

Report

Title: Public Exhibition of Automated Book Scanners Hosted at the Bayerische StaatsBibliothek-
Munich 18th - 20th June 2008.
JISC Commissioned Report

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Table of Contents

- 1. **Report background.....3**
- 2. **About the author3**
- 3. **RBSpro manufactured by Qidenus Technologies4**
- 4. **APT Book Scan 1212/1600/2400/2400RA manufactured by Kirtas6**
- 5. **ScanRobot manufactured by Treventus8**
- 6. **DL3000 manufactured by 4DigitalBooks..... 10**
- 7. **Overall observations 12**

1. Report background

This JISC commissioned report provides feedback and observations on the public exhibition of automated book scanners held in Munich in June 2008 - <http://www.digital-collections.de/index.html?c=vmdz&l=en>. The event was attended at least by 59 registered delegates from Germany, Italy, Switzerland, France and Holland (see Appendix 1 for the list of participants). The exhibition was held over a 3 day period, 18-20 July 2008 and four exhibitors were present, Qidenus, Kirtas, Treventus and 4DigitalBooks. The former 3 exhibitors displayed their automated book turning hardware. An open seminar took place on the 19th June for the vendors to present their hardware. The seminar took place in German (except Kirtas and 4Digital Books). Links to the presentations are available at from the Seminar poster page at: <http://www.digital-collections.de/index.html?c=vmdz&l=en>

2. About the author

Julian Ball is the Manager of BOPCRIS - <http://www.soton.ac.uk/library/bopcris>, the Digitisation Centre based within the Hartley Library at the University of Southampton. He runs a digitisation laboratory with a number of hand operated CopiBook book scanners from I2S for delicate materials and the robotic Digitising Line book scanner from 4DigitalBooks. Staff specialise in the production of high quality images from archive materials with full technical and preservation metadata.

3. RBSpro manufactured by Qidenus Technologies



Contact details

Web site: <http://www.qidenus.com/english/index.php>

Email: qidenus@qidenus.com

Address: Qidenus Ges.m.b.H, Nedergasse 25/Top 5 A-1190 Vienna. Austria

Specifications

A book scanner new to the market capable of handling delicately bound books. Books are held in a cradle which can be set to angles of 60-90°. Pages are lifted with a rubber mounted bionic finger and turned with compressed air. Pages are held open by a large glass prism lying across the whole page area. Two cameras are mounted on either side and pages are photographed through the prism deep into the gutter. The scanner contains a large number of highly precisioned moving parts.

- Model: RBSpro
- Light source: LED cold light
- Light exposure: Continuous
- Optical system: Canon EOD SDLR family
- Resolution: 300-600dpi
- Image types: colour, greyscale and B&W
- Scan speed: 25 pages/minute 1500 pages/hour
- Book size minimum: 10 x 15cm
- Book size maximum: 25 x 35cm
- Book thickness: 10cm maximum
- Book covers: soft and rigid
- Book cradle angle: 60-90-120°
- Storage formats: JPG, TIFF, PNG, GIF, BMP, PDF
- OCR: Integral
- Metadata: XML
- Cabinet enclosure: Scanner is enclosed on 3 sides and by a hood to prevent extraneous light sources
- Power: 110-240V
- Operator requirements: present at all times

- Reference projects: AKH Wiener Neustadt, Dep. For Orthopaedic surgery. Archive of the Arch Dioceses of St Polten. Compass Publishing GmbH. Hoffelner Architects. Herbst-Vavrovsky-Kinsky attorneys. Collections of the Medical University of Vienna. University of Business Economy Vienna

Price and supply

- 125,000 Euros (20% discount on initial purchase)
- £99,006 (1 Euro= 0.79205 GBP Exchange rate 07/08/08)

Observations

- Page turning bionic finger takes considerable adjustment
- The mounted cameras though capturing high definition images utilise mechanical shutters. The shutters will require replacement after prolonged scanning, thus back up cameras would have to be kept in stock
- Scanner can not handle all book dimensions, handling only specific dimensions.
- Service from Austria
- Cameras enable to capture well into the book gutter with the use of the large glass prism
- High quality images produced from good optics

4. APT Book Scan 1212/1600/2400/2400RA manufactured by Kirtas



Contact details

Web site: www.kirtaseurope.com

Email: info@kirtas.com

Address: Kirtas Europe

Transistorstraat 60

1322 CG Almere

The Netherlands

Phone: + (31) 36 7111117

Fax + (31) 36 7111100

Specifications

A high precision book scanner with many moving parts. The range of scanners offered by Kirtas have been on the market for a number of years and the products are well tried and tested and provide quality images with high speed output. Pages are turned automatically, but an operator is required at all times to ensure page transition and to carry out QA. A range of models are available with varying scan speeds.

- Models: 1212/1600/2400/2400RA
- Optical system: 12.8 MP Canon EOS 5D digital camera, 24bit RGB, 4268 x 2912 pixels
- Light source: LED cold light
- Light exposure: Continuous
- Resolution: 300dpi with 600dpi interpolation
- Image types: colour, greyscale and B&W
- Scan speed: 1200-1600 images/hr
- Book size minimum: 11.5 x 17.8cm
- Book size maximum: 23.4 x 35.5cm
- Book thickness: 10.16cm maximum

- Book covers: soft and rigid
- Book cradle angle: 60°
- Paper thickness/weight: 49-300g/m²
- Software: BookScan Editor PRO, APT managers, BDE software license
- Storage formats: JPG, TIFF, PNG, GIF, BMP, PDF
- OCR: Integral utilising AbbyyMetadata: Retrieves descriptive metadata, DublinCore, MARC21, MODS and generates technical during book scanning
- Cabinet enclosure: Scanner is enclosed on 3 sides and by a hood to prevent extraneous light sources
- Transportability: Scanner is wheel mounted
- Operator requirements: Present at all times
- Power: 110-240V
- Selected customers: British Library (Microsoft project) University of Bologna, University of Tokyo, Cornell University, Emory University, Yale University, McMaster University, Government of Canada, Canadian national Archives, Novartis, Hong Kong University Library and Veba oil

Price and supply

- APT 1212
 - o 71,328 Euros
 - o £56,455 (1 Euro= 0.7914 GBP Exchange rate 08/08/08)
- APT 1600
 - o 96,662 Euros
 - o £76,506 (1 Euro= 0.7914 GBP Exchange rate 08/08/08)
- APT 2400
 - o 122,612 Euros
 - o £97,045 (1 Euro= 0.7914 GBP Exchange rate 08/08/08)
- APT 2400RA
 - o 129,099 Euros
 - o £102,180 (1 Euro= 0.7914 GBP Exchange rate 08/08/08)

Observations

- Individual pages are held in place by plastic clamps. These clamps will be captured if scanning takes place to the page edge
- Full time scanner operator required/ machine
- Highly engineered scanner with many moving parts. Backup machine would be required in a production environment
- Scanner housed in a hood to prevent extraneous light entering
- Limited to particular book dimensions
- Books are held in a 60° cradle, limiting any damage to the bindings
- Robust machine capable of scanning for long periods
- Mechanical shutters on the camera will require replacement after prolonged use
- UK distributor and service
- Fairly noisy machine for the operator
- High quality images produced from good optics

5. ScanRobot manufactured by Treventus



Contact details

Web site: http://www.treventus.com/index_en.html

Email: office@treventus.com

Address: Phorusgasse 8, A-1040. Vienna. Austria

Specifications

This scanner has been in preparation for at least 2 years and brings a new dimension to scanning. Fragile pages and delicate bindings may be safely scanned with this machine. Books are held in a walnut frame and opened to a maximum of 60° during the scanning procedure. Page pickup and turning are delicately undertaken. A solid glass prism drops to the gutter depth and pages either side are gently sucked onto the prism. Both pages are scanned as the prism vertically upwards. This is a well designed scanner, robust and capable of long hours of un-interrupted working. An operator could oversee the operation of a number these robotic scanners.

- Model: ScanRobot SR300 book scanner
- Optical system: Integral with linear CCD
- Light source: integral LED cold light. Low heat output, infrared or UV
- Light exposure: Few milliseconds
- Resolution: 300dpi
- Image types: colour, greyscale and B&W
- Scan speed: 25 pages/minute 1500 pages/hour
- Book size minimum: 32 x 12cm
- Book size maximum: 32 x 30cm
- Book covers: soft and rigid
- Book thickness: 12cm maximum
- Book cradle angle: 60°
- Paper thickness 60g/m²
- Scanner software: ScanGate
- Storage formats: JPG, TIFF, PNG, GIF, BMP, PDF
- OCR: Integral
- Metadata: XML
- Cabinet enclosure: Scanner is enclosed on 3 sides and by a hood to prevent extraneous light sources
- Transportability: Scanner is wheel mounted
- Power: 110-240V

- Reference customers & development partners: Bavarian State Library, University library of Innsbruck, Gottingen Digitising Centre, Graz University Library, Vienna University of Technology Library

Price and supply

- o 85,000 Euros
- o £67,324 (1 Euro= 0.79205 GBP Exchange rate 07/08/08)
- Scanner is available for purchase in the UK, directly from the manufacturer in Austria

Observations

- The SR300 is currently limited to book dimensions 32 x 30cm with a book thickness of 12cm. Further models will be produced for larger book formats
- The boards and spine can not be scanned with this scanner
- Modest scan rates
- 300dpi maximum resolution
- The prism is custom made and if scratched would be a costly replacement item.
- Camera contains no mechanical shutters
- Output of high quality imagery
- The book is held sensitively in an American walnut cradle
- Individual pages are delicately scanned and turned
- Quiet machine
- One operator would be capable of running a number of these machines
- Good capture of pages deep into the gutter

6. DL3000 manufactured by 4DigitalBooks



Contact details

Web site: www.4digitalbooks.com

Email: info2@4digitalbooks.com

Address: 4digitalbooks ASSY SA, Champs Courbes 23, 1024 Ecublens, Switzerland

Specifications

This scanner has been on the market for 4 years and is a highly precisioned tool. A user requirement survey was undertaken at the design stage and the scanner is designed to handle 90% of user's book scanning requirements. The scanner has been designed to run without an operator with many QA stages built into the software. One operator could run four of these scanners.

- Model: Digitising Line (DL) 3000
- Optical system: High resolution camera linear three-CCD. No interpolation using Bayer matrix
- Light source: LED cold light. Minimal output of heat, infrared and UV
- Light exposure: continuous
- Resolution: 300-600dpi
- Image types: colour, greyscale and B&W
- Scan speed: 3000 pages/hr
- Book size minimum: 14.8 x 21.0cm
- Book format maximum: 42.0 x 59.4cm
- Book covers: soft and rigid
- Book thickness: 12cm maximum
- Book cradle angle: 180°
- Paper thickness: 20-200g/m²
- Storage formats: TIFF, JPEG, PNG
- Transportability: Scanner is not movable
- Power: 400V 3 phase
- Availability: Scanner is available for purchase in the UK directly from the manufacturer in Switzerland. Service is carried out by staff from 4DigitalBooks in Switzerland.
- Site installation: University of Southampton, UK. Stanford University Libraries, California. Infotechnique SA, La Walck, France. Doseg Plus d.o.o. Ljubljana, Slovenia. Jouve SA, Mayenne, France

Price and supply

- Colour version
 - o 210,000 Euros
 - o £166,330 (1 Euro= 0.79205 GBP Exchange rate 07/08/08)

- Grey scale version
 - o 190,000 Euros
 - o £150,489 (1 Euro= 0.79205 GBP Exchange rate 07/08/08)

Observations

- A robust well designed scanner capable of running 24/7
- Books require a soft or rigid cover to be held by the scanner
- Once a book is set up, a scanner operator is not required until an intervention is necessary
- Camera contains no mechanical shutters
- Output of high quality images from linear CCD.
- Scanner is capable of handling books that close spontaneously due to binding
- The scanner is large and a permanent fixture
- Scanner is capable of scanning formats A2 to A6
- Delicately handles books, but does require material to be opened to 180°
- Scanner memorises book parameters that allows fast processing of similar books
- Scanner automatically detects and adapts to book parameters during scanning
- Material is pressed gently up to a glass plate ensuring a uniform flat image
- Many inbuilt QA protocols

7. Overall observations

The four automated book scanners exhibited at Munich have all been designed for specific book specifications and output criteria. There is no one scanner at the current time that meets all the requirements when considering source material, handling and output. Scanner suitability for particular book specifications are high-lighted below:

- Scanners from Kirtas, Qidenus and Treventus all scan bound volumes to a maximum size and thickness. The DL from 4DigitalBooks has been designed to take large formats to a maximum of A2. Scanning oversize pages, for example maps, large deeds, mortgage records and posters require specialist handling and large format scanners.
- Scanners from Kirtas use a page holding technology which places plastic clips on each page. These are captured during the scanning process. If scanning is required to the page edge these clips will be captured. Scanners from Qidenus, Treventus and 4DigitalBooks enable scans to the page edge without any scanner inclusions.
- The DL from 4DigitalBooks requires books to be opened to 120°, which for many bound volumes is acceptable. For volumes that can not be opened to 120°, scanners from Kirtas, Qidenus and Treventus use a book cradle with minimum opening of 60°.
- Page handling varied amongst the scanners and all are acceptable for certain paper types. Scanners from Kirtas, 4DitalBooks and Qidenus all require relatively robust paper types. The book scanner from Treventus is capable of handling less robust paper types. For paper that contains illustrated pages, Treventus have undertaken studies and determined that no paint loss occurs during their scanning process. We are unaware of similar studies from other manufacturers.
- Pages that contain any gold leaf would not be scanned on any of the current scanners.
- There is still a place for manually operated book scanners for particular bindings, paper quality, paper size and page content.
- Kirtas and Qidenus scanners rely on the use of digital cameras with mechanical shutters. After prolonged use of these shutters, replacements will be required. 4DigitalBooks and Treventus do not use mechanical shutters in their digital cameras and instead utilise linear CCD technology. Image quality is comparable.
- Scanners from 4DigitalBooks scan to 300-600dpi with true resolution without the use of Bayer matrix. Qidenus, Treventus and Kirtas all scan