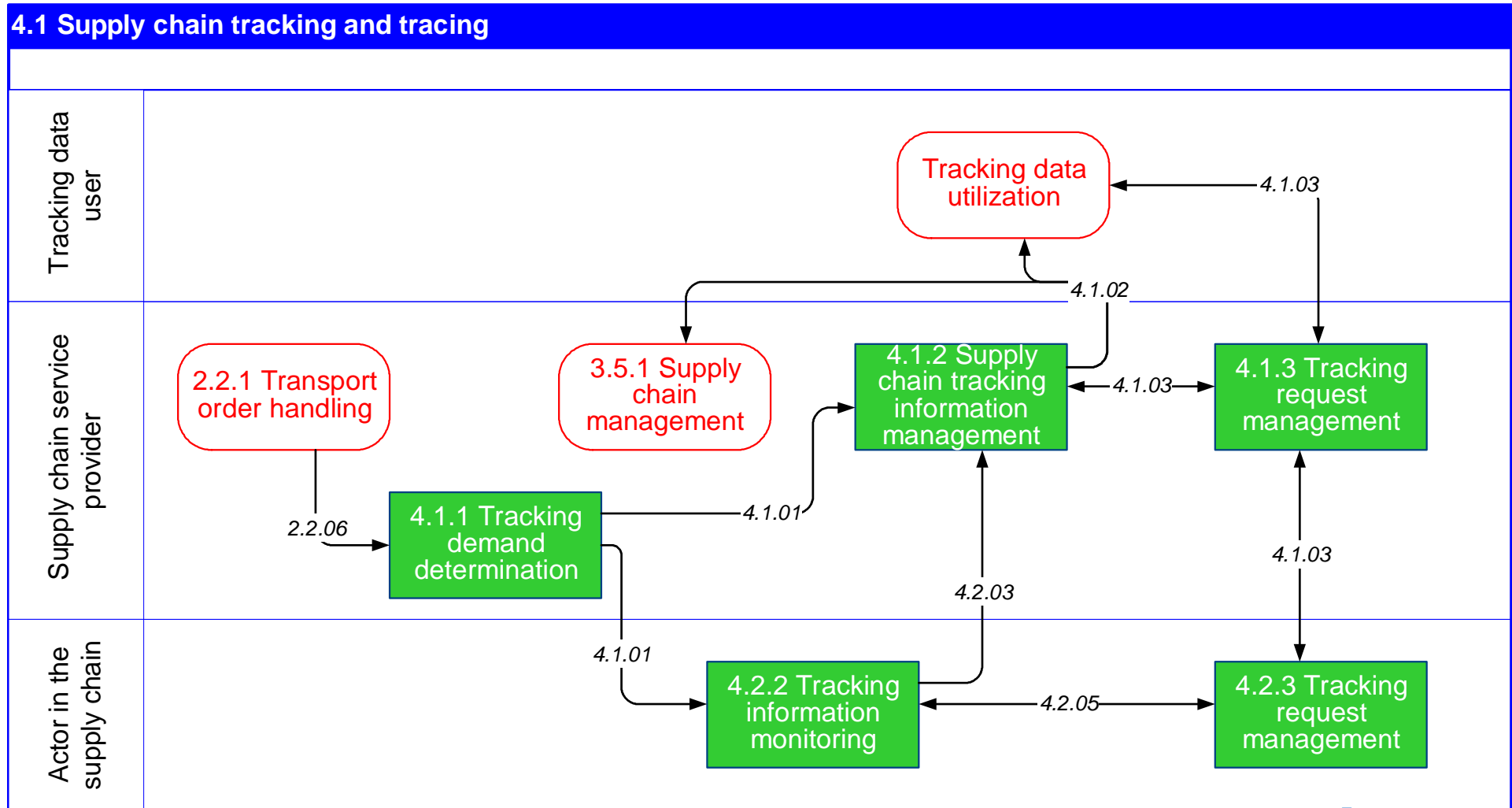
- The architecture contains role definitions for the sender, the receiver, the logistics service providers and the public administration.
- The described process areas of the freight transport are planning, management and control, supply chain operations, and tracking and tracing.
- The information flows comprise management data, track and trace data and other data related to the goods order, transport agreement, transport order, dispatch note and load specification

Logistics processes

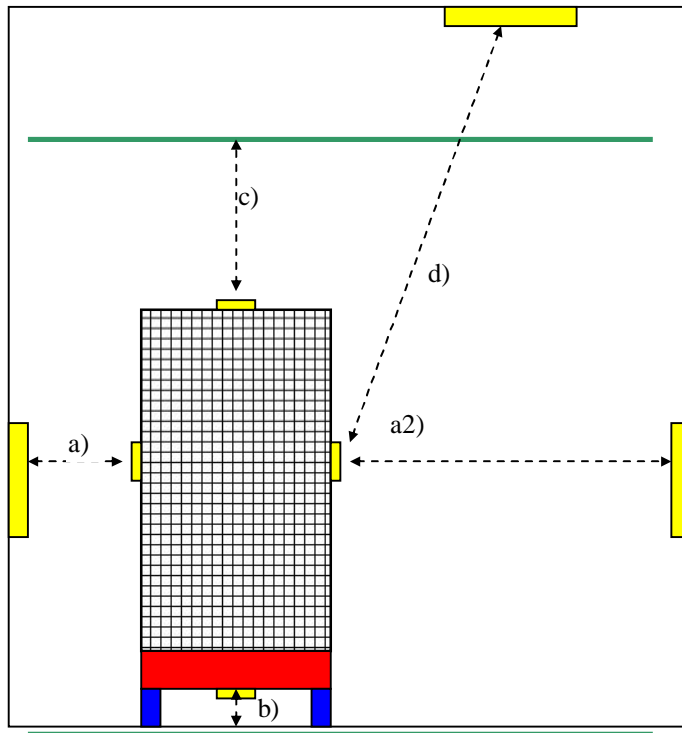


http://www.vtt.fi/rte/projects/fits/julkaisut/hanke1/fits25_2003.pdf

Process components and data flows in process 4.1 Supply chain tracking and tracing.



Electronic Supply Chain Identification with RFID

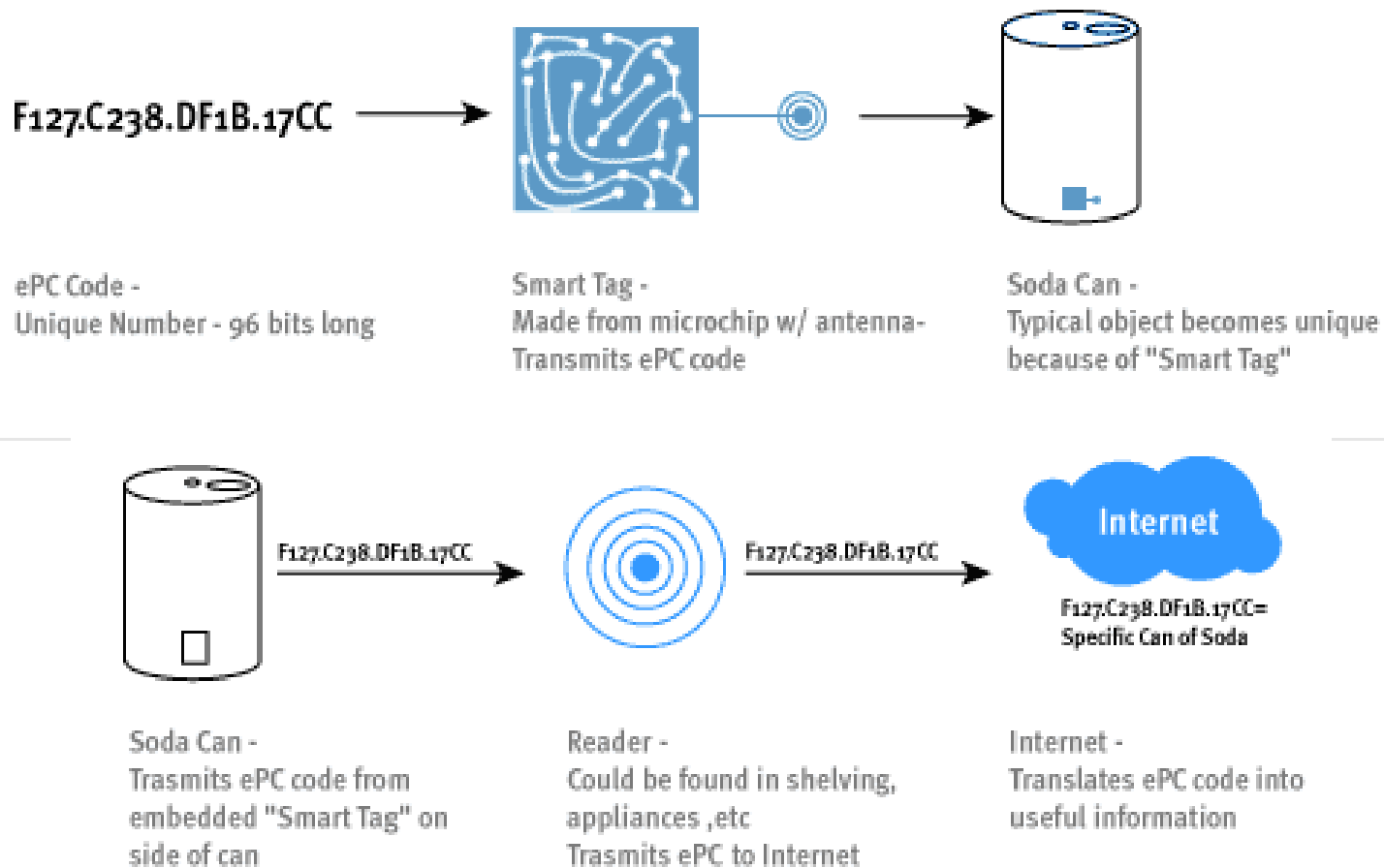


RFID models and methods are developed and identification solutions are studied


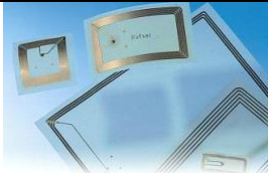




Identification and tracking of goods

- Radio Frequency Identification (RFID) will replace manual identification as well as bar code technology in many applications during the coming years
- Different types of units such as vehicles, containers, roller cages, pallets, plastic boxes and wooden boxes will be equipped with RFID tags
- The tag may contain only ID such as an EAN code, the whole transport label or even all transport documents
- Strong drivers are big global players such as Wal-Mart, Tesco, Marks & Spencer and Metro Group

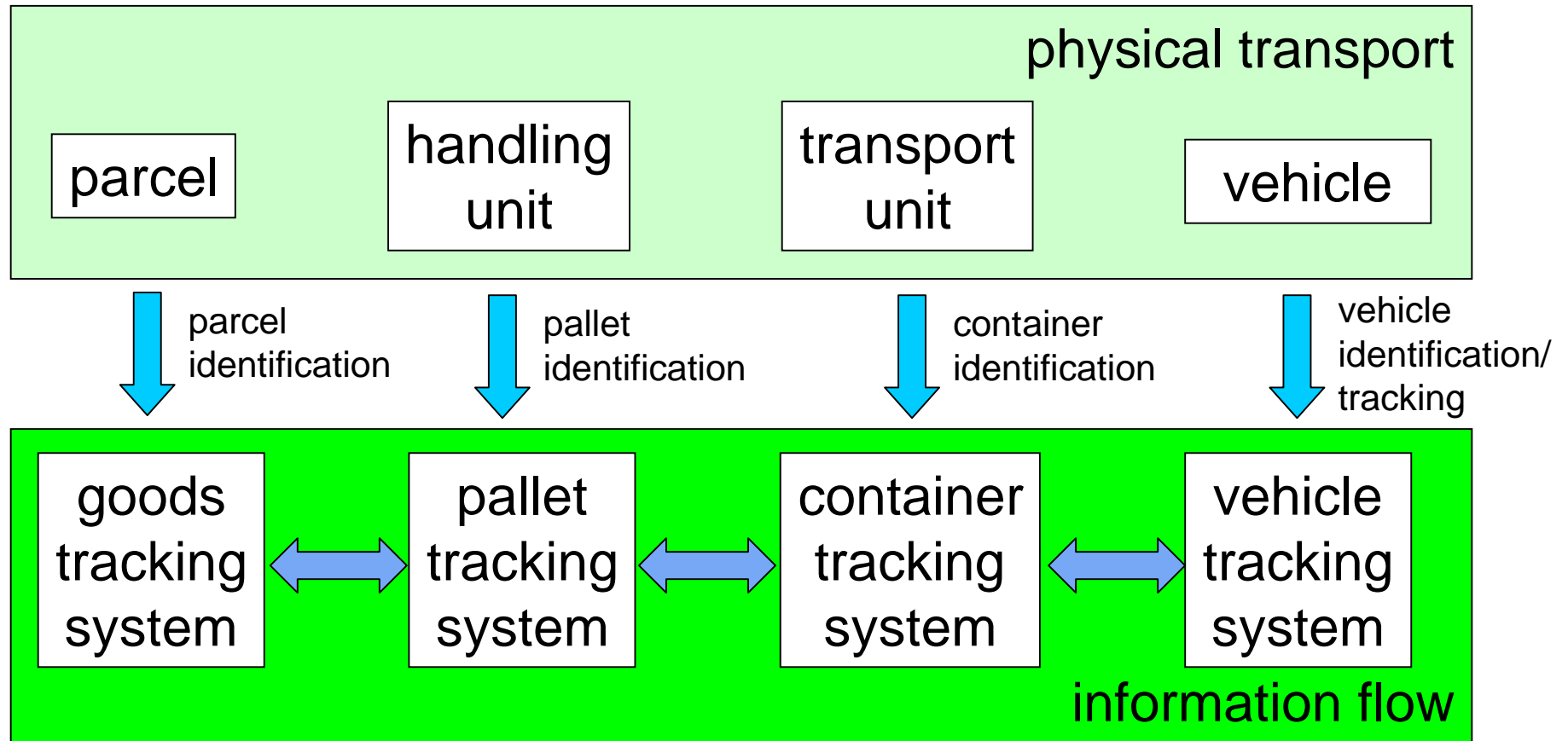
Visio: MIT Auto-ID Centre: “Internet of Things”



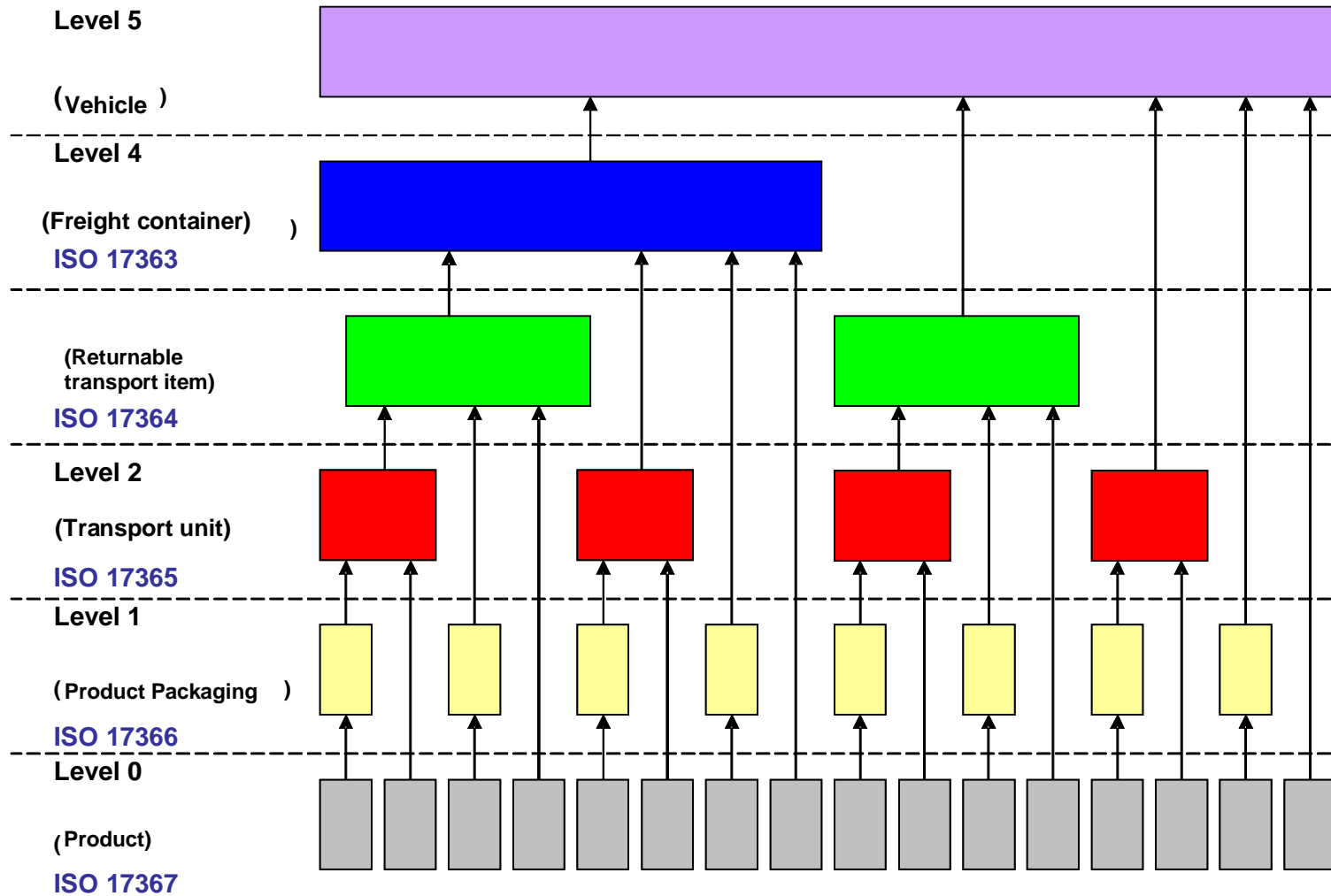
RFID technologies

	Inductive 125 kHz, 134,2 kHz	Inductive (HF) smart label 13,56 MHz	UHF smart tag 868 MHz (2,45 GHz)	UHF active tag 868 MHz (433 MHz)	Microwave active 2,45 GHz, 5,8 GHz	Chipless tag
example tags	 Tiris	 Rafsec Philips ICODE smart label	 Rafsec Philips UCODE tag	 Identec ILR tag	 Amtech tag	 Checkpoint tag
passive or active	passive	passive	passive	active	active	passive
max. reading range	< 1 m	< 1,5 m (gate reader)	3-4 m	4 - 100 m (Identec) 250 m (R-IDENT)	8 - 20 m	
price (example)	0,5 - 20 Euro	0,5 Euro	0,5 Euro	6 Euro (Technopouce) - 35 Euro	20 - 50 Euro	< 0,10 Euro
application examples	animal identification, access control	access control, consumer goods	pallet identification	vehicle tracking	access control, tolling	document security, EAS

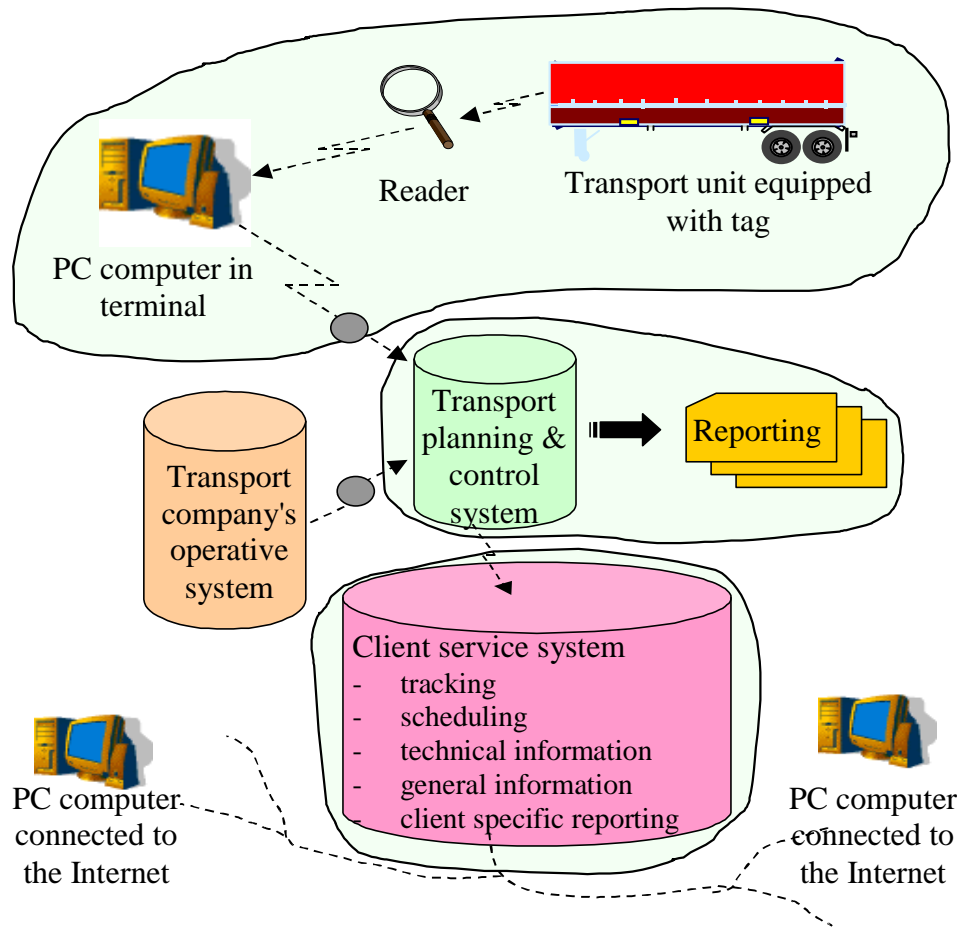
Supply Chain levels



Different tracking levels in the supply chain



Identification of vehicles with active RFID



Tag (Androdatt)



Reader



Identification of vehicles with passive RFID



Handling unit identification - case Metro

- Timetable
 - Nov 04: Start with 20 suppliers, 20 sites
 - 6/05 (est.): 100 suppliers/250 sites
 - Target: Logistics units (pallets)
 - Contents: SSCC (same as barcode)
 - Tag: Philips 1.19 Epc
 - Gen 2 when available
- 99% tag read rates in processing 50,000 pallets





Interview of 250 firms

Presented at CLM 2004 by Pete Abell - ePC Group

- Most RFID claims are skewed: Academic over-optimism, Vendor exaggeration and Vendor FUD
- Grounded in vendor & academic claims, not implementer plans and experiences, Preoccupation with proto-standards
- Almost 20% of enterprises is actively piloting or implementing an RFID solution
- ROI expectations; 26% in a year, 35% in two years
- Spend nothing (42%); RFID integration "as little and as cheaply as possible"
- Change everything (6%); reduce process costs, new applications including Information Services with supply chain partners, better, faster ROI and exception handling
- Ask, "How can *real-time information* be used to aid the business?"

Cases

- Case ABB: Tracking of Kanban boxes with suppliers
 - Success story
 - Better visibility, improved operations such as faster order impulses and exception handling, exact statistics about supplies. Result - better material control and lower inventories
- Case Wal-Mart - reported 63% - 100% successful reads - totally unacceptable - and demanded 100%
- Case paper reel: No Global RFID solutions so far

BARRIERS FOR FULL IMPLEMENTATION

- RF Technology
- RF standardisation and interoperability
- Availability of equipment and implementation
 - Integration into information systems
 - Data security
- Economical aspects
 - Requirements should be realistic
 - Fair division of costs and benefits between the partners in the value chain
 - Return on Investment - ROI

Finally

- Contributions to the last mile problem
 - Information system integration
 - RFID
- But
 - RFID is not a solution for all cases
 - For bar code the implementation took 30 years