

Technologieperspektiven: Ubiquitous Computing

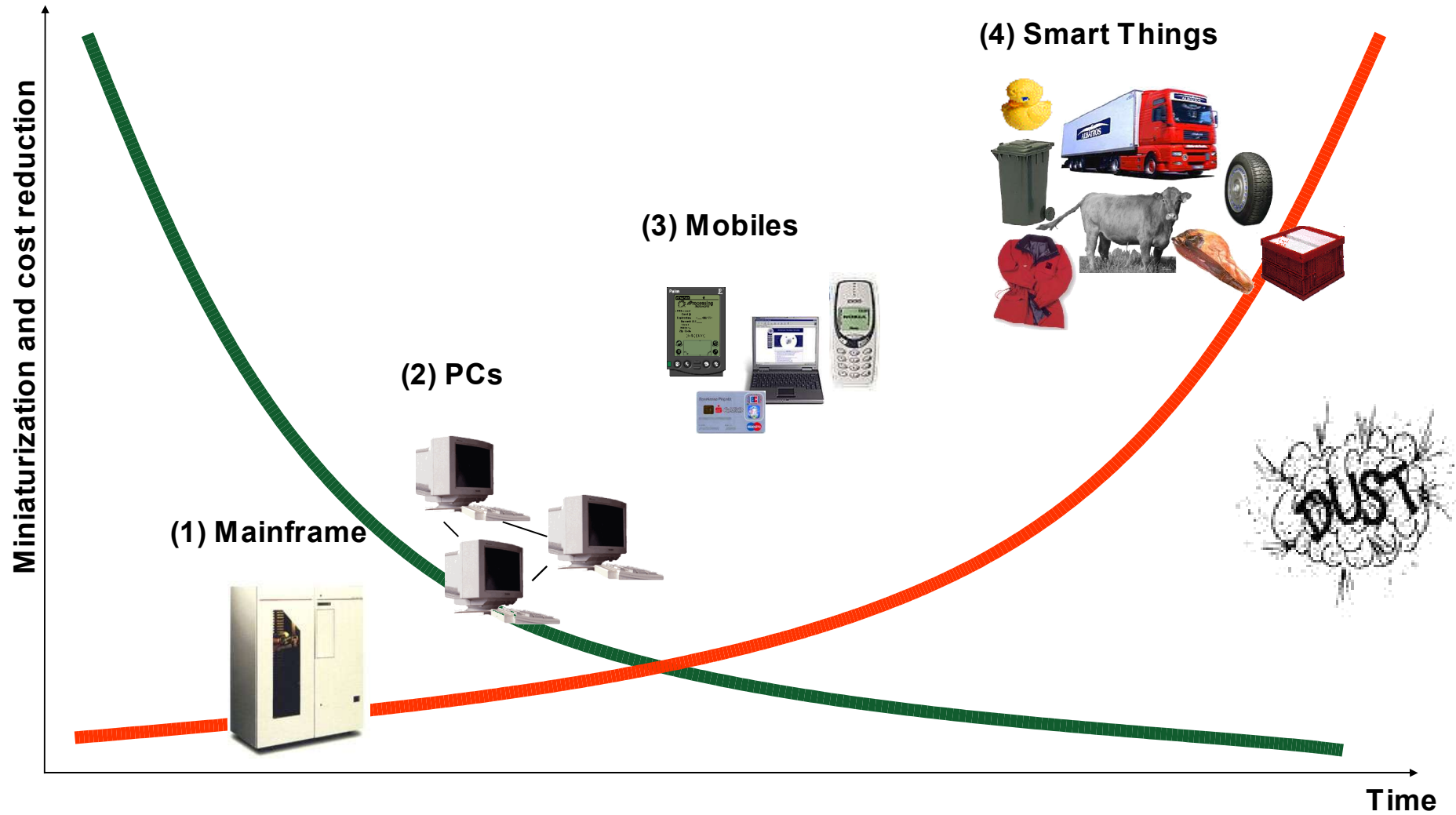
Prof. Dr. Elgar Fleisch
Institute of Technology Management
University of St. Gallen (HSG)
Research Director M-Lab
Co-Chair Auto-ID Labs

St. Galler AssekuranzForum
Bezau, 1. April 2004

Agenda

- RFID as a logical next integration step
- Applications: demonstrators, pilots, roll-outs
- Summary: Good products want to communicate

Miniaturization drives new tech development

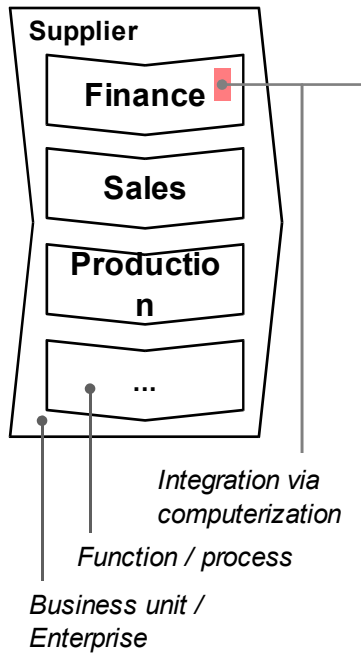


But what is it good for? No technology for technologies` sake

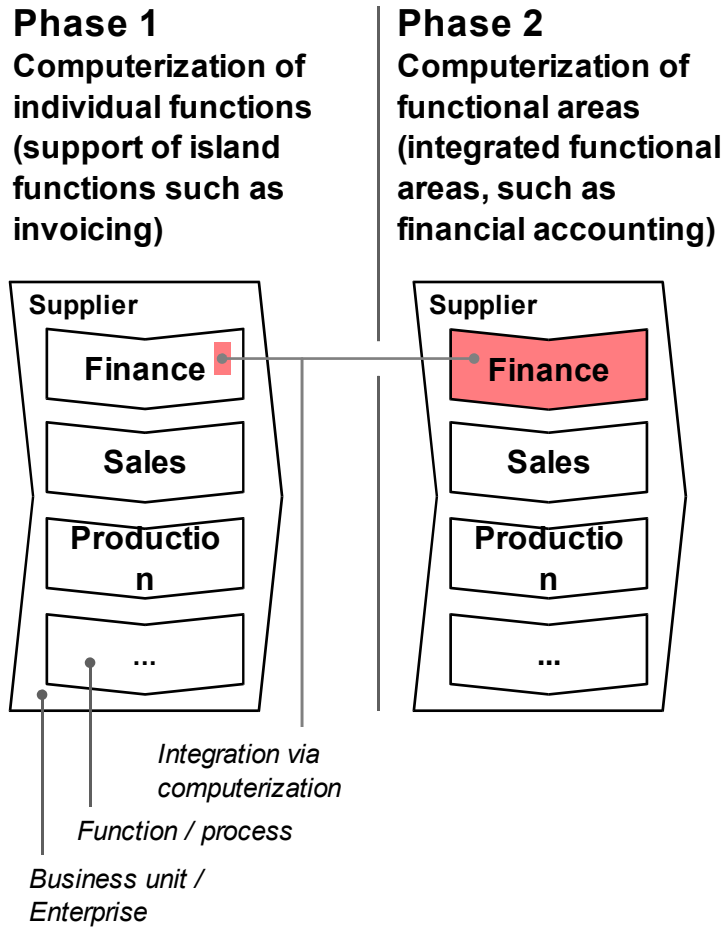


Integration won't stop here

Phase 1
Computerization of individual functions (support of island functions such as invoicing)

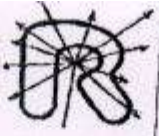


Integration won't stop here



... still bio-mechanic ...

reparalux
1, rue Gay-Lussac
BP 1453 - 29007 Brest cedex



Spécialiste terminer
Tous câbles soignés
Atelier de service
après-vente

Nombre de page 1

TELEPHONE 03 81 50 34 23
ou 03 81 50 23 87

TELEFAX 03 81 50 07 65

A l'attention de Service Fournitures Brestançon, le 16.06.00

Société: ETA

de la part de: M. BADEY

MESSAGE

Veuillez trouver ci-joint, une
commande de
5 Mouvements. Cal 201.001
H^t Aiq. 3.

10 Chauffes HT. Aiq. 1
10 Roues des heures. u 4

Cal 201.001.

Expédition: Par transport TREMAIL

Avec nos remerciements.

ETA S. A.
Fabriques d'Ébauches
Customer Service
2540 Grenchen
TEL + 41(0)31-455-0777
FAX + 41(0)31-455-0434

PELLETIER S CIE S. A. r.l.
GRAND-RUE 36
2732 RECONVILIER

Grenchen, le 16/06/2000

CONFIRMATION DE COMMANDE No. 5100-06121

N ^o /no. client:	3401 / 1705004	Date:	16/06/00
V/référence:	16.06.2000	N/référence:	DC
V/commande:	FAX No 85	N/consigne:	E
V/date:	16/06/00	N/No TVA:	103 205
TVA:	7,5 %		
Cond. paiement:	5 à 30 jours, 40 nos	Déclarations dans les 15 jours	

REF	REFERENCE	DENOMINATION	ABRÉV.	UNITE	QUANTITE	PRIX	%	IMPORTEMENT	CHF
20	06005.97002	MOUVEMENT MECHANIQUE		20	1 Pcs	538.00			5.30
	4239.238.02		12225						
	278.002								
	Valeur marchandise								3.30
	Montant minimal à facturer 50.-, différence								44.70
	TVA 7.50 % SUR CHF 50.00								3.75
	TOTAL								CHF 51.75

ETA S. A.
Fabriques d'Ébauches

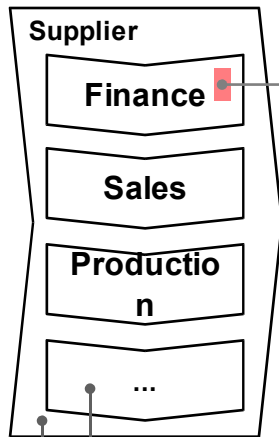
+ 5 mouvements cal. 955/14 Aiq. 1 sans secondes
A ajouter sur cette commande, afin de nous être
les so- de frais

Salutations

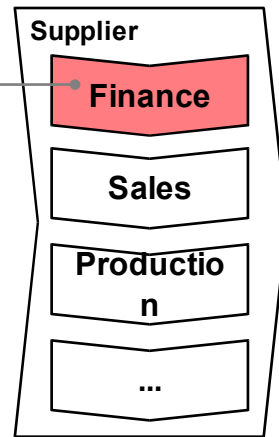
Chiodo

Integration won't stop here

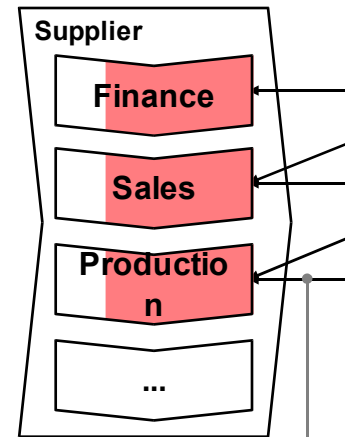
Phase 1
Computerization of individual functions (support of island functions such as invoicing)



Phase 2
Computerization of functional areas (integrated functional areas, such as financial accounting)



Phase 3
Design of integrated processes (internally from customer to customer, such as e.g. order processing)

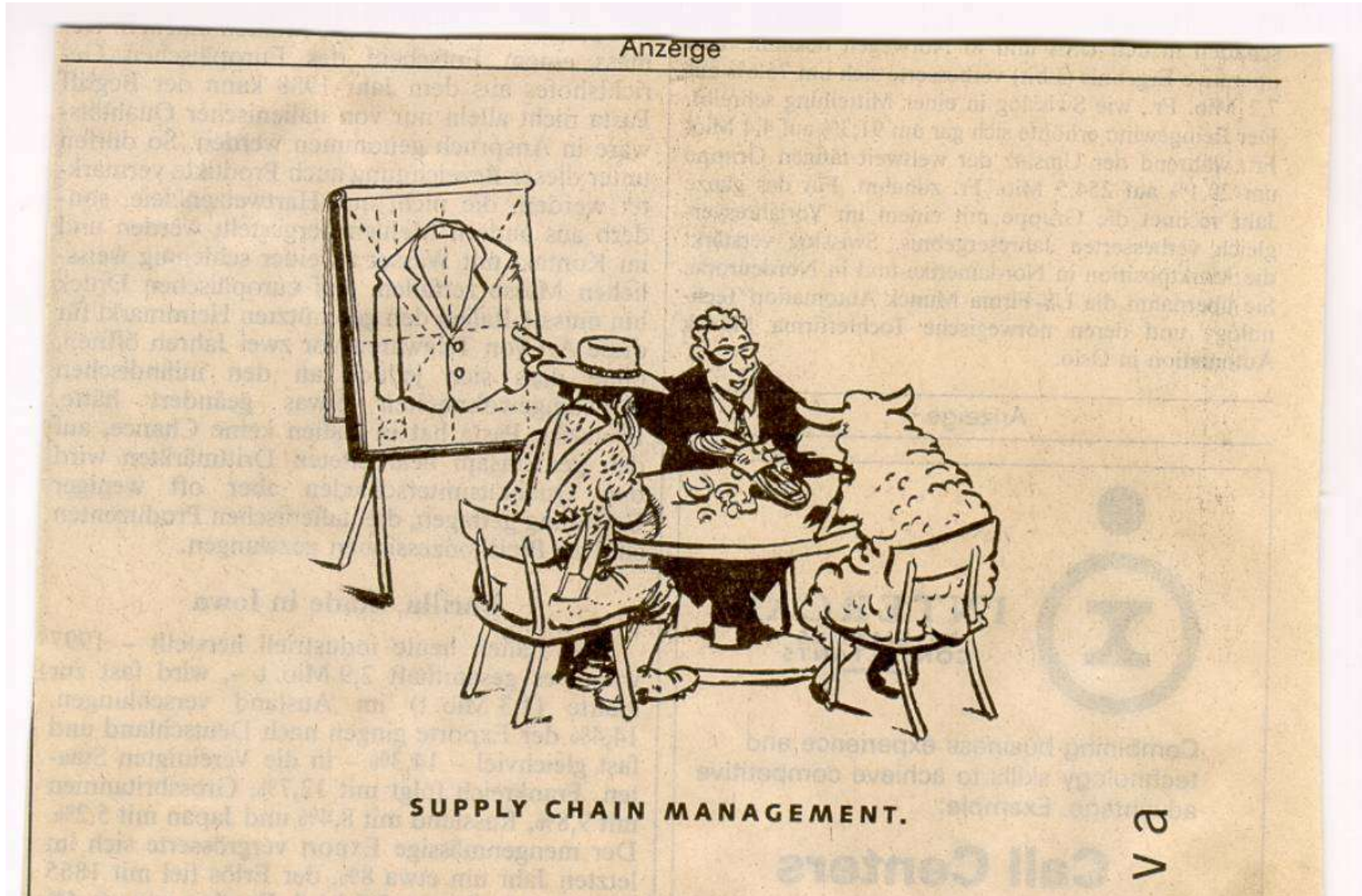


Integration via computerization

Function / process

Business unit / Enterprise

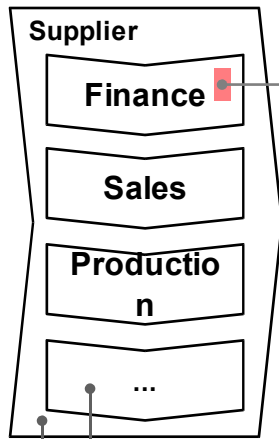
... cross company...



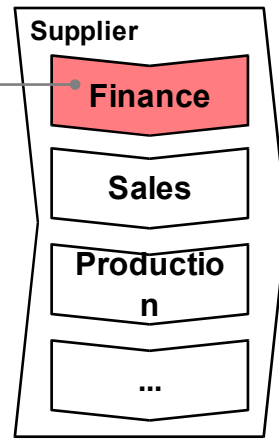
Quelle: NZZ

Integration won't stop here

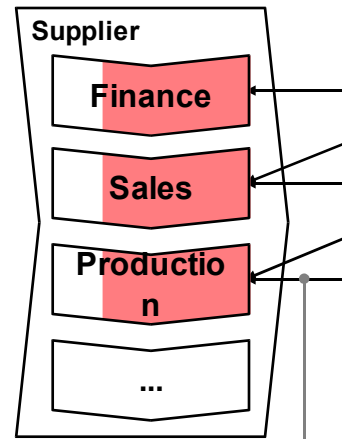
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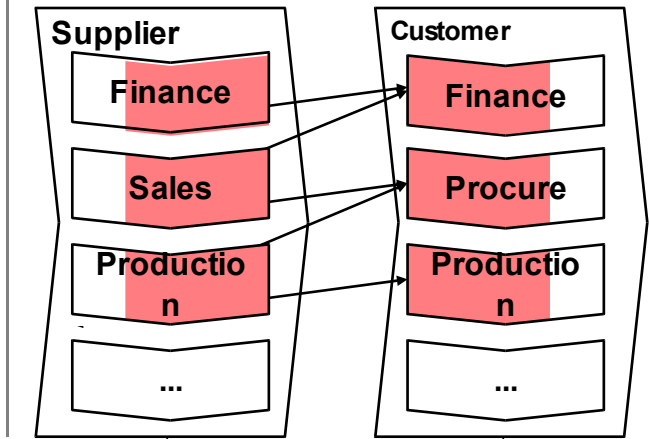
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 Design of integrated processes (internally from customer to customer, such as e.g. order processing)



Phase 4
 Individual 1 : 1 integration of cross-enterprise processes



Integration via computerization
 Function / process
 Business unit / Enterprise

Output
 Network infrastructure

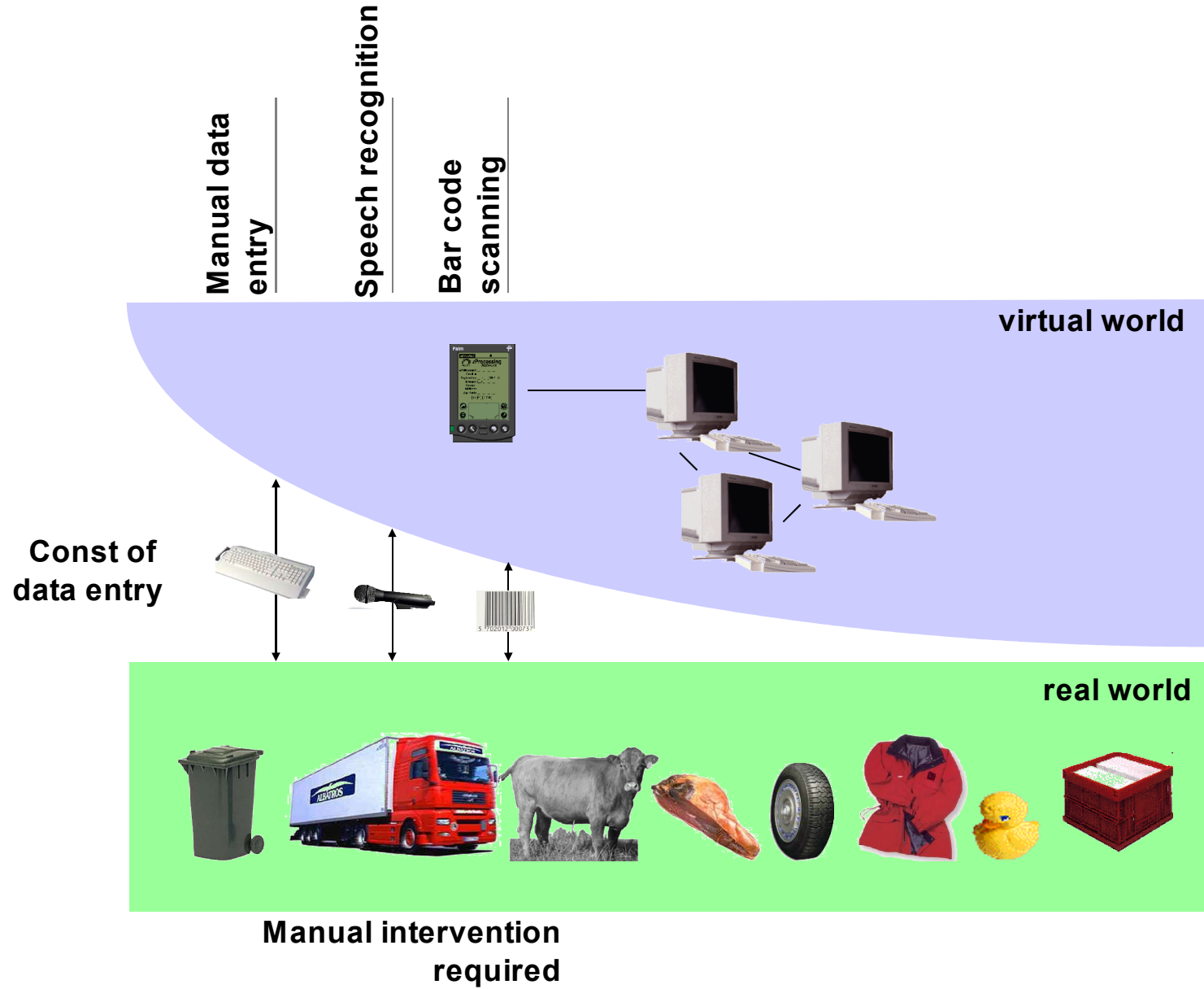
Phase 5
 Consistent m : n integration of cross-enterprise processes with the establishment of a networking infrastructure



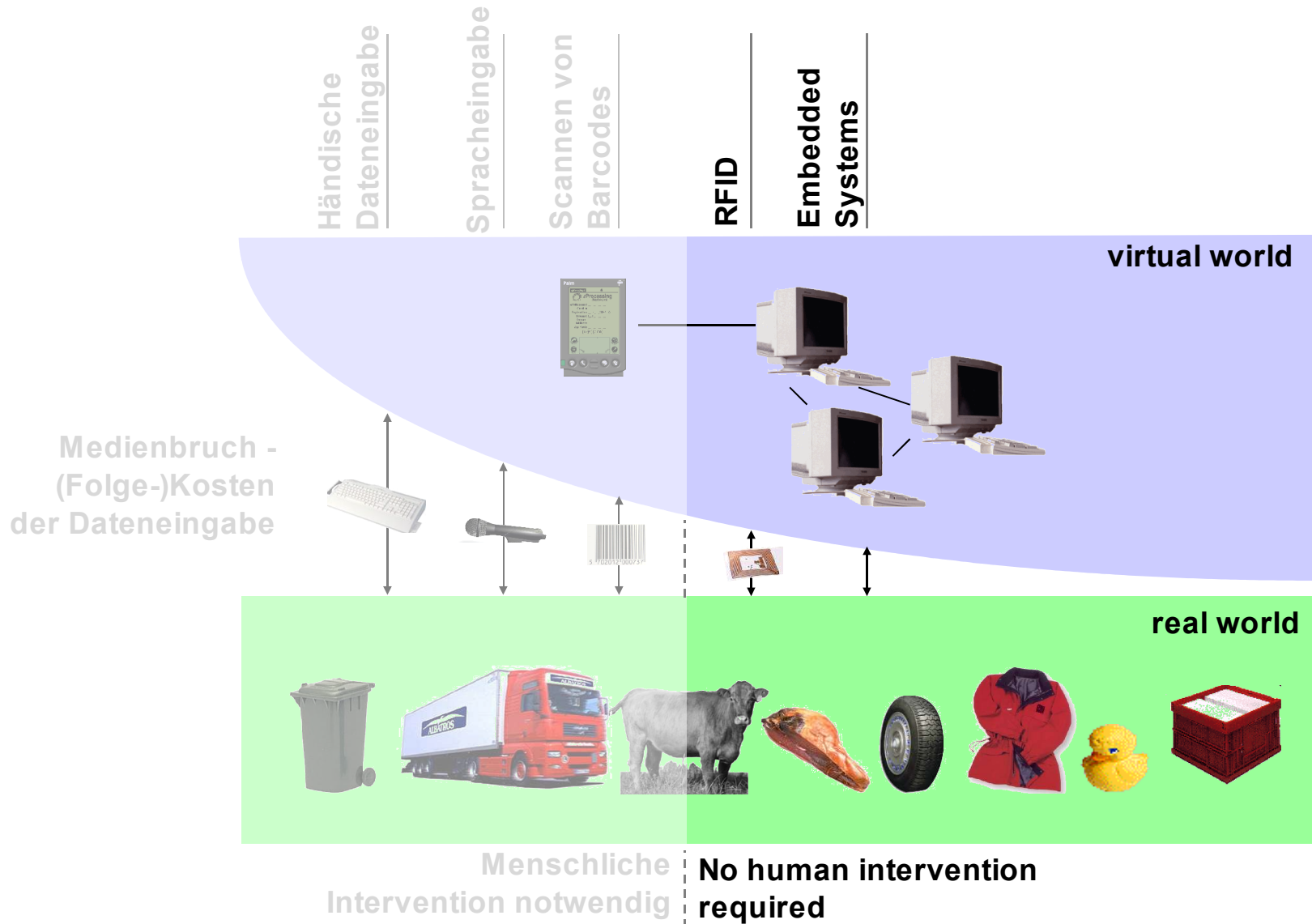
Because many business problems ask for ...

- **Shrinkage:**
 - Shrinkage (due to internal and external theft, administrative errors and vendor fraud) cost US retailer 33 billion USD (1.8% of sales) in 2001.¹
- **Out-of-stock:**
 - Out-of-stock in the grocery industry runs at 5-10% which leads to lost sales of 3-4% for retailers.³
 - On average, 15% of advertised items are out-of-stock.⁴
- **Counterfeiting:**
 - Product counterfeiting is estimated to account for between 5 and 7% of world trade, with a value of 280 billion USD.¹
- **Recall:**
 - In the automotive industry in Germany, there were 113 official recalls in 2001.²
 - In 2000, Firestone had to recall 14.4 million tires of which 6.5 million were still in use.³
- **Recycling:**
 - In the future, car manufacturers in the EU will be required to take back old cars. By 2005, 85% of the weight of a new car have to be recycled.⁴
- **Data capture:**
 - GM estimates that there 1724 barcode spec, which is mandatory for suppliers since 2001, saves 100 million USD per year in shipping, mishandling and other expenses.⁵
- **Unsaleables:**
 - The cost of unsaleables for warehouse-delivered food and grocery products are estimated at 1 billion USD in 2001 in the US.²
- **Data accuracy:**
 - In a case study with a retailer, the difference between physical inventory and inventory record was on average 35% of target inventory.⁵

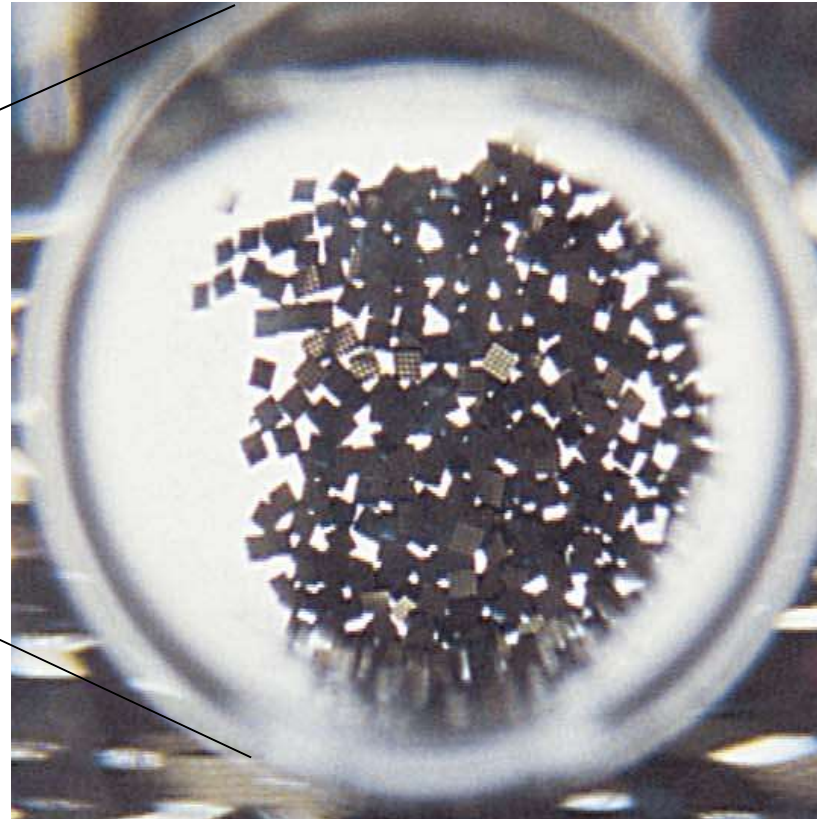
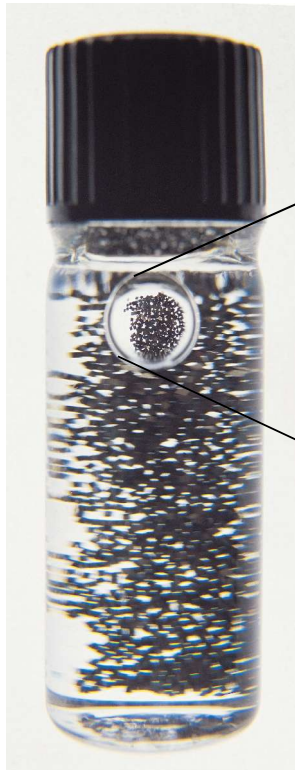
...the seamless integration of the real with the virtual world



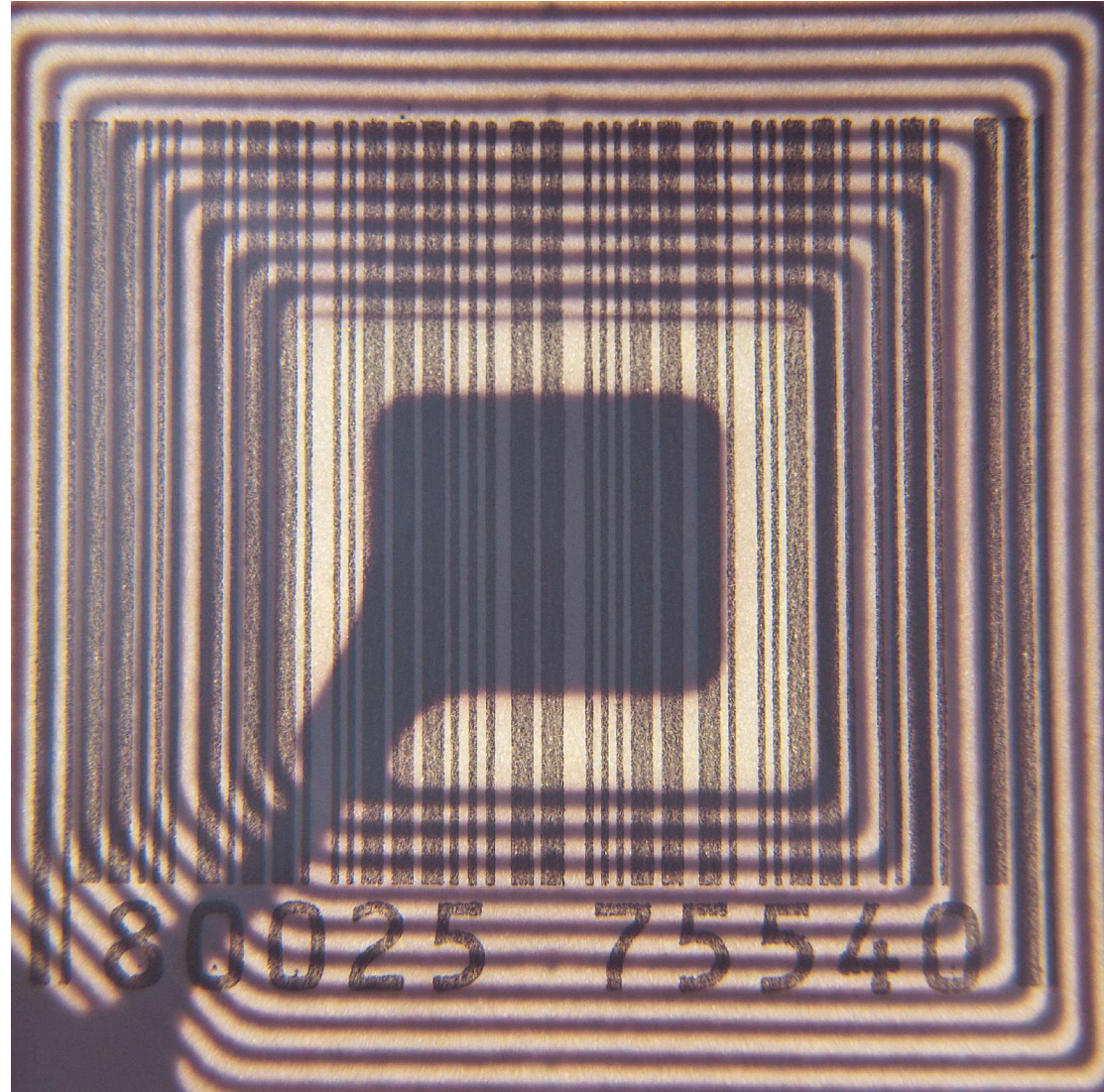
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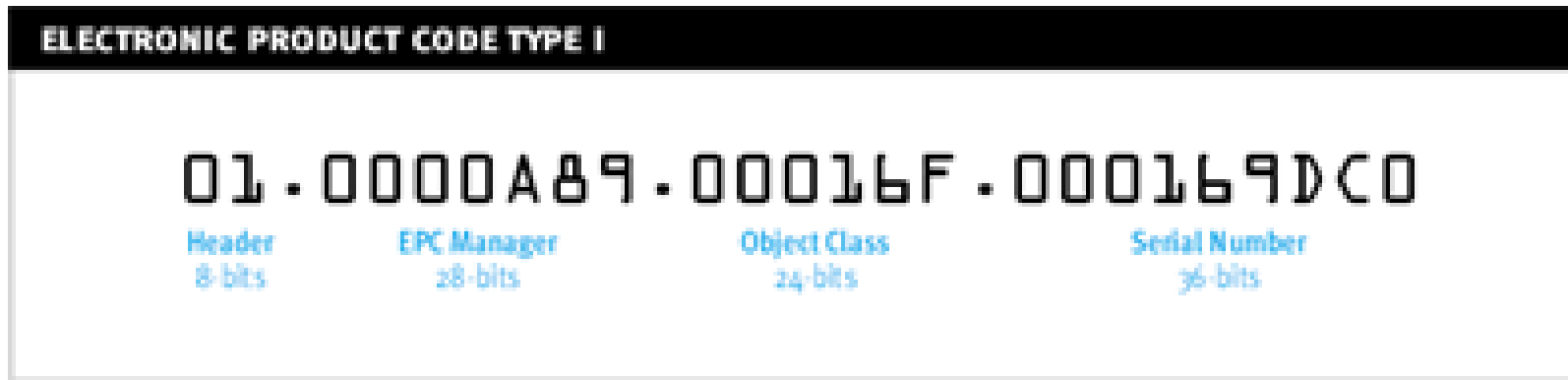
Therefore we develop low cost minicomputers ...



... with mobile communication capabilities ...

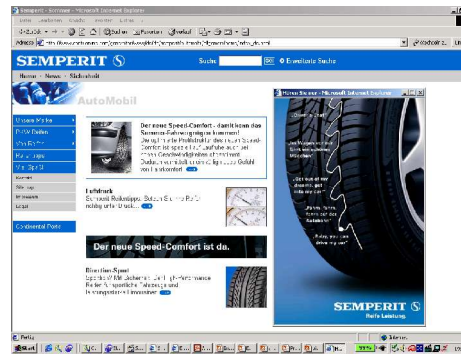


... which can store an identity number called Electronic Product Code ...



... and link every product to its homepage ...

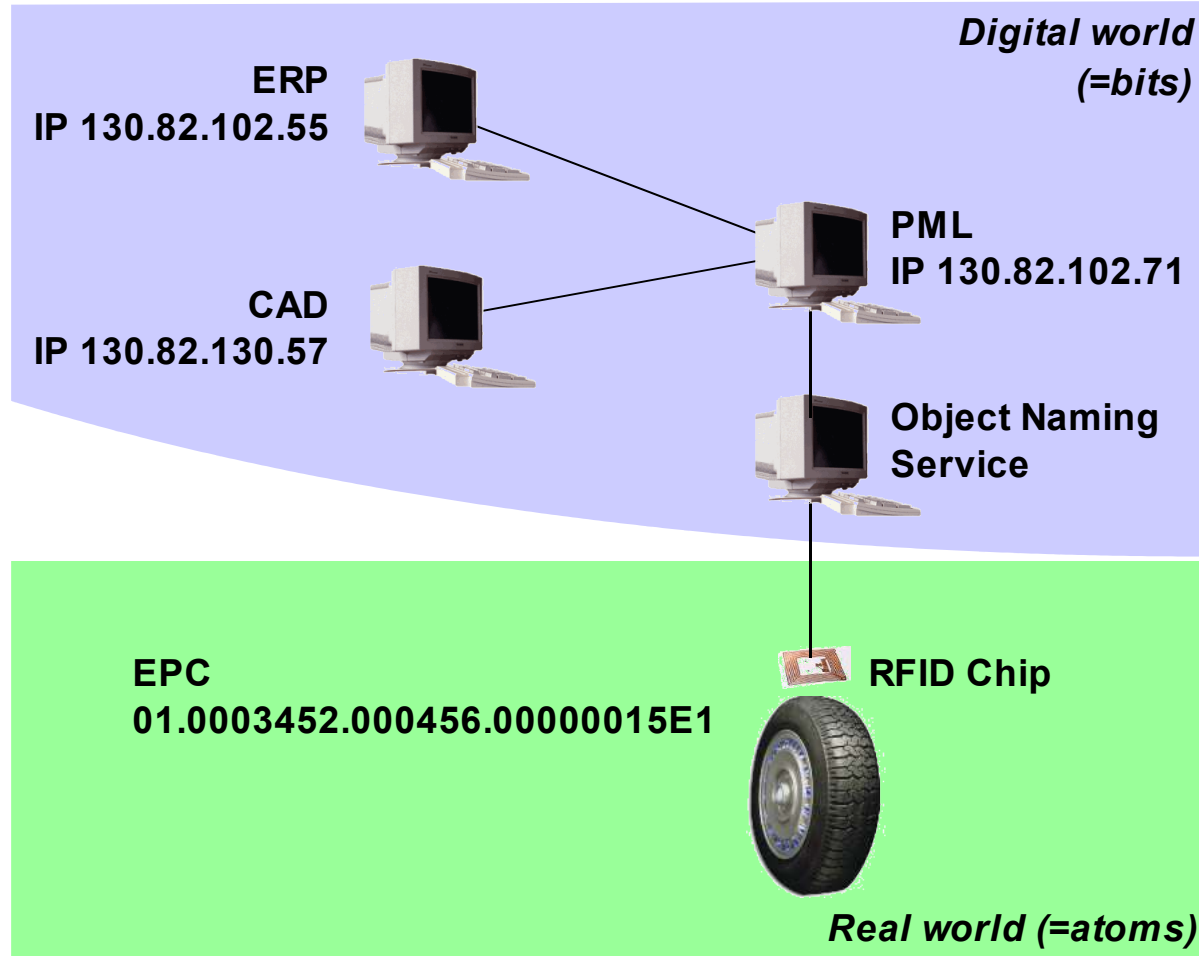
Digital world



Real world



... based on the emerging Auto-ID / EPC Infrastructure



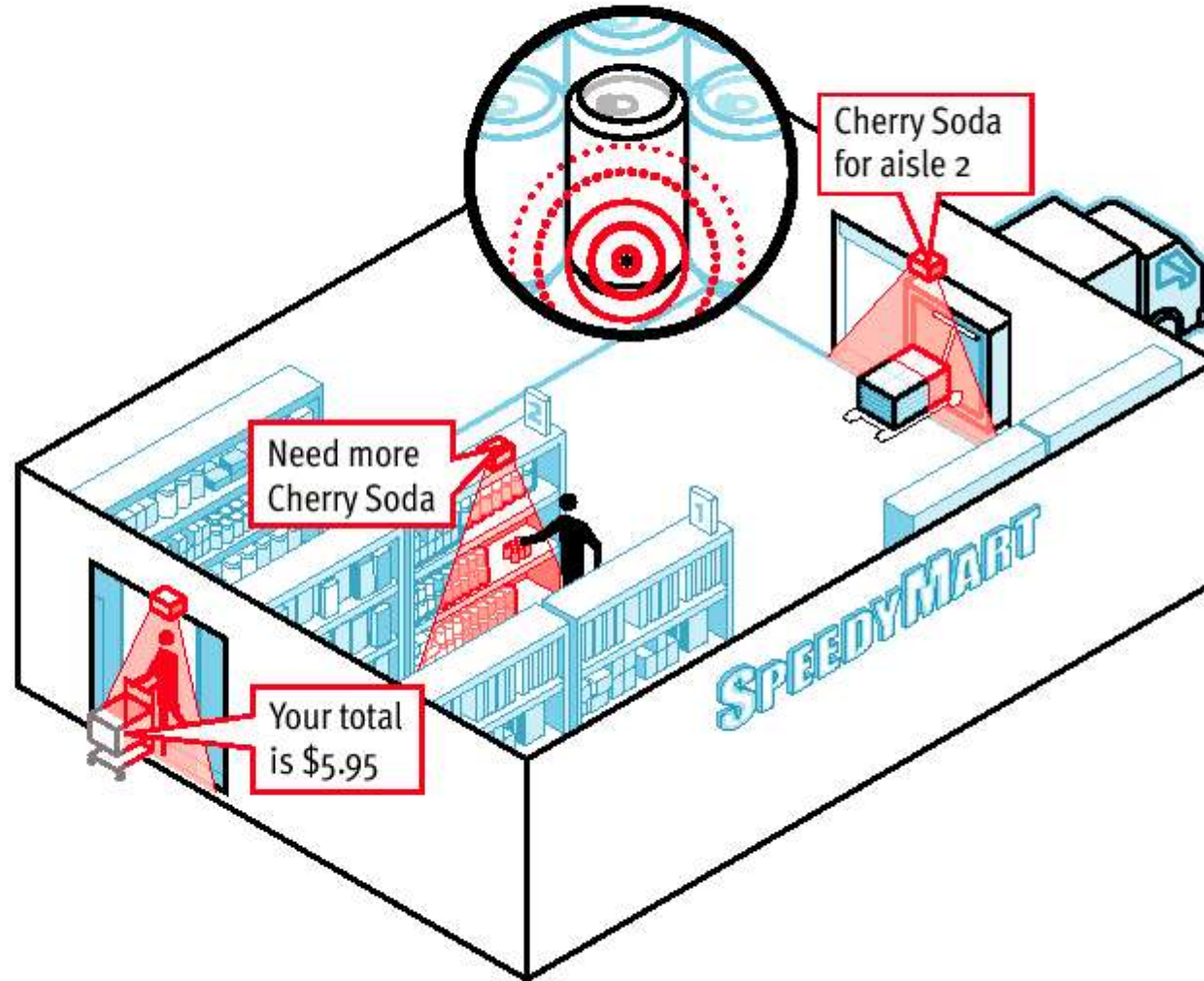
We start at pallet level and drive towards item tagging



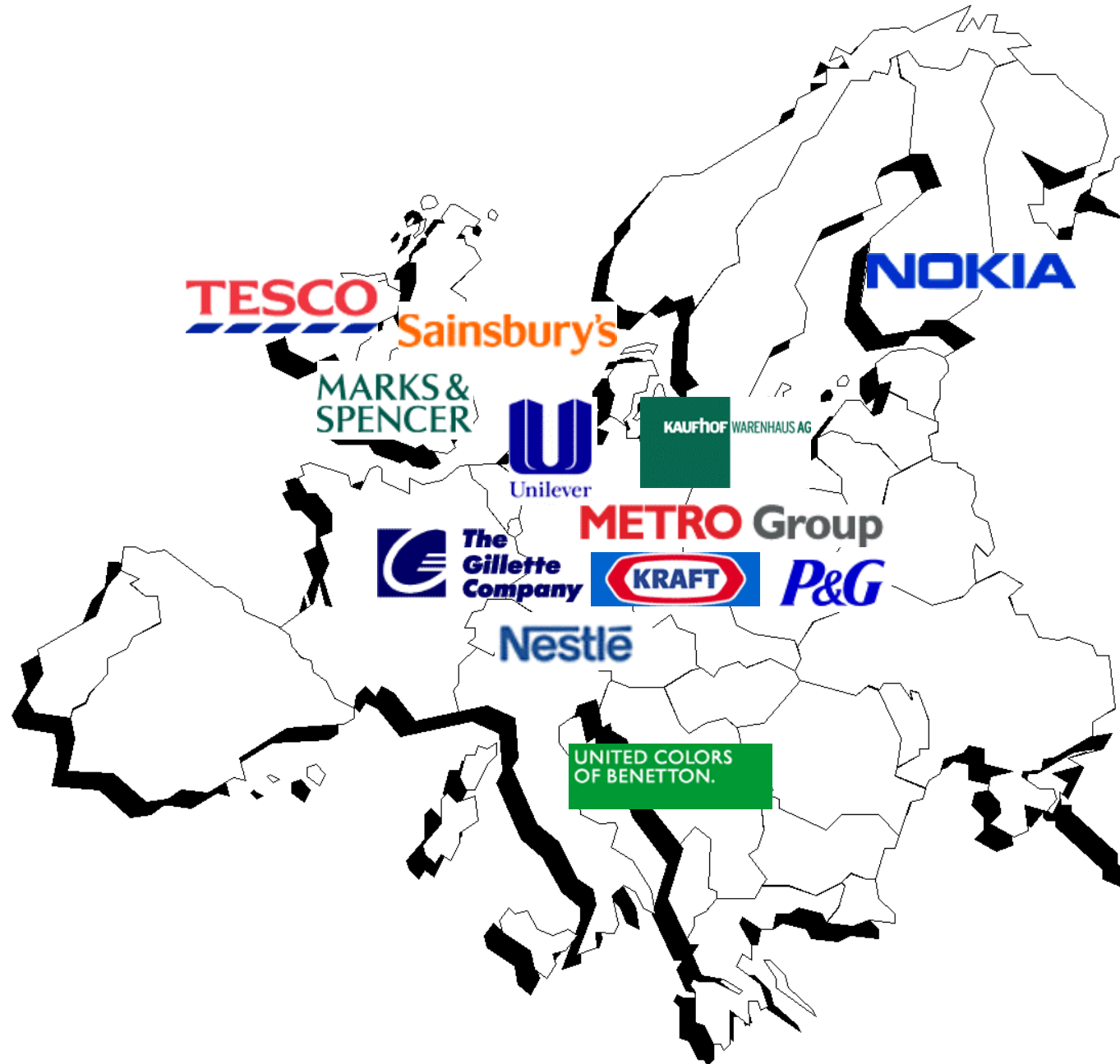
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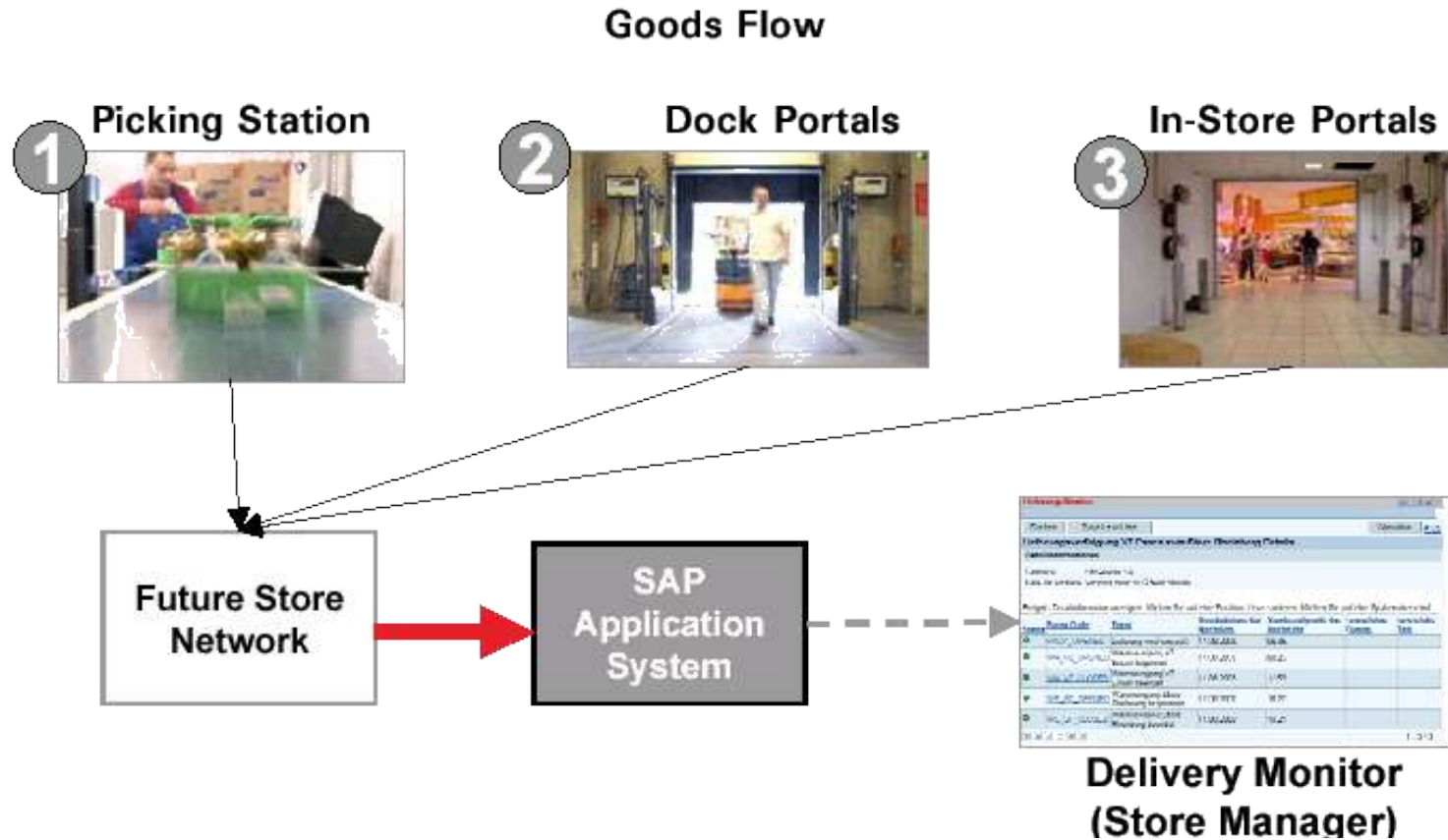
Applications and standards emerge ...



... all over Europe



The Metro Group Future Store uses RFID tags on pallets and cases



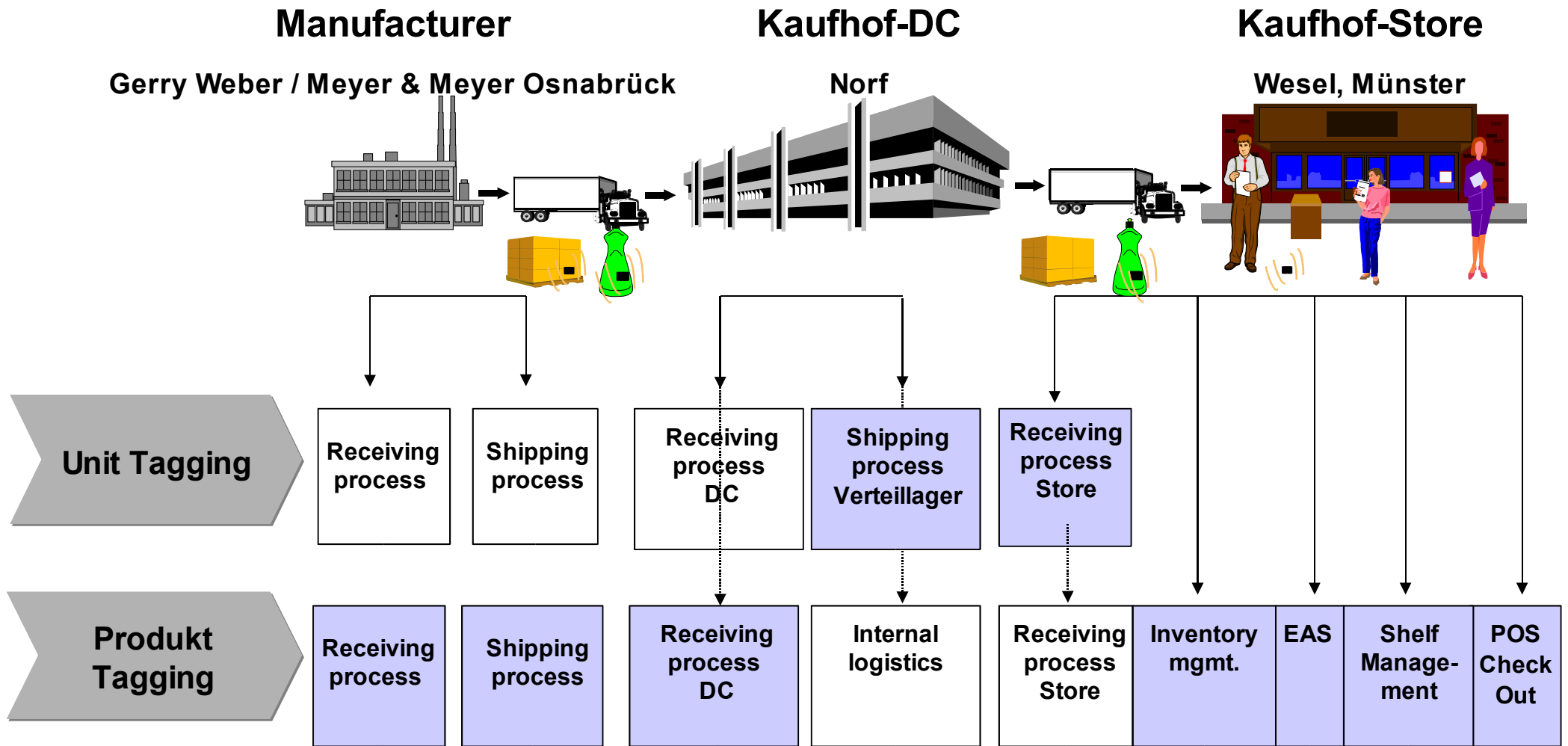
Source: Dr. Gerd Wolfram, "Metro Group Future Store Initiative: RFID in the Supply Chain", Presentation EPC Symposium, Chicago, September 15-17, 2003

Gerry Weber is tagging garments...



Source: Uwe Quiede, "METRO Group Future Store Initiative: Projekt Kaufhof - Gerry Weber",
Presentation, January 9, 2004

... and improves several processes considerably

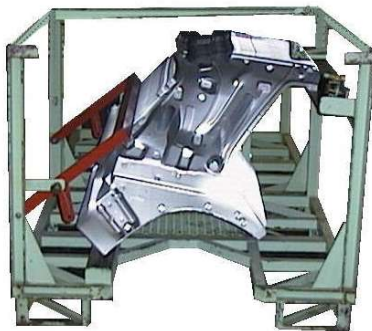


Source: Uwe Quiede, "METRO Group Future Store Initiative: Projekt Kaufhof - Gerry Weber", Presentation, January 9, 2004

Automotiv: Special bin tracking at Volkswagen



- Problems
 - Shrinkage of special bins: ca. EUR 15,000,000 p.a.
 - Machine down time, extra tours, manual counting: ca. EUR 10,000,000 p.a.
- Benefits of RFID based solution
 - Avoid manual counting and searching
 - Identify shrinkages and reduce number of special bins
 - Improve process reliability: availability of special bins

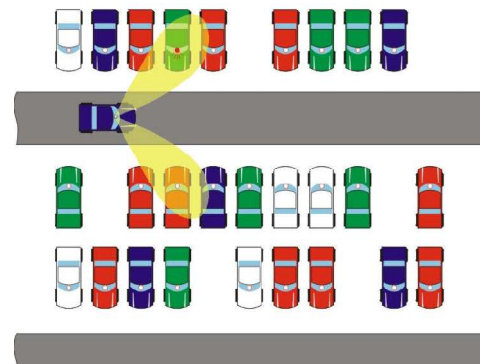


Source: Identec Solutions, W. Gantner

Automotiv: Tracking of cars in the distribution process



- Implementation
 - 12.000 cars are temporarily tagged
 - 50 fixed readers monitoring the process
 - 100 handheld readers
- Customer Value
 - Improved process throughput - faster localisation (4x)
 - Improved process quality - car follows the process
 - Improved process control - online status of every car



Source: Identec Solutions, W. Gantner

High tech: Flexible manufacturing enabled by RFID-based production control in chip factories

- Lot-track Solution
 - Active tag including distance measuring
 - Localization and control software
- Customer Value
 - Complete stock and transport transparency
 - Real time inventory
 - Reduced cycle times, reduced capital lockup
 - Platform for future production automation



Source **intellion**

Aviation: Management of ground equipment

- Implementation
 - 2.500 luggage trolleys are tagged
 - 3 mobile readers in maintenance area
 - Fixed readers in different sectors
- Customer value
 - Optimised use of trolleys
 - Increased availability of trolleys
 - Actual status of each trolley
 - Less initial and annual investment



Source: Identec Solutions, W. Gantner

Logistics: Tracking and tracing of trucks and trailers

- Implementation
 - 15.000 vehicles and trailers are tagged
 - 36 fixed readers at logistic centres
 - 36 mobile readers for on-site staff
- Customer Value
 - Automated access control
 - Online status of vehicles and trailers
 - Better usage of vehicles and trailers



Source: Identec Solutions, W. Gantner

Logistics: Pay-as-you-destroy



Aviation: Maintenance and repair



Surgery: Management of surgery tools



Used-based payment systems: Save-as-you-dance

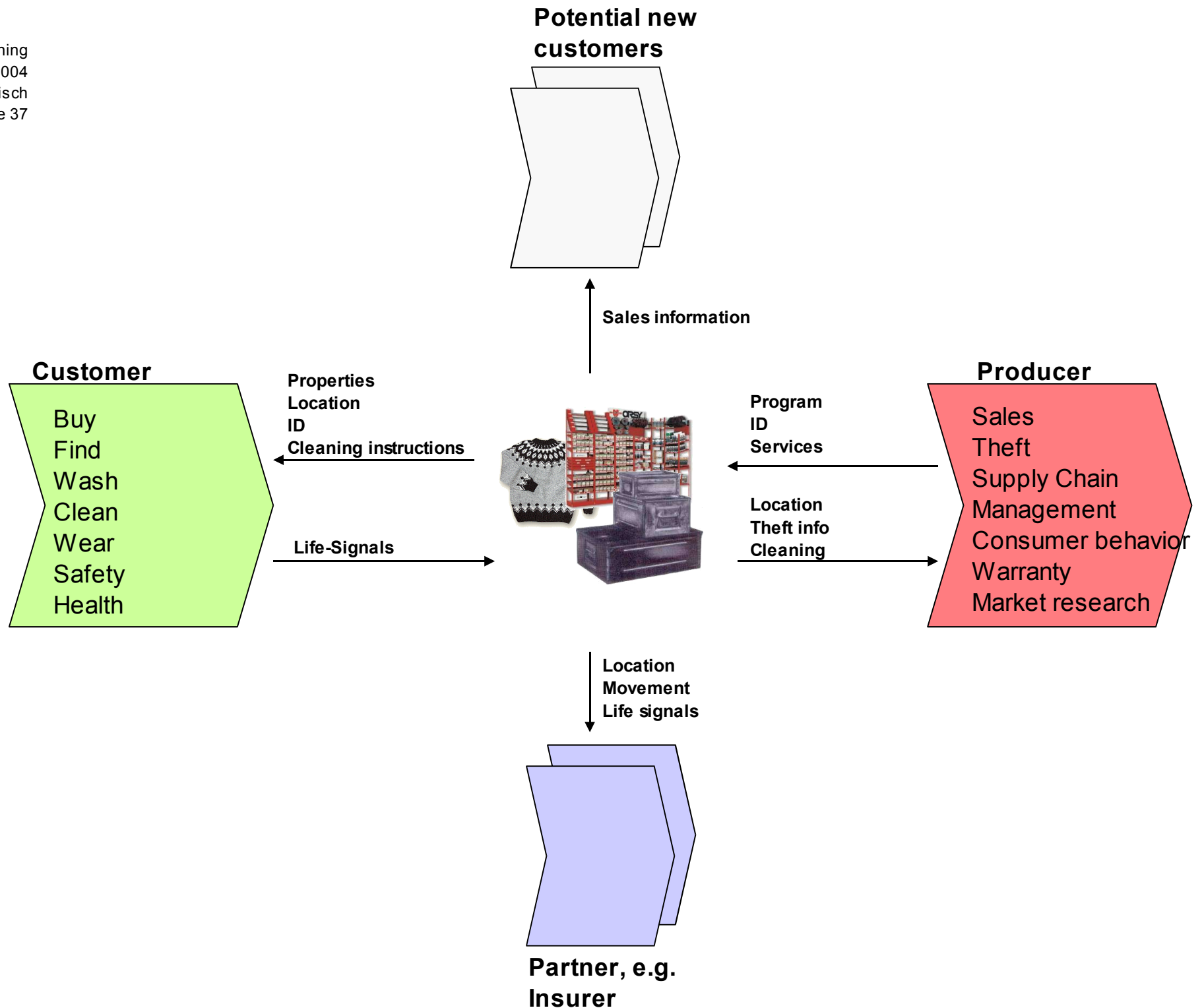


Agenda

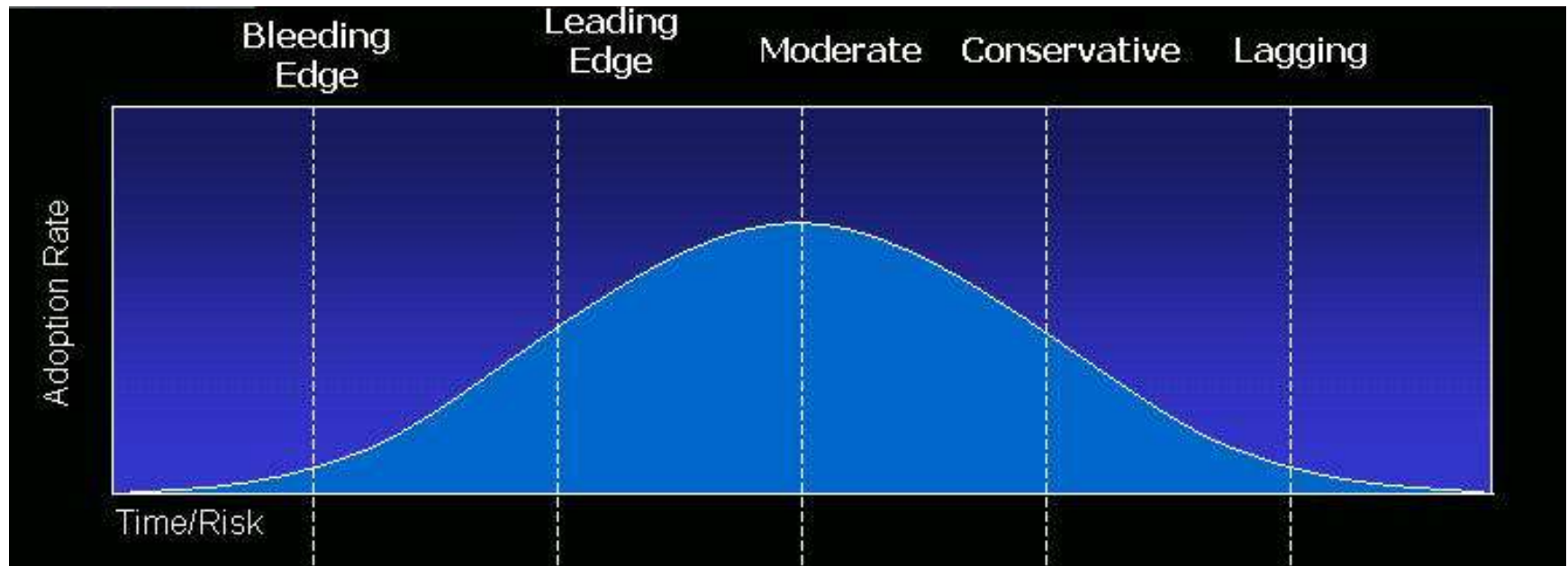
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Good products want to communicate!

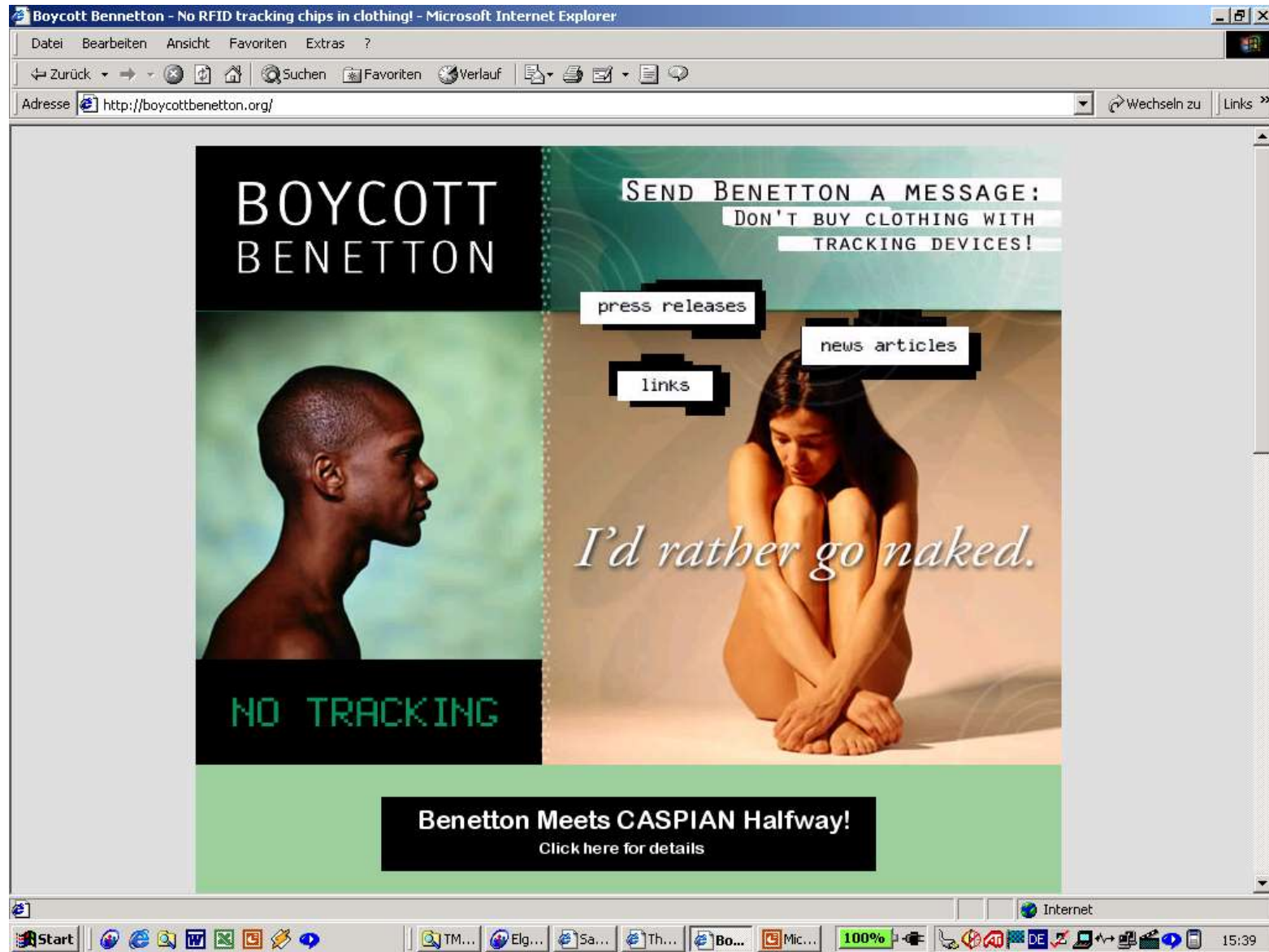
- Combine esthetic with functional communication
- Function richness will grow
- Your product becomes your agent
- Smart things evoke emotions
- Smart things are starting point to services
- The market is where products are used
- Product, process and service design merge



Where are we?



Privacy



Summary

- RFID is not new
- RFID standards are currently being established
- RFID is an infrastructure technology, not an island technology

- Companies will use RFID to enhance their competitive advantage
- RFID systems implementation must start with a business problem
- RFID must become part of an enterprise`s software infrastructure
- RFID still is no plug & play technology
- RFID systems implementation requires technical skills

- Pay attention to privacy issues
- Don't install complexity: grow by chunking

Progress has no alternative



EPCglobal 



The Next Step towards Mobile and Ubiquitous Computing

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