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Business Information Systems Unit 4 Input and Output Devices: RFID

Prof. Dr. Martin Hepp

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Trade-off: Specialization Gains vs. Cost of Coordination

- Further increase in specialization is limited by level of transaction costs (cost of coordination)
- Thus, technology and methodologies for reducing transaction costs are of utmost importance for future economic development.

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Impact of ICT on Market Structures and Organizations

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Project Management

- Project schedule
- Project milestone
- Project deadline
- Critical path

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Use of Project Management Tools

FIGURE 12-11
Sample Gantt Chart
A Gantt chart shows progress through systems development activities by putting a bar through appropriate cells.

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Critical Path Method (CPM)

```

graph LR
    A[Start Dishwasher] --> B[Dishwasher runs]
    A --> C[Have Shower]
    B --> D[Drive to Work]
    C --> E[Make Coffee]
    E --> D
  
```

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Business Information Systems

Unit 4

Input and Output Devices: RFID

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Logistics

- **Lecture**
 - Wednesdays, 10:15-12:00, HS 11
- **Exam**
 - Jan 30, 10:00 - 12:00 (120 minutes)
 - Classroom: HS 11
 - Registration Deadline: Jan 7, 2008
- **No classes on Nov 21 and December 5!** Instead, all future lectures will be 15 minutes longer, i.e. from 10:15 - 12:00.

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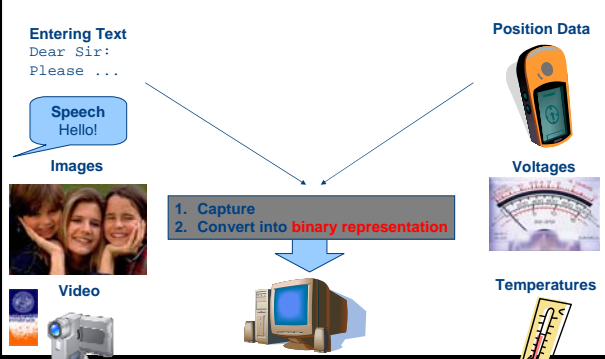
Auto-ID Technology

- Set of techniques for storing and retrieving small amounts of data in a highly automated manner
- Examples:
 - Barcodes on Products
 - RFID chips in sea containers
- Main Approaches
 - Barcodes 2D/3D
 - RFID / Transponders
 - OCR

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Overview: Collecting Input



Entering Text
Dear Sir:
Please ...

Speech
Hello!

Images

Video

Position Data

Voltages

Temperatures

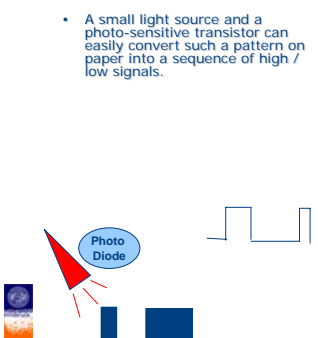

1. Capture
2. Convert into binary representation

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Barcodes and Barcode Readers

- A small light source and a photo-sensitive transistor can easily convert such a pattern on paper into a sequence of high / low signals.

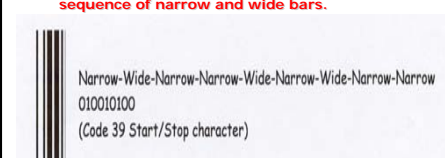




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Barcodes and Barcode Readers

- Rather simple but highly efficient technology for capturing data from paper and other surfaces
- A barcode contains digits or characters. Each binary number is encoded as a **sequence of narrow and wide bars**.

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Barcodes

Why can a barcode reader deal with varying reading speeds?
And why must one try to move the reader at a constant speed?

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Barcode Applications

- Barcodes mostly contain just the reference to more data in some database!

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2D/3D Barcodes

- More complex patterns for a higher data capacity

Input content

First Name: Todd
Last Name: Ogasawara
Job Title: Tech Geek
Company: MobileViews.com
Address: MobileTown USA
E-mail: editor@mobileviews.com

QR Code

Q: Wikipedia

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Optical Character Recognition

- Reconstructing the characters from text
 - Regular fonts
 - Specially designed OCR fonts

1234, T, Hepp

T = ?

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Data Collection from Paper Documents

- Corporations can include barcodes and checkboxes in paper documents, which can be used for processing the documents automatically.
- Example: Contract number

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RFID

- Very small, inexpensive devices that can send a short message to near receivers
- Self-powered or powered by induction

RFID Tag

„myID # is 123456“

RFID Receiver

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Power Supply by Induction (Passive)

- RFID Tag does not have a battery of its own, just a small capacitor that can hold a small charge.
- The RFID receiver used a coil to create an electromagnetic field.
- This field creates a small voltage in the RFID tags' coil, which charges the capacitor.
- After that, the RFID tag „wakes up“ and sends its message via radio transmission.

RFID Tag

„myID # is 123456“

RFID Receiver

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Self-Powered RFID Tag (Active)

- Has a power source of its own
- Advantages
 - Continuous operation (but not sending)
 - Larger range
 - Reusable
- Disadvantages:
 - Higher cost of production
 - Limited life-span

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Key Goal in Information Systems:

Company 1

Company 2

Company 3

Business Integration

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Eliminate Manual Data Entry

Automatic propagation of information along the value chain without any media break.

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Three Reasons and Their Ranks

- Consistency
- Timeliness
- Cost Reduction

Automatic propagation of information along the value chain without any media break.

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Media Break

Computer

Computer

Instead of

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Rebate Vouchers

UNITED STATES POSTAL SERVICE®

CHANGE YOUR ADDRESS ONLINE

SUCCESS!
Your change of address request was successful. A confirmation email has been sent to you.

Exclusive Savings for Movers
Click on each coupon to open and print. Coupons will open in a new browser window. Or select multiple coupons and click on the **Print Selected Coupons** button below.

- Bank of America \$50 Visa® Gift Card**
When you open a new MyAccess Checking™ account.
- LOWE'S 10% OFF**
Your next purchase up to \$2000.
- LINENS+THINGS 10% OFF**
Your entire purchase.
- Cherrie 15% OFF**
Catalog and online orders of \$50 or more.

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Entgelt

Absenddatum

Matrixcode

Markenzeichen

Seriennummer

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Train Tickets

- Again, the ticket just contains unique number
- But, for offline-processing, the ticket itself must include enough information for validating whether the ticket is valid (and for which connection and class)

Die Bahn OnlineTicket

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Where is the Price Information Stored?

RENE Center Buaß
46446 Emmerich

NEXTRARHEN GELB

2404105 001722

Gewicht:

23.09.03 1,082 kg
Preis/kg: Betrag:

1,59 €/kg 1,72 €

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What's that?

Automated Data Capture
+ Integration with other data

Better Business Decisions

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Thank you!

The slides will be available on the internet at
<http://www.heppnetz.de/teaching/bis/>

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