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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

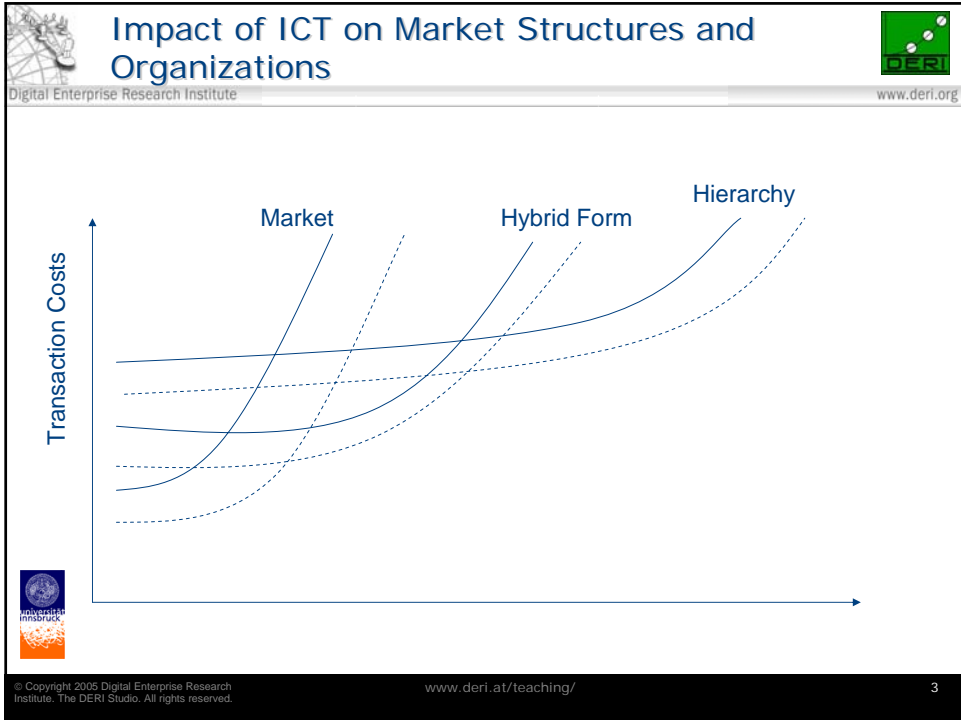
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- Further increase in specialization is limited by level of transaction costs (cost of coordination)
- Thus, technology and methodologies for reducing transaction costs are of utmost importance for future economic development.



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- # Project Management
- Digital Enterprise Research Institute  www.deri.org
- Project schedule
 - Project milestone
 - Project deadline
 - Critical path
- 
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Use of Project Management Tools

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Page 1 of 1
Date 12/10

Project Planning Documentation		Week														
System	Warehouse Inventory System (Modification)	Date														
System	Scheduled activity	Analyst	Signature													
Activity*	Individual assigned	Cecil Truman	1	2	3	4	5	6	7	8	9	10	11	12	13	14
B Requirements definition																
B.1 Form project team	VP, Cecil, Bev															
B.2 Define obj. and constraints	Cecil															
B.3 Interview warehouse staff for requirements report	Bev															
B.4 Organize requirements	Team															
B.5 VP review	VP, Team															
D - Design																
D.1 Revise program specs.	Bev															
D.2.1 Specify systems	Bev															
D.2.2 Specify reports	Bev															
D.2.3 Specify doc. changes	Cecil															
D.4 Management review	Team															
I - Implementation																
I.1 Code program changes	Bev															
I.2.1 Build test file	Team															
I.2.2 Build production file	Bev															
I.3 Revise production file	Cecil															
I.3.1 Test short file	Bev															
I.3.2 Test production file	Cecil															
I.3 Management review	Team															
I.6 Install warehouse*																
I.6.1 Train new procedures	Bev															
I.6.2 Install	Bev															
I.6.3 Management review	Team															

*Weekly team reviews not shown here
**Report for warehouses 2 through 5

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)

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Page 6

```

graph LR
    Start[Start Dishwasher] --> Runs[Dishwasher runs]
    Start --> Shower[Have Shower]
    Runs --> Drive[Drive to Work]
    Shower --> Coffee[Make Coffee]
    Coffee --> Drive
  
```

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Logistics





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- **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

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- 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

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Entering Text
Dear Sir:
Please ...

Speech
Hello!


Images




Video




Position Data





Voltages



Temperatures



1. Capture
2. Convert into **binary representation**

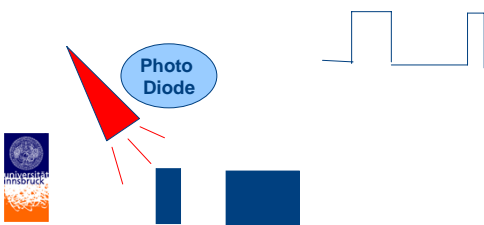




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Barcodes and Barcode Readers

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

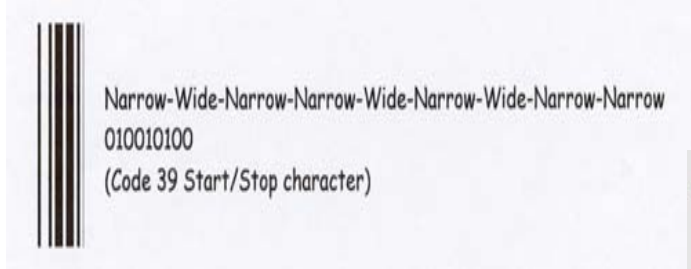




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Barcodes and Barcode Readers



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- 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

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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

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



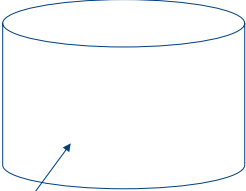
10% Off
Your next purchase up to \$2000*


Appliances, paint, flooring or anything else for your new home!

Coupon not redeemable for cash, is non-transferable and cannot be used in combination with any other coupon or discount. Limit one coupon per household. Good for a single purchase of merchandise only up to \$2,000. Not valid on previous sales, installation fees, the purchase of gift cards, or Maytag's Neptune(TM), General(TM) and Wide-By-Side(TM) refrigeration lines of major appliances. Also, not valid on Viking appliances in Nevada stores.

EMPLOYEE BAR CODE INSTRUCTIONS:
At any time during the transaction, please scan the Ser code.

470003080708327




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2D/3D Barcodes

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- 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

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

1234, T. Hepp

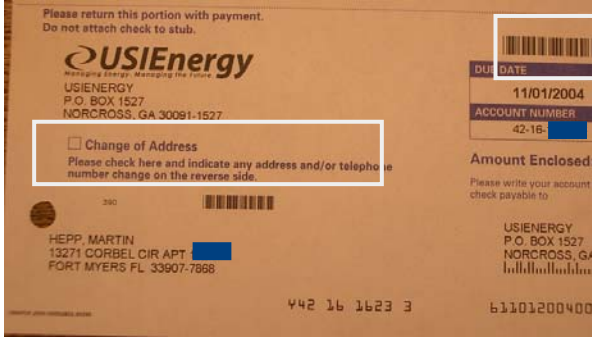
T = ?

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Data Collection from Paper Documents

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



The image shows a utility bill from USI Energy. A white box highlights a barcode and a checkbox labeled 'Change of Address'. The checkbox is currently unchecked. The bill includes the following information:

Please return this portion with payment.
Do not attach check to stub.

USI Energy
Managing Energy. Managing the Future.
USI ENERGY
P.O. BOX 1527
NORCROSS, GA 30091-1527

Change of Address
Please check here and indicate any address and/or telephone number change on the reverse side.

350

HEPP, MARTIN
13271 CORBEL CIR APT [REDACTED]
FORT MYERS FL 33907-7958

442 16 1623 3

61101200400

Amount Enclosed:
Please write your account check payable to:

USI ENERGY
P.O. BOX 1527
NORCROSS, GA

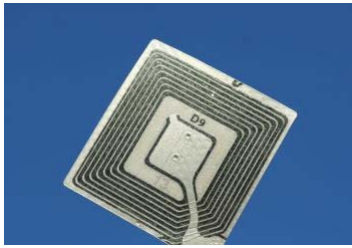
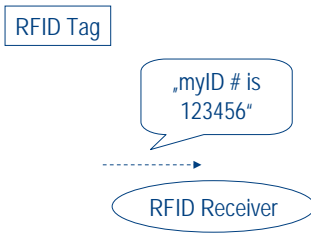
DUPLICATE DATE: 11/01/2004
ACCOUNT NUMBER: 42-16

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RFID

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

The diagram illustrates the communication between an RFID Tag and an RFID Receiver. The tag sends the message: "myID # is 123456".

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Power Supply by Induction (Passive)

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- 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.

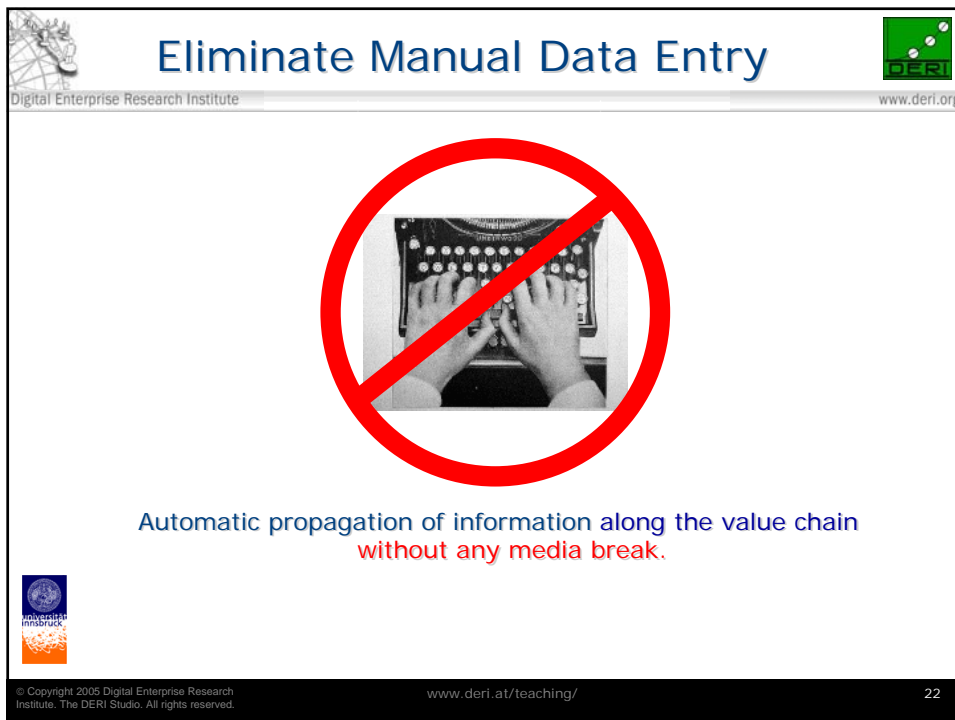
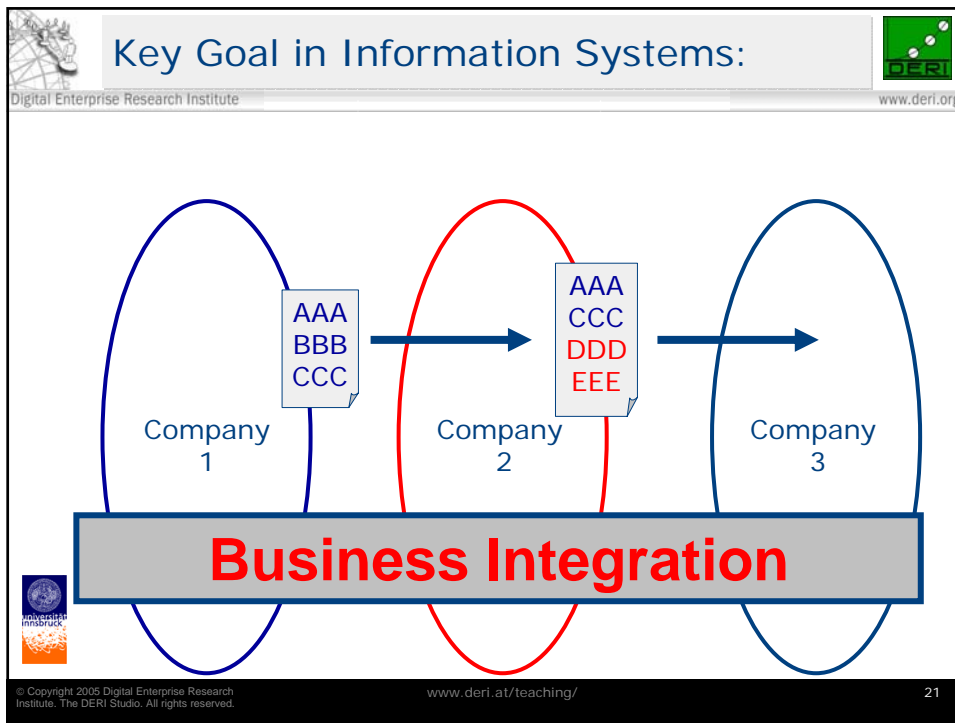
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Self-Powered RFID Tag (Active)

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- 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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Three Reasons and Their Ranks

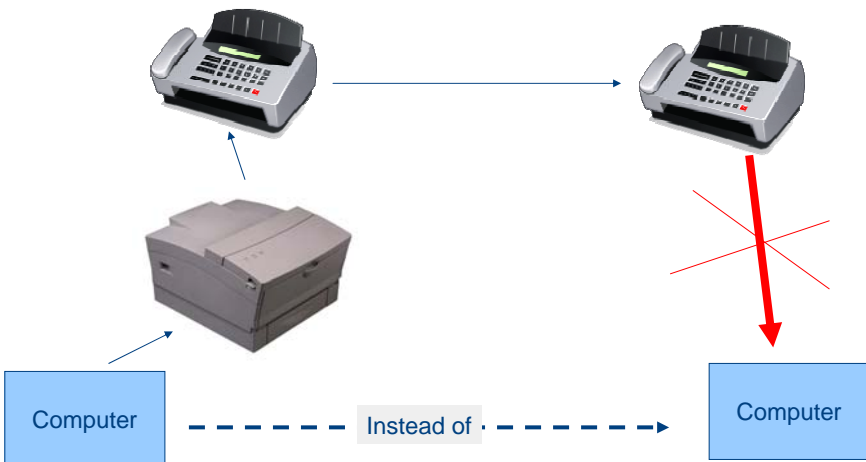
1. Consistency
2. Timeliness
3. Cost Reduction


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



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Media Break




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Put In Nonsense, Get Out Chaos



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- Accurate data is crucial.
- False or ambiguous data propagates and puts the integrity of the whole Information System at risk.
- This is an even bigger danger when multiple systems work together and exchange data.



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Timeliness



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- How can barcodes on products help to improve the timeliness of stock-related data in a company?



312312312

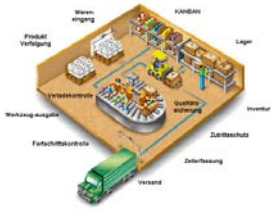


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Applications and Use Cases




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Parking



1970s



1980s

PARKPLATZ
WIESBADEN



10081343234111

Einfahrt:
06.01.2004 15:34

EINSTELLBEDINGUNGEN
SEHE AUSHANG

2000


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Volume / Weight-dependent Garbage Charge



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Ticketing and Access Control



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Rebate Vouchers

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[Home](#) [Help](#)

CHANGE YOUR ADDRESS ONLINE

SUCCESS!
 Your change of address request has been submitted. 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.

 <p>\$50 Visa® Gift Card When you open a new MyAccess Checking® account.</p> <p style="text-align: center;"><input type="checkbox"/> <input checked="" type="checkbox"/></p> <p style="text-align: center;"><small>Click for details</small></p>	 <p>10% OFF Your next purchase up to \$2000</p> <p style="text-align: center;"><input type="checkbox"/> <input checked="" type="checkbox"/></p> <p style="text-align: center;"><small>Click for details</small></p>
 <p>10% OFF Your entire purchase</p> <p style="text-align: center;"><input checked="" type="checkbox"/> <input type="checkbox"/></p> <p style="text-align: center;"><small>Click for details</small></p>	 <p>15% OFF Catalog and online orders of \$50 or more</p> <p style="text-align: center;"><input type="checkbox"/> <input checked="" type="checkbox"/></p> <p style="text-align: center;"><small>Click for details</small></p>

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Postage and Tracking

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Logo der Deutschen Post mit vergrößertem Posthorn

0,56 EUR ← Entgelt

MUSTER ← Absendedatum


OF2345678A 28.02.01

Matrixcode Markenzeichen Seriennummer

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What's that?

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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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