mass digitization

with the automatic bookscanner

ScanRobot®
1. Treventus Mechatronics GmbH
   a) What we are doing?
   b) Where we come from? → Story
2. Mass digitization with ScanRobot®
   a) ... in practical use (references)
   b) development together with our customers
3. ScanRobot®?
   a) Innovation & Benefits
   b) ... practical in use
1. TreVentus
1. TreVentus - ScanRobot®
1. the story...

- **2004:** pilot project „diploma students“
- **2005:** Patent pending
- **2006:** University of Technology SpinOFF
  TREVENTUS Mechatronics GmbH
- **2007:** European ICT-Grand Prize (CeBIT)
  dotated with 200.000 €
2. Mass digitization

digitization / mass digitization
“a closed project from 1000 books (or 500,000 pages) up...”

a) „first step“: analog $\rightarrow$ digital
   i. pre-processing
   ii. scanning
   iii. post-processing

b) „second step“: meta data
   i. insert data in repositories and databases
   ii. combination with catalog data

c) „last step“: visualisation / archiving / reprint
### 2. Mass digitization

<table>
<thead>
<tr>
<th>past</th>
<th>future</th>
</tr>
</thead>
<tbody>
<tr>
<td>by hand</td>
<td>automatic</td>
</tr>
<tr>
<td>3 – 8 page/min</td>
<td>up to 25 pages/min</td>
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</tbody>
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- mass digitization until now was a question about manpower
The ScanRobot™ Innovation

The Basic Concept in a nutshell

All three steps in book-digitalization
- Page separation
- Page turning
- Page scanning

are integrated here in one smooth and rapid automated process.

No rollers, no grippers – SR uses only gentle air-streams
The ScanRobot™ Innovation

Basic Components

- **Scan Head**
- **Optoelectronics** (cameras and illumination)
- **Book Cradle**
- **Book** (opened by 60 degrees)
- **Computer Workstation**
- **Software** for scanning and control (**ScanGate**)
The ScanRobot™ Innovation

ScanOperators workflow

1. Insert Book
2. Head down
3. Attracting 2 sheets
4. Head moves up scanning 2 pages
5. In top position turn page
6. Book is completely scanned
The ScanRobot™ Innovation

Optoelectronics and Image Processing

- **Image capturing**  
  (optics, µP controlled illumination, camera array)

- **High speed-DSPs**  
  (at camera level, parallel image pre-processing and image fusion)

- **Image transfer to workstation**  
  (USB 2.0 high speed, future: Gb and Tb Ethernet)

- **Forming a “digital object”**  
  (resembling content, structure and properties of the entire book including the meta-data)
The **ScanRobot™ Benefits**

- **Automatic page turning**
  (forward and backward)

- **High speed: up to 1500 pph**

- **Gentle to the book**
  (60 deg, airflow, cold LED light)

- **No image distortions**
  (scanning deep into binding)

- **Image processing in real time!**
  (deskewing, crop, Meta-Data etc.)

- "**First link in the value-chain**" in preserving the cultural heritage.
2. **ScanRobot®**
3. ...in practical use

Bavarian State Library (MDZ)

Digitization Center Göttingen (GDZ)

Library of University Innsbruck

Library of University Graz
3. ... @ the CeBIT 2008

- together with Digitization Centre of Göttingen GDZ (Goobi)
- 45,000 scanned pages during the CeBIT 2008
3. ... in practical use

Experience in practical use:

a) performance from 300 p/h up to 1,300 p/h
b) depending of the book characteristics
c) depending on the preparation

- Logistik & pre-processing
- optimization of a lot of small steps
  → good result
3. Experience

Experience regarding the throughput

a) NETTO between 300 pph and 1,200 pph

b) depending on book characteristics/preparation

![Diagram showing book setup and unloading times]

- **Book 1**: 340 pages, \( v = 1200 \text{ pph} = 20 \text{ ppm} \)
  - Setup: 5 minutes
  - Unload: 17 minutes

- **Book 2**: 690 pages, \( v = 1380 \text{ pph} = 23 \text{ ppm} \)
  - Setup: 3 minutes

**Throughput**: 1,030 pph

**Scantime**: 47 minutes

**Setup & Unload**: 13 minutes
The TreVentus Team

- Markus Barth
- Stephan Tratter
- Christoph Hörmann
- Christoph Bacher
- Christoph Bauer
- Prof. Wolfgang Zagler
- Univ. Doz. Leopold Sögner
What happens after all this digitization activities?

Video
Thank you for your attention

www.treventus.com