8th International Bielefeld Conference 2006: Academic Library and Information Services: New Paradigms for the Digital Age

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INTRODUCTION

From 7-9 February 2006, Bielefeld University Library in North Rhine-Westphalia, Germany, was host to the 8th International Bielefeld Conference. The subject this year was Academic Library and Information Services: New Paradigms for the Digital Age. [1] The conference has been taking place every two years since 1992 and has proved to be one of the most popular forums for librarians and university managers from Europe and beyond to hear about and discuss new concepts, strategies, services, and technologies for academic and research libraries. This year's conference attracted almost 500 participants from 35 countries.

Opening of the conference by Norbert Lossau, Bielefeld University Library

The 8th International Bielefeld Conference focused on 'Information Services'. The World Wide Web has become the central platform for all types of information services. What does this mean for libraries and librarians? What role will they play and what needs to be changed?

The Program Committee, which included Norbert Lossau (Library Director and CIO Scholarly Information of Bielefeld University), Ronald Milne (Acting Director of Oxford University Library Services and Bodley's Librarian) and Hans Geleijnse (Director Library/IT-Services, CIO of Tilburg University), contributed greatly to the high profile of this conference. They invited speakers from 8 countries (Great Britain, the USA, Norway, Denmark, Italy, Belgium, the Netherlands, and Germany) who gave reports, in English and German, on current and future trends, concepts and experiences by considering the role of information services in the digital world. There were several main topics at the conference. The agenda included: Joint Strategies and Transnational Networks for Academic Libraries and Information Services; Re-thinking Information Services – Challenges for Library Managers and Innovative Services for Libraries; and Searching Scholarly Information in the Digital Age.

For the first time there were hands-on workshops in concurrent sessions during the conference. The main focus of these workshops was on archiving, marketing approaches in the library context, and institutional repositories.

RE-DEFINING THE LIBRARY

The conference was pleased to welcome Lynne Brindley, the Chief Executive of the British Library, as the keynote speaker. She started her talk with a review of the year 2005 that illustrated the complexity and rapidity of change within our information world. In 2005, Google began to digitise collections of five major libraries, the Open Content Alliance (OCA) with Yahoo and Microsoft was established, and Amazon began to offer a new service that allows book content to be purchased by chapter or page. Digitisation has become one of the main activities in many libraries. On the other hand subject librarians in some institutions are considered to be worth less compared with the Internet; and a number of libraries are facing a financial crisis.

Keynote speaker Lynne Brindley, The British Library.

Therefore the challenge for libraries in the 21st century is to find new ways to add value and remain relevant in this rapidly changing and competitive environment. It is important for libraries to challenge some historical assumptions and raise some basic questions. The British Library asked the following questions when formulating its new strategy in 2004/2005:

- How can we serve the needs of the new generation of end-users ("Google-generation") that use the World Wide Web as their primary information and knowledge resource?

- How can we continue to enable the research and learning process when it is taking place more and more in a virtual space outside the context of the library?

- How can we be relevant for those who have never set foot in a library?

- Does the library as a place have relevance and how should space be best used?

- Where should we focus in the information value chain and what should we not do?

- How can libraries provide effective stewardship of both digital and physical collections, and what is our role regarding non-traditional information types, such as e-Science data?

- How are publishing and intellectual property regimes changing, and how should we influence thinking on them and change in response?

- What types of skills do librarians need in order to exploit advances in technology and informatics, both to enhance knowledge exploration and presentation and to enable new ways of searching and mining their collections?

- What types of collaboration and alliances do libraries need to engage in to present coherent collections and to create innovative new products and services for content delivery?

Answers to these questions will be the basis for developing new roles and services and for investing in staff skills and technology infrastructure.

Lynne Brindley then set out some points that she believes will be crucial if libraries want to remain relevant in the 21st century:

- Know your users and keep close to them (and to your lost users and non-users).

- Re-think the physical spaces of the library and create a "desirable draw".

- Integrate marketing in your organisation and in the way you approach strategy and service development.

- Open up your legacy print collections to digital channels and reveal them through digitisation.

- Reduce legacy costs and continue to improve productivity in traditional library activities.

- Invest more in innovation and digital activities.

- Develop your staff and ensure that you have the right mix of skills.

Examples from The British Library underlined these issues.

Advances in digital technology, new publishing models, changing user behaviour and the impact of the web have transformed the way information is created, disseminated, stored and accessed, and this has become a great challenge for libraries. But there are many opportunities to play new roles and to define new services in order to address this fast moving and competitive environment, and especially to support research, learning and personal enrichment for the users.

JOINT STRATEGIES AND NETWORKS

After this keynote speech, four representatives from German institutions presented joint projects and initiatives for the developing of library and information services.

Christian Hasiewicz (Project Director at the Bertelsmann Stiftung) spoke about current trends and developments in Germany, especially about the strategic concept "Bibliothek 2007" that was created by the Federal Union of German Library and Information Associations (BID) and the Bertelsmann Stiftung. This concept is based on the best practices at German libraries (both public and academic) and an international best-practice-study in countries with exemplary national development of library and information services. The main goal of "Bibliothek 2007" is to encourage a broad discussion with politicians, business people and the public at a national level about the capability of libraries. This project also aims to help to improve the image of libraries and to contribute to the advanced integration of libraries into the educational system. "Bibliothek 2007" has proposed the establishment of a development agency for libraries, called BEA (Bibliotheks-EntwicklungsAgentur), as the central institution for innovation and quality at German libraries. Hasiewicz summarized his presentation with four essentials for future-oriented libraries. He pointed out that libraries have to:

- establish strong and effective partnerships,

- develop new services inspired by the World Wide Web,

- understand "quality" from a customer's perspective, and

- be self-confident about their strengths, using them for effective lobbying.

Sigrun Eckelmann (Programme Director within the department Academic Libraries and Information Systems (LIS) at the German Research Foundation) reported on "Knowledge Exchange". This network was officially launched on December 1, 2005. Its members are the following four national funding agencies that are active in the development of information infrastructures for teaching and research in their countries: JISC (Joint Information Systems Committee) from the UK, the SURF Foundation from the Netherlands, DEFF (Danish Electronic Research Library) from Denmark and DFG (German Research Foundation) from Germany. The network's goals are the improvement of information exchange and transfer in order to organise the national funding strategies more efficiently; the avoidance of redundancies in the development of new services; the development of standards for the interoperability of national services; a better understanding of cultural differences in order to learn from each other; and the creation of more opportunities for cooperation. The Knowledge Exchange office of this network is in Copenhagen.

Christel Mahnke (Head of Library and Information Services at the Goethe-Institute, Munich) showed how networks within the scope of WSIS (World Summit on the Information Society), IFLA (International Federation of Library Associations) and GATS (General Agreement on Trade in Services) are contributing towards bringing the views of German libraries into international discussion processes. Mahnke described how Goethe-Institutes abroad and their local partners are developing and realising projects that promote a democratic information infrastructure. She also talked about the UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions. This convention is of great importance for the Goethe-Institute because it is the first legal framework for international cultural exchange. Mahnke also spoke about certain projects within the UNESCO-programmes.

Academic libraries can no longer assume that their user communities automatically value them. Therefore they have to demonstrate the significance of their services. Roswitha Poll (formerly Director of the University and Regional Library Münster) discussed possible impacts and outcomes of library services and methods of assessing such impacts. Outcomes are defined by the Association of College & Research Libraries (ACRL) as "the ways in which library users are changed as a result of their contact with the library's resources and programs". In the digital age libraries have to show evidence of the benefits of using their services. There is an increasing demand for accountability, for showing the consequences of libraries' activities. The benefits for library users can be assessed in terms of more knowledge, better information literacy, higher academic or professional success, social inclusion, and increase in individual well-being. Poll explained the different methods that can be used to assess impacts. There are both quantitative (tests, performance monitoring, observations, analysis of publications) and qualitative (surveys, interviews, focus groups, discussion groups) measures. Poll presented projects that deal with assessing impacts and outcomes of library services.

One of these projects is the LIRG/SCONUL (Library and Information Research Group / Society of College, National, and University Libraries) Impact Initiative that was described in detail by Philip Payne (Librarian at Birkbeck College, University of London). This initiative is analysing the impact of higher education libraries on learning, teaching, and research. There are 22 institutions involved that have assessed the impact of particular services or innovations in their libraries, e.g. the impact of increasing the amount spent on electronic information services each year, the impact of an online information skills tutorial, or the impact of library support on the research process. The approach adopted in this initiative includes several stages: articulating service objectives, developing success criteria, creating impact measures, identifying evidence needs and choosing data collection methods. What did the participants achieve? They reported among other things a deeper understanding of how

the library supports academic processes, an improved dialogue with academics and stakeholders, a contribution to the development of library staff and a raised profile of the library within the organisation (Payne & Conyers, 2005). More information is available on the SCONUL web site.

Almost 500 participants attended the 8th International Bielefeld Conference.

RE-THINKING INFORMATION SERVICES

Libraries have always been places where information is collected and organised, where users get access to knowledge and where documents are preserved for future generations. But now the environment is changing faster and faster. There are continuous developments in information technology, the amount of information is rapidly increasing and the users' behaviours and needs have changed. Therefore libraries have to reshape and re-think their services and skills in order to maintain their relevance.

Michael A. Keller (University Librarian and Director of Academic Information Resources at Stanford University) reflected upon academic information services in the early 21st century. He started with indicators that constitute the 'perfect storm' in the information age:

- nearly ubiquitous network access, low cost computers and PDAs, plentiful magnetic memory;

- a commercial culture that is increasingly 'just in time' with ordering, delivery and payment services predicated on constant network access;

- Google, Yahoo, MSN and millions of information providers offering free or for-fee services;

- course management systems and collaboration environments and applications;

- institutional information environments lacking branding of the agencies responsible for them, namely the libraries.

All these factors result in new models and paradigms for various intermediary agencies such as libraries, publishers and other information providers. Keller introduced the Services Framework of the Digital Library Federation (DLF), an organisational tool to help managers think about the integration of systems, applications, and standards while keeping the perspective of users in view. Starting from the definition of a service, namely any functional component which is useful to talk about as a unit, several questions were raised about components and how they communicate:

- At what levels of granularity and aggregation should services be designed?

- How do we move existing services into a digital networked environment?

- How do we design services that are flexible and responsive?

- What machine and human interfaces should services support?

- How should services be designed so that they are reusable and interoperable?

- What functionality should be moved into a shared service infrastructure?

The Services Framework addresses these questions and provides specifically:

- a shared, consistent vocabulary for discussing library processes and services;

- common ground for talking about processes and services within and across libraries and for talking to other domains about how they might take advantage of library services;

- a basis for identifying reusable components and interoperability needs;

- a roadmap for identifying priorities for collaboration or development, and for identifying gaps and critical points.

The presentation of Reinhold Decker (Professor of Marketing at the University of Bielefeld) and Michael Höppner (Deputy Library Director at the University of Bielefeld) discussed requirements and conditions for implementing customer intelligence (CI) in modern libraries. "CI aims at gaining a comprehensive understanding of customers by means of intelligent tools, which enable a more pointed customer contact and a higher degree of customer loyalty". CI raises questions such as: Who are the customers? What needs do customers have? How do they use the library services? Based on these items Decker and Höppner described how a conceptual framework for a library system was developed, that is based on a datawarehouse approach that uses external and internal data to support strategic planning processes. They also presented an empirical example showing how methods from marketing research can be used to support decision-making in library management. Finally they concluded that meeting the customer intelligence challenge in libraries is much more than investing in modern IT infrastructure.

Mel Collier (Library Director and Professor at the Catholic University of Leuven) discussed whether convergence of libraries with other academic support services is relevant for European universities. A study done for the book "Managing academic support services in universities" (Hanson, 2005) shows that convergence is well established in Great Britain and the USA. In continental Europe there are some activities in Germany and Finland, otherwise convergence is almost non-existent. In this context convergence means the cooperation between library services, computing services, educational development services or other academic support services for managerial purposes. There are several models of convergence:

- common reporting lines to executive board members, with or without good cooperation;

- strategic coordination under a common director;

- service-level convergence, possibly with re-defined roles, jobs and titles.

The advantages are improved customer focus, a common approach to quality control, service flexibility, better technical approaches and investment, integrated planning, and operational cost savings. But there are also difficulties: the implementation requires much time and effort; there may be a fear of change and loss of identity; intensive staff development is needed; and there can be culture differences between professional groups. The study concludes that in most European countries convergence is a negligible feature in information services development in higher education.

What can an academic library contribute to scholarly publishing was the question raised by Sarah E. Thomas (University Librarian at the Cornell University Library). She introduced numerous publishing activities at Cornell University Library that strive for effective, widespread, and durable access to research. Cornell's Center for Innovative Publishing operates several services, e.g. the arXiv (an open access e-print archive), Project Euclid (a journal hosting service), DSpace (an open access repository system) and DCAPS (Digital Consulting & Production Services). Thomas described in detail DPubS (Digital Publishing System), an open source publication management software, which is being developed by Cornell University Library and Pennsylvania State University Libraries. DPubS will be used for the publication of grey literature, conference proceedings, journals, and online books. It can be employed by university presses, universities and libraries, institutional

repositories and scholarly societies. There are many reasons for library participation in the publishing process. Libraries have experience with end users of scholarly information, deep infrastructure, 24/7/365 service orientation, subject specialists, the ability to link authors and readers, commitment to the preservation of scholarly records and willingness to take risks. Thomas summarized her presentation by suggesting the following opportunities for libraries acting as publishers:

- collaboration with authors, scholarly societies, technologists, and other stakeholders to create a 21st century process for communicating and using scholarly research and information;

- development of closer partnerships with scholars in the act of knowledge creation;

- creation of economical tools and services that improve distribution and use;

- reduction of costs of sharing scholarly information and data for the academic community and society;

- lowering the barriers to access scholarly information and data.

Donatella Castelli (CNR-ISTI, the Institute of Information Science and Technology at the Italian National Research Council) spoke about the digital libraries of the future and the role libraries will be able to play. In the past, digital libraries have often been equivalent to physical libraries. Advances in digital technology, new information objects such as multimedia documents, and changing user behaviours have led to new requirements and needs. The creation and handling of documents in the digital library of the future require access to many different, large and heterogeneous information sources, use of specialised services and large processing capabilities. The digital library of the future has to provide a seamless environment where cooperative access, filtering, manipulation, generation, and preservation of documents will be supported as a continuous cycle. The DILIGENT project, of which Castelli is the Scientific Coordinator, serves this purpose. Its objective is to develop a digital library infrastructure on the basis of Grid-technology that will allow virtual e-Science communities to share knowledge and collaborate in a secure, coordinated, dynamic and cost-effective way. Libraries can play a role as both producer of resources and mediator between the infrastructure and the user communities. They can provide the necessary resources, define policies and standards, increase the amount of shared digital content (e.g. by digitisation), ensure the availability of content and its quality, or assist users by supplying the skills needed to select, update and exploit the digital library content and services.

The session on re-thinking library and information services ended with two talks about e-Research/e-Science and their implication for libraries. First, Liz Lyon (Director of UKOLN, the UK Office for Library Networking at the University of Bath) presented a simplified e-Research cycle and how it can be supported by library services. Looking to the future Lyon recommended that libraries:

- develop leadership and vision for engaging with e-Research,

- review organisational structures,

- provide e-Services for data (we "do" e-Learning so why not e-Research?),

- promote professional development of staff,

- build new partnerships and new business models.

Then, Tony Hey (Corporate Vice President of Technical Computing at Microsoft Inc.) discussed the e-Science vision and described how scientists are collaborating with computer specialists and the IT industry to create a new e-Infrastructure. He stated that e-Science is essentially the alliance of multidisciplinary science and the technologies to support distributed and collaborative scientific research. To support e-Science there is a need for a new e-Infrastructure. The following elements are seen as key for a global e-Infrastructure: high bandwidth research networks, development centres for open standard Grid middleware, technologies for data provenance, curation and preservation, open access to data and publications via interoperable repositories, discovery services and collaborative tools. Hey summarised his talk with the Microsoft strategy for e-Science: "Microsoft intends to work with the scientific and library communities to define open standards and/or interoperable high-level services, work flows and tools, and to assist the community in developing open scholarly communication and interoperable repositories".

SEARCHING SCHOLARLY INFORMATION IN THE DIGITAL AGE

A further area of emphasis at the conference was the searching of scholarly information. The emergence of the World Wide Web and Web searching has changed the environment in which researchers and students operate. Now, most users start their searches with a search engine and not with a library portal. Users want to have a single place to find research material, and the use of search systems has to be easy. These factors not only influence academic libraries, but also the academic publishing market. Several speakers discussed this subject from different perspectives.

Arie Jongejan (CEO at Swets Information Services) introduced Swets as the leading subscription services company, connecting the supply and demand chain that exists between publishers on the one hand and institutions, libraries and information centres on the other. He spoke about the changing market and the future role of the agent. Now value is defined in other terms than simply journal prices, and selection criteria have changed. The agent of the future has to reduce complexity and drive efficiency. Its role extends from administrative to explorative services. In that way agents can help to harmonise or normalise the relationship between the supplier and the consumer of information.

The presentation of Wim Jansen (Scientific Officer of the European Commission) illustrated what it means to work towards a new e-infrastructure that gives researchers unlimited access to knowledge, resources, information and people. The scientific community is confronted with growing needs for high capacity infrastructures for virtual communities, for long-term preservation of scientific and cultural data, for user needs in data curation and for better scholarly communication. This relates strongly to activities in the Sixth Framework Programme ([FP6](#)) of the European Union that was presented by Jansen. He also drew attention to actions in the upcoming Seventh Framework Programme ([FP7](#)) for research and technological development. Activities within this programme intend to involve and support more user communities beyond the e-Science world and to improve access to research information, research data and learning environments. It was shown that there is a strong need for an integrated information infrastructure to overcome problems in metadata exchange, functionality, interoperability, and usability.

Dirk Lewandowski (Department of Information Science at Heinrich-Heine-University Düsseldorf) focused in his presentation on the Academic Invisible Web (AIW). He started by presenting the different definitions from Sherman and Price ([Sherman, Price 2001](#)) and from Bergman ([Bergman 2001](#)). The Invisible Web contains pages consisting of images, audio or video, content in relational databases, disconnected pages as well as real-time and dynamically generated content. Lewandowski gave a clear picture of the real importance of the Invisible Web and the approaches being taken to index its content. He also attempted to explore the volume of the Invisible Web. Investigations led to the conclusion that previous calculations were wrong, and that it is extremely difficult to estimate the real volume of the Invisible Web. This talk also tackled the question of how the AIW can become visible. Open access repositories and search systems like Google Scholar, SCIRUS, BASE, and VASCODA are a beginning, but are not enough. This leads on to the recommendation that all protagonists should work together to make the Academic Invisible Web visible: the commercial search engine providers with their technical and financial power, the librarians with their experience in collection building and subject access, and the publishers and database vendors in opening their collections.

Anurag Acharya (Principal Engineer at Google Inc.) looked at searching and accessing scholarly literature from a Google Scholar perspective. [Google Scholar](#) is a service that provides a simple way to search broadly for scholarly information. From one place, students and researchers can search across many disciplines and sources: peer-reviewed papers, theses, books, preprints, technical reports, abstracts and articles. These can be from academic publishers, professional societies, repositories, universities and other scholarly institutions. The principles underlying the design of Google Scholar are: index all formats of materials, universal discovery, rank as researchers do, automate citation extraction, rank works and not individual documents, and link to offline content. At present Google Scholar is cooperating with about 600 libraries to ensure that users see links to the libraries' electronic holdings in the Google Scholar search results. The essential requirement for this service is a link resolver. Google Scholar uses the freely available resolver ScholarSFX for this purpose.

Bjørn Olstad (CTO at Fast Search & Transfer ASA, the main sponsor of the conference) introduced 'Contextual Search', a merging of three main approaches of [FAST](#) within modern information retrieval: intelligent text and data mining, flexible content structuring technologies and high-performing search technology. There are several new aspects that distinguish contextual search from other schema-flexible technologies: retrieval performance is 'industrial strength', data is weighted and filtered, contextual information improves precision while preserving recall, and the retrieval can be done in relation to a large number of recognised entities, such as persons, companies or places. The point of contextual search is not about finding a document, but about extracting more information from the document once found.

Ammy Vogtlander (Director Search at Elsevier) spoke about finding scholarly content in the age of Web searching from a publisher's perspective. She tried to give an answer to the question of how one can ensure that students, professionals and researchers will continue to find the information that is appropriate for their work or research. Searching has now overtaken browsing, there is an increasing amount of content available online, search methods differ by subject area, and researchers find more relevant content in less time. Students, researchers and professionals use Web search engines to find information because search engines are fast and easy to use, and they cover all types of information (articles, conference proceedings, grey literature, patents, news, people, home pages, etc.). Because of the increasing use of Web information, Elsevier launched Scirus in 2001. Scopus was introduced in 2004, verifying Web citations and including links in abstract records when Web documents are available. Vogtlander summarised her talk with proposals for the roles librarians can play: they should continue to review, select and recommend useful content sources and search systems, educate users and help develop standards and methods to improve the use of Web content and searching, and continue to watch out for new content sources and search platforms.

ARCHIVING, INSTITUTIONAL REPOSITORIES AND MARKETING

Beside the main sessions, three parallel hands-on workshops were offered in areas that libraries are especially focusing on at present: namely archiving, institutional repositories and marketing. One of the problems of the global information society is ensuring the long-term accessibility of digital documents. There were three lectures dealing with the subject of archiving.

Reinhard Altenhöner (Head of IT at Die Deutsche Bibliothek, the German national library) presented the German project "Co-operative development of a long-term digital information archive" (kopal) which is funded by the Federal Ministry of Education and Research. The objective of this project is the practical testing and implementation of a cooperatively created, long-term archival system for digital resources. The solution is based on the Digital Information Archiving System (DIAS) and will be extended with several functions.

Richard Boulderstone (Director of e-Strategy and Information Systems at the British Library) spoke about the British Library's archiving concept and its implementation. The British Library is a legal deposit library in Great Britain with legislation extended to include UK digital publications. Its vision is to design a large scale digital library to store, manage and preserve UK digital publications. That includes building a deposit architecture to meet redundancy, integrity, scalability and permanence challenges. The British Library will also collaborate with library, archive and commercial sectors in order to share expertise, reduce risks and minimise costs.

Erik Oltmans (Head of the Acquisitions & Processing Division at the National Library of the Netherlands - KB) introduced the policy of the KB regarding the archiving of electronic publications (KB e-Depot) and summarized the underlying principles:

- A Safe Place Network secures systematic, coordinated preservation.

- Publisher cooperation is essential to ensure timely deposit.

- Permanent archives presuppose permanent commitment.

- Permanent archiving also calls for a substantial investment and continuous efforts.

- The KB is committed to being part of a Safe Place Network.

Institutional repositories (IR) are proving to bring libraries closer to their users, especially to researchers and the research process. They can help to increase the visibility of universities and other research institutions and are beginning to change the system of scholarly communication. Six speakers discussed projects and experiences in this field.

First, Leo Waaijers (Manager of ICT and Research from SURF in the Netherlands) spoke about the Digital Academic Repositories (DARE) programme that is a joint initiative of all Dutch universities, the National Library, the Royal Netherlands Academy of Arts & Sciences, the Netherlands Organisation for Scientific Research and the SURF Foundation. The infrastructure is a network of OAI-compliant institutional repositories that preserve academic publications and research data. In 2004 DAREnet was launched, which gives access to the openly accessible content of the Dutch academic repositories and is searchable by institute, discipline and document type.

Mogens Sandfær (Director of the Center for Knowledge Technology at the Technical University of Denmark) presented institutional repositories in Sweden, Norway and Denmark. In Sweden there are at present 18 OAI-compliant repositories in operation, most of them based on DSpace or DIVA. The national project SVEP aims to create a national service based on harvesting local repositories. Norway has two main systems, NORA and FRIDA. NORA is the Norwegian Open Research Archive that currently contains more than 3,000 publications from six OAI-compliant archives. FRIDA is a joint system for research results that delivers information and documentation of research activities, currently at five universities. In addition, Norwegian universities and colleges have their own repositories. In Denmark, there is a trend towards combining local current research information systems (CRIS) and institutional repositories into one system. A new Danish research database network will be launched in spring 2006.

Vanessa Proudman (NEREUS Project Manager at the University of Tilburg) introduced NEREUS, a consortium of 16 universities and libraries from eight European countries with leading economics research ratings. Its objective is to facilitate professional knowledge exchange for innovation and first-class research through added-value online information services. Proudman also presented the service Economists Online (EO) that gives online access to the research results of leading economists and is based on institutional repositories. EO aims to increase the usability, accessibility and visibility of European top economists research by digitising, organising, archiving and disseminating the whole academic output of some of Europe's leading economists.

Dirk Pieper (Head of Acquisitions & Digital Library) and Friedrich Summann (Head of IT), both from Bielefeld University Library, presented the Bielefeld Academic Search Engine (BASE), an end-user oriented institutional repository search service. BASE uses the search technology of FAST Search & Transfer and can harvest and index data from different sources. This search engine contains at present OAI metadata, fulltext articles, digital text collections, bibliographic data and parts of the Bielefeld University Library catalogue.

Finally, Susanne Dobratz (Head of the Joint Electronic Publishing Group of the University Library and the Computer and Media Services at Humboldt University Berlin) introduced the DINI certificate for document and publication repositories. This certificate is intended to network repositories by pushing the use of standards and promoting interoperability and cooperation between German higher education institutions. It requires criteria in the following areas to be met: server policy, author support, legal issues, authenticity and data integrity, indexing, statistics and impact, and long-term preservation.

In the context of changing educational environments, discussions are taking place about the strategic development of academic libraries, which highlight the need for fundamental change. Libraries need to be more focused on cost-effectiveness, performance measurement, quality standards and user acceptance if they want to continue to have a significant effect on their status within the universities. Three presentations addressed marketing and management problems.

Antonia Hermelbracht (Department of Business Administration and Economics) and Bettina Koeper (Administrative Librarian), both from the University of Bielefeld, presented the project ProSeBiCA (Development of New Library Services by Means of Conjoint Analysis), funded by the German Research Foundation. This project aims to develop an analysis and simulation framework, which will allow academic libraries to create a design for the strategic planning of future services.

Sayeed Choudhury (Associate Director for Library Digital Programs at the Sheridan Libraries of the Johns Hopkins University) explained the CAPM (Comprehensive Access to Printed Materials) evaluation methodology that is looking at users' preferences or choices in the implementation of a special library service.

Colleen Cook (Dean at Texas A&M University Libraries) and Fred Heath (Vice Provost and Director of University of Texas Libraries) spoke about LibQUAL+™, which is a service that helps librarians to ask for and better understand user perceptions of service quality. The essential part of this programme is a web-based survey that assists libraries to change their organisational culture, market the library and assess and improve library services. LibQUAL+™ is a partnership between the Association of Research Libraries (ARL) and the Texas A&M University. More than 700 institutions participated in this survey. This programme was initially developed for research libraries, but it can now be used by all types of higher education institutions.

An exhibition of leading and well-known service providers, publishing houses, and producers of library software and communication technology accompanied the conference. More than 35 companies and institutions presented their products and services in poster sessions and demonstrations.

More than 35 companies and institutions were presented in the exhibition.

CONCLUSIONS

The participants of the 8th International Bielefeld Conference had the opportunity to discuss the latest trends, concepts and experiences in information services. The main issues were the evaluation and restructuring of traditional library services, the relevance of national and international partnerships, the use of customer intelligence methods to support strategic processes in libraries, e-Science and e-Infrastructure, the future role of publishers, and the future of searching in academia.

In the course of their history academic libraries have played different roles. They have been information providers, knowledge preservers, and quality guarantors. At present, libraries also play a central role as service providers. The size of a library collection and its quality are no longer crucial success factors: the critical success factor has become user orientation. Attractiveness for students and scientists depends significantly on the information services academic libraries can offer.

But the environment is rapidly changing due to advances in digital technology, new publishing models, changing user behaviour and the impact of the Web. This has become a great challenge for libraries. Now it is no longer enough to build a modern digital library; there needs to be cooperation between libraries, search engines, open archives, publishers, and others that support the learning and research process. In fact, cooperation was a key word in most presentations.

The conference talks and discussions showed that due to the developments and changes in the digital age, academic libraries have to re-think their role and define new services in order to provide added value for their customers. Libraries should integrate their digital services into the work processes of students and scholars in such a way that they can be more successful.

In the future, the importance of academic libraries will be measured by the benefits that they offer to their users. Lynne Brindley summed this up with her striking comment in the keynote speech that "there is no choice but to change and to do it quickly if libraries want to survive".

NOTES

1. The conference presentations are available online at http://conference.ub.uni-bielefeld.de/2006/docs/ in E-LIS, at: http://tinyurl.com/ksoc4. The proceedings of the conference will be published in Library Hi Tech.

REFERENCES

Bergman, Michael K.: "The Deep Web: Surfacing Hidden Value". *The Journal of Electronic Publishing*, 7(2001)1. http://www.press.umich.edu/jep/07-01/bergman.html .

Hanson, Terry (Ed.): *Managing academic support services in universities*, London : Facet, 2005.

Payne, Philip and Angela Conyers: "Measuring the Impact of Higher Education Libraries: the LIRG/SCONUL Impact Implementation Initiative". Library and Information Research, 29(2005)91. Special issue on the LIRG/SCONUL Impact Initiative. http://www.cilip.org.uk/NR/rdonlyres/0C8BD489-3C05-452A-BFF3-A06FB3B3CAAA/0/91_impact_higher_ed.pdf

Sherman, Chris, and Price, Gary: *The Invisible Web: Uncovering Information Sources Search Engines Can't See*, Medford, NJ : Information Today, 2001.

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Amazon. http://www.amazon.com/

ArXiv.org. http://arxiv.org/

BASE - Bielefeld Academic Search Engine. http://base.ub.uni-bielefeld.de/index.html

Bertelsmann Stiftung. http://en.bertelsmann-stiftung.de/

Bibliothek 2007. http://www.bibliothek2007.de/

BID - Bibliothek & Information Deutschland / Federal Union of German Library and Information Associations. http://www.bideutschland.de/englisch/index.html

CAPM - Comprehensive Access to Printed Materials. http://dkc.jhu.edu/CAPM/

DARE – Digital Academic Repositories. http://www.darenet.nl/en/page/language.view/home

DCAPS - Digital Consulting and Production Services. http://dcaps.library.cornell.edu/

DEFF - Denmark's Electronic Research Library. http://www.deff.dk/default.aspx?lang=english

DINI - Deutsche Initiative für Netzwerkinformation. http://www.dini.de/zertifikat/

DFG -Deutsche Forschungsgemeinschaft. http://www.dfg.de/en/index.html

DIAS - Digital Information Archiving System. http://www-5.ibm.com/nl/dias/

DILIGENT project. http://www.diligentproject.org/

DLF - Digital Library Federation. http://www.diglib.org/

DLF Services Framework. http://www.diglib.org/architectures/serviceframe/index.htm

DPubS - Digital Publishing System. http://dpubs.org

Dspace. http://www.dspace.org/

Economists online. http://www.tilburguniversity.nl/services/library/projects/scholarunlock.html

FAST Search & Transfer. http://www.fastsearch.com/

FP6 - Sixth Framework Programme. http://fp6.cordis.lu/index.cfm?fuseaction=UserSite.FP6HomePage

FP7 - Seventh Framework Programme. http://cordis.europa.eu.int/fp7/

FRIDA. http://www.uib.no/frida/

GATS - General Agreement on Trade in Services. http://www.wto.org/english/tratop_e/serv_e/serv_e.htm

Google. http://www.google.com/

Google Scholar. http://scholar.google.com/

IFLA - International Federation of Library Associations. http://www.ifla.org/

JISC - Joint Information Systems Committee. http://www.jisc.ac.uk/

KB e-Depot. http://www.kb.nl/dnp/e-depot/e-depot-en.html

KE - Knowledge Exchange. http://www.bs.dk/content.aspx?itemguid={4B05921E-D79F-4084-B5E3-C59EB943639B}

Kopal - Kooperativer Aufbau einer Langzeitarchivs digitaler Informationen. http://kopal.langzeitarchivierung.de/

LibQUAL+^{TM}. http://www.libqual.org/

Microsoft. http://www.microsoft.com/

Nereus. http://www.nereus4economics.info/

NORA - Norwegian Open Research Archive. http://www.ub.uio.no/nora/

OCA - Open Content Alliance. http://www.opencontentalliance.org/

Project Euclid. http://projecteuclid.org/

ProSeBiCA. http://www.ub.uni-bielefeld.de/biblio/projects/conjoint_web.htm

Scirus. http://www.scirus.com/srsapp/

SCONUL - Society of College, National and University Libraries. http://www.sconul.ac.uk/

SCONUL/LIRG Impact Initiative. http://www.sconul.ac.uk/activities/performance/impact2.html

Scopus. http://www.scopus.com/scopus/home.url

SURF – SURF Foundation. http://www.surf.nl/en/home/index.php

SVEP. http://www.svep-projekt.se/english/

Yahoo. http://www.yahoo.com/

UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions. http://portal.unesco.org/culture/en/ev.php-URL_ID=29388&URL_DO=DO_TOPIC&URL_SECTION=201.html

WSIS - World Summit on the Information Society. http://www.itu.int/wsis/