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New Media and innovative E-Business in the Supermarket

Contradiction, Waste of Capital, or Strategic Business Driver?

Tuesday, February 22, 2005, 19h

New Media and innovative E-Business in the Supermarket: Contradiction, Waste of Capital, or Strategic Business Driver?

Prof. Claudia Loebbecke, Department of Media Management, University of Cologne
[President-Elect, Association of Information Systems \(AIS\)](#)



Claudia Loebbecke is Director of the Department of Media Management at the University of Cologne. As of July 2005 she will be President of the global 'Association of Information Systems (AIS)'. Previously, she held the KRAK Chair of Electronic Commerce - the first of its kind in Europe - at the Copenhagen Business School. She also worked at Erasmus University, McKinsey & Co. (Germany), INSEAD, Sloan School, Hong Kong University of Science and Technology (HKUST) and the University of New South Wales (Sydney). She is Regional Editor of the Journal of Strategic Information Systems (JSIS) and is on the editorial board of the Journal of the AIS (JAIS), the Journal of Information Technology (JIT), the Journal of Media Management (JMM). Claudia Loebbecke received a Masters (1990) and a Ph.D. (1995) in Business Administration, both from the University of

When? 22 February 2005 19:00

Duration: 02:00:00

This lecture is already over.

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Lecture Pictures



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New Media and Innovative E-Business in the Supermarket: Waste of Capital or Strategic Business Driver?

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Agenda

- New Media and Technologies in the Supermarket
- The Case of Metro Group's Future Store
- Content Integration in the Supermarket
 - Technologies
 - Assessment
- RFID
 - Overview
 - RFID on Items
 - RFID on Pallets and Cases
 - Assessment
- Challenges, Implications, and Outlook

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New Media and Technologies in the Supermarket

Content Integration

- Content Provision Devices
- Content Provision Infrastructure
 - Content Bus
 - RFID on Items

Supply Chain Integration

RFID
on Pallets and Cases

↔

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Metro Group Holding 2003

- Fourth largest retailer worldwide (Walmart No. 1)
- Sales: US \$ 64 billion in 2003 (Walmart US \$ 272 billion)
 - 51% in food (Walmart 44%)
 - 47% domestic (Walmart 79%)
- Food Retailing (21%), Cash & Carry (47%), Department Stores (7%), Speciality Stores (25%)
- Staff: About 240,000 employees
- Business premises: 2,370 in 28 countries
- Organizer of Future Store Initiative (FSI)

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Metro Group Holding 2003

Metro Group Holding 2003				
Cash & Carry <i>Metro/makro</i> Turnover: USD bn 25.1 Countries: 26 Outlets: 475	Food Retailing <i>real,- extra</i> Turnover: USD bn 11.0 Countries: 3 Outlets: 755	Specialty Stores <i>MediaMarkt Saturn Praktiker</i> Turnover: USD bn 13.4 Countries: 14 Outlets: 775	Department Stores <i>Galeria Kaufhof</i> Turnover: USD bn 3.9 Countries: 2 Outlets: 148	
European Procurement (MGB)	International Clearing (MIAG)	Logistics (MGL/MDL)	IT (MGI)	Real Estate (MRE)

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Metro Group's Future Store Initiative (FSI)

Premier integrated real-world roll-out of existing & new IT in brick-and-mortar supermarket aiming at consumer convenience

- Technical ambitions
 - Integration of front end, application layer, and back end
 - Integration of structured and unstructured data from internal and external data sources
 - Availability of almost all info sources for customers
- Timeline
 - Spring '02: Informal project start with small internal team
 - July '02: Founding FSI
 - August '02: Kick-Off Meeting
 - April '03: Future Store opening

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Partners in Future Store Initiative

Intel, Cisco Systems, Fujitsu Siemens, Hewlett Packard, Philips, DHL, Boston Consulting Group, IBM, SAP, Oracle, Pironet, Microsoft, Kraft Foods, Coca Cola, Gillette, Nestlé, Henkel, Johnson & Johnson, Procter & Gamble

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Content Provision Devices

... for faster & easier shopping

... for new form of customer communication

Personal Shopping Assistants (PSAs) & Customer Cards, Intelligent Scales, Checkout via PSA & Self-Checkout, Info Terminals, Electronic Advertising Displays, Electronic Price Labeling

PDAs for FS employees

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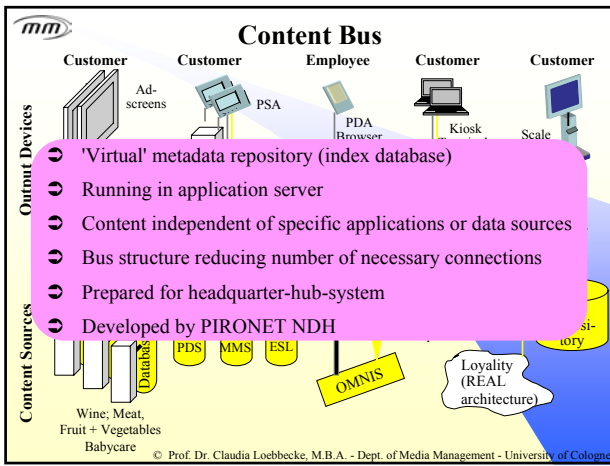
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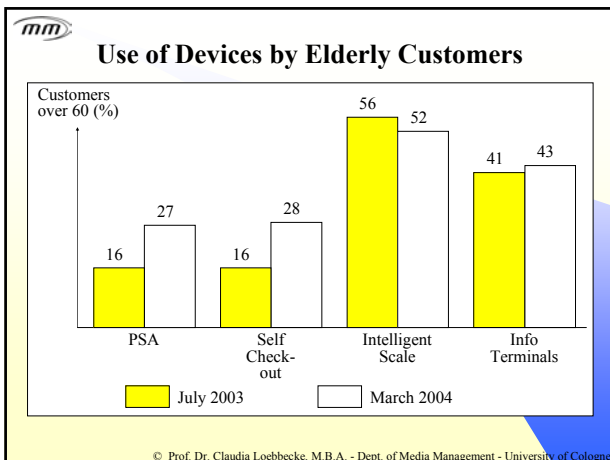
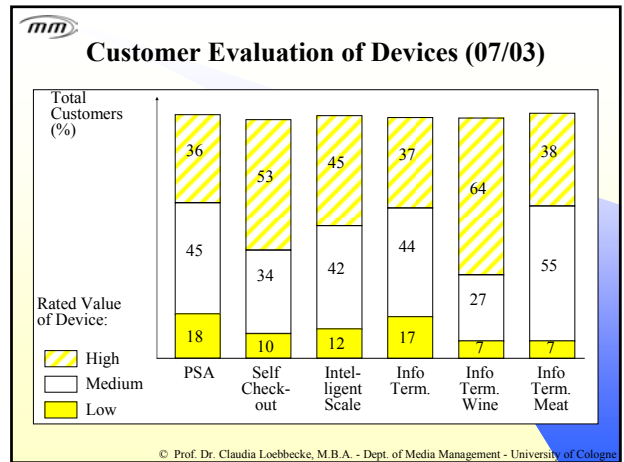
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Content Integration in the Supermarket: Measurable Results

- Increased Customer Satisfaction -

Individuality, Reliability, Convenience

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Radio Frequency Identification (RFID)

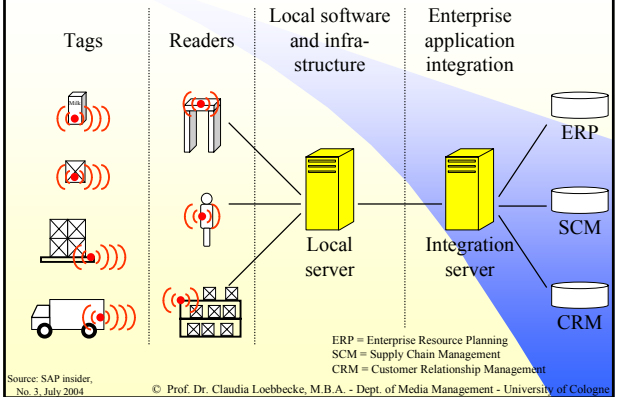
- Reading and saving data, contact-free, and with no line-of-sight needed between transmitter and receiver
- Data saved on RFID transponders (tags) and read via electromagnetic waves (radio frequency field)



Radio Frequency Identification (RFID)

- Reading and saving data, contact-free, and with no line-of-sight needed between transmitter and receiver
- Data saved on RFID transponders (tags) and read via electromagnetic waves (radio frequency field)
- 'Complete infrastructure' enabling wireless reading of information from RFID tag as well as integration into enterprise systems

RFID Infrastructure



Radio Frequency Identification (RFID)

- Reading and saving data, contact-free, and with no line-of-sight needed between transmitter and receiver
- Data saved on RFID transponders (tags) and read via electromagnetic waves (radio frequency field)
- 'Complete infrastructure' enabling wireless reading of information from RFID tag as well as integration into enterprise systems
- Limitation: Regulatory boundaries regarding radio frequency communication spectrum

Radio Frequency Bands

Frequency	Benefits	Drawbacks	Applications
High 13.56 MHz	<ul style="list-style-type: none"> - Accepted worldwide - Works in most environments - Widely used today 	<ul style="list-style-type: none"> - <1.5m read range - Not working near metal 	<ul style="list-style-type: none"> - Item level track - Airline baggage - Building access
Ultra high 300 - 1200 MHz	<ul style="list-style-type: none"> - Longer read range potential (>1.5 m) - Growing commercial use 	<ul style="list-style-type: none"> - Not readily usable in Japan - Not working in moist environment - Detuning when tags in close physical proximity 	<ul style="list-style-type: none"> - Case, pallet and container tracking - Truck and trailer tracking

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RFID Tags

Passive Tags

- Radio wave powered
- Only reading possible
- Used for Globally Unique Identifier (GUID)
- Low data capacity
- Low range
- High durability
- Low production costs



Active Tags

- Battery powered
- Reading and writing possible
- Need of activation signal
- High data capacity
- High range
- Low durability
- High production costs

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Passive Tag, 13.56 Mhz, < 1.5 meter range

Printers for RFID-Transponders



Printing NVE Label with integrated RFID Transponder
PLUS writing on RFID Chip

RFID Tags on Items in the Future Store

Test Product in Future Store

- 'Philadelphia' cream cheese (Kraft Food)
- 'Pantene' shampoo (Procter & Gamble)
- 'Mach 3 Turbo' razor blades (Gillette)
- CDs, DVDs, VHS (various manufacturers / labels)

Focus

- ➔ Expiration dates and out-of-stock issues
- ➔ Innovative marketing concepts
- ➔ Anti-theft protection
- ➔ Youth protection etc, theft prevention (similar to Electronic Article Surveillance - EAS)

Item-Level RFID on Consumer Premises

Potential end-consumer applications (no roll-out yet)

Intelligent fridge

Intelligent washing machine

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RFID Tags on Pallets and Cases

Value chain from manufacturer to point of sale

Product transport

⇒ Products can be located along entire transport chain

Warehouse dispatch

⇒ Products get status 'on route to destination'

Processes in store

Delivery to Store

⇒ Control if arriving products match order

Warehouse management

⇒ Goods flow system exactly registers every product

Transport into sales room

⇒ Products get status 'transported into store'

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RFID Tags on Pallets and Cases: Measurable Results

Optimized Work Processes

Speed, Transparency, Effectiveness

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RFID Tags on Pallets and Cases: Measurable Results

Speed

- Accurately monitored warehouse inventories
- Fast passed replenishment orders
- Improved availability of goods in store

-9% to 14% out-of-stocks

Transparency

- Localization of goods
- Transparent warehouse and shop inventories
- Improved sales controlling

Effectiveness

- Accurate control of quantities ordered
- Exactly matching production planning
- New types of customer services
- Improved theft protection
- Less storage space

-11% warehousing & handling costs

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RFID Tags on Pallets and Cases: - Financial Impact - Example Calculation -

Supervising time saved per truck
⇒ 10 minutes

Number of trucks per day
⇒ 15

Number of working days per year
⇒ 250

Cost per working hour
⇒ EUR 25

Supervising time saved per year
⇒ 625 hours

Cost reduction per year
⇒ EUR 16,000

Number of pallets shipped per year
⇒ 80,000

Reduction in cost per pallet shipped
⇒ EUR 0.20

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RFID in Retailing: Industry Potential

- ⇒ Improved demand forecasting (10-30%)
- ⇒ Reduced inventory levels (10-30%)
- ⇒ Lowered running inventory costs (5%)
- ⇒ Lowered warehouse labor costs (8%)
- ⇒ Increased sales (2%)

Standards Necessary !

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Management Challenges & Implications

More item-level RFID
(e.g., privacy complaints)

Centralizing originally
separate applications
and processes
development

External content availability
for electronic ad displays

Presenting most information
on front-end devices for customers

From Pilot to Roll-Out

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Future RFID Issues

- Technical
 - Transmission problems depending on product material
 - Metal or liquids often causing failures
- Data management
 - Information creation reaching new order of magnitude with individual products being tracked through complete product life-cycle
 - Revolutionized data management required
- Privacy issues
 - Consumer perception level
 - Legal level

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**EU RFID Privacy Legislation
- Requirements as of Dec. 2004 -**

Retailers must disclose

- Presence of RFID tags on products and presence of readers,
- How they intend to gather and control the information,
- For which purposes information will be used,
- Who will control data,
- How to discard tag from the product,
- How to exercise the right to access the information on the tag,
- ...

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**EU RFID Privacy Legislation
- First Working Group Document 105 (Jan. 2005) -**

- Outlining RFID's potential in variety of business sectors, incl. health care, retail, pharmaceutical, and logistics;
- Calling attention to need for companies to comply with principals in EU privacy directives whenever personal data is collected using RFID;
- Guiding makers of RFID tags, readers, applications, as well as standards bodies on their responsibility to develop privacy-compliant technology;
- Requiring consumers possibility to delete personal information from tags if tags affixed permanently.

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Beyond the Supermarket: RFID Application Opportunities

- Logistics
- Tickets (public transport, concerts...)
- Electronic money
- Banknotes (security)
- Animal identification
- Libraries
- ...

Technologies will come
(RFID faster than content integration)

Learn about and prepare your business;
make sure it will also be YOUR strategic business driver !

.... Questions, Comments, Complaints ?

Beyond this Talk:

Association of Information Systems

➔ www.aisnet.org

Thank you very much for your attention !

✉ claudia.loebbecke@uni-koeln.de