

# From Paper Archive To Digital Repository of Academic Staff Publications

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## Abstract

In academic environment there is an important stock of not easily accessible university publications available and produced for many years. Digital library of university publications together with a good technical infrastructure can significantly empower the education and research in a global frame. Effective cooperation of authors, university management and university library is a basic assumption for a success of digital library project of university internal production.

In this paper we provide the short overview of the legislation frame and current situation in digital library initiative and registration of intellectual output of university community in Slovakia. We also describe the development and the implementation of the open digital library system designed and built to submit, store, search over and disseminate the academic publications and provide other relevant services to university staff and management. The idea is to create the open digital library system that addresses the specific needs of the internal university environment as well as allow other researchers with no prior knowledge of the repository existence to locate materials of their research interests.

## Key Words

digital library, digital library project, registration of academic publications, information system design, institutional repository, academic library.

## Background

The library Network in Slovakia is a part of the State Information Network. It includes: Slovak National Library in Martin, 8 scientific libraries, 44 academic libraries (central university libraries and faculty libraries), public libraries (36 regional, 100 municipal, 303 community libraries with professional staff, 2 218 community libraries without professional staff), 5 996 school libraries and special libraries (libraries of churches and religious associations, medical libraries, technical libraries, libraries of the armed forces, agricultural libraries, prison libraries, libraries of museums and galleries, and administrative and economic libraries).

The current digital library research and initiatives in Slovakia are based on the international initiatives (Digicult, Cultivate, eEurope+, eEurope 2005). They are supported by the Slovak government with the vision to [1] *enable any citizen to access all human knowledge any time and anywhere, in a friendly, efficient and effective way by overcoming barriers of distance, language and culture, and by using multiple internet-connected devices.*

The Slovak library community and the Slovak government have adopted several important documents in which the creation of open national digital archives and development of access tools for the support of research and education are viewed as a community priority:

- (1) The Resolution No.43/2004 concerning the Strategy of the society informatization and the Action plan.

- (2) Resolution No. 801/2002 concerning the library automation and networking programme.
- (3) The Resolution No.310/2001 concerning the The Slovak Librarianship Development Strategy 2003 until 2006.

### **Academic libraries, documentation and presentation of Science and Education in Slovakia**

Maintenance and bibliographic registration of published documents produced by staff at universities (teachers, researchers and postgraduate students) is one of the main functions of Slovak academic libraries according to the Slovak Library Act [2] valid from 2000. Intellectual output of university teachers and researchers play a significant role in the scientometric research and serve as indicator of university quality. Personal and institutional bibliographies are important sources for evaluation and accreditation purposes and for the qualification progress of individuals recognized by the Slovak Ministry of Education.

In 1998 the first initiative toward the acceptance of the cooperative system for processing of the publication activity data of scientific and academic institutions in Slovakia arose within the national project called Pro Scientia [3]. The main idea of project was to create conditions for building up a national virtual bibliographic database accessible via internet. As a project result the first written procedures were prepared for the description, processing and presentation of records based on international standards and recommendations (AACR2, UNIMARC, ISO 2709, ISBD, STN ISO 690, Z39.50). The procedures were accepted and subsequently adapted by majority of Slovak academic libraries. The next continuation of the pilot project during 2001-2003 was focused mostly on the series of instruction courses for the academic librarians (AACR2, UNIMARC, USMARC, the use of the national categorization of the publication activity [4], processing of statistics etc.) and implementation of software and hardware equipment at the cooperative institutions [5].

### **Digital library initiative at the Technical University Košice**

The University Library of the Technical University Košice (TUK) has processed the intellectual output of the TUK staff since 1986 according to national rules (based on international standards), procedures and categorization. The internal TUK procedures for the registration of publications at library were not popular among the authors. According those procedures library started the processing of the document after author prior initiated this by filled in print form delivered to library together with the print copy of the publication (or its relevant parts needed for library processing). The data about document have been processed in currently available library system (CDS ISIS, Aleph 300, Aleph 500) and accessible via OPAC as bibliographic records. The outputs from the system was not usable for accreditation purposes, so some departments and faculties maintained their own system for registration of publications and created required outputs manually. The print archive has been closed for library users and its main function was reduced to "prove the document existence" only without support of preservation and dissemination function of university's intellectual capital. The new digital library technologies brought technology solution for the change.

In 2001 the first digital library initiative, supported by TUK management and based on the internal production of staff at TUK, originated at library. TUK digital library intention is to create an open interoperable digital repository addressing inside and outside university aims:

- provide complex support of the current model of staff output registration for regular accreditation and evaluation purposes at Ministry of Education for faculties and individuals (authors),
- enhance alternative scholarly communication model (self-publishing and posting research online to repository as a model for expanding scholarly communication),
- enable cost effective and flexible future extension to submission of other content (student's thesis, author's pre-prints), implement possible changes (data formats and categorization of publications), interconnection with other library agenda (assigning ISBN for books published at TUK),
- support of interoperability with other systems (national system for registration of academic publication ProScientia, OAI initiative and PMH protocol for global cross searchable repository),
- preserve intellectual capital of TUK,
- reduce barriers to access the digital intellectual capital of TUK within and outside the university, enable 7/24 access to textbooks and digital materials for the support of research and education (saving intellectual property conditions).

UK digital library system EPC TU [6] has been designed with following main functions (see Figure 1 and Figure 2):

- electronic submission of inputs for registration: creation of descriptive metadata by authors through filling in dynamically generated fields of web forms (according to document type), with possibility of uploading of primary document, at present without strictly defined data format),
- digitization,
- bibliographic control: verification of data submitted in e-forms with digital copy of document, addition of administrative metadata,
- quality control (digital image and bibliographic record),
- search and data presentation in various formats (html, doc, pdf, xml),
- structured and standardized reports (bibliographies) and statistics generated automatically for various purposes (accreditations of faculties, bibliographies of faculties and individuals for grant applications, etc.),
- user support (online helps),
- access rights management: web based defining the access rights to documents and versions (after the implementation of digital signature).

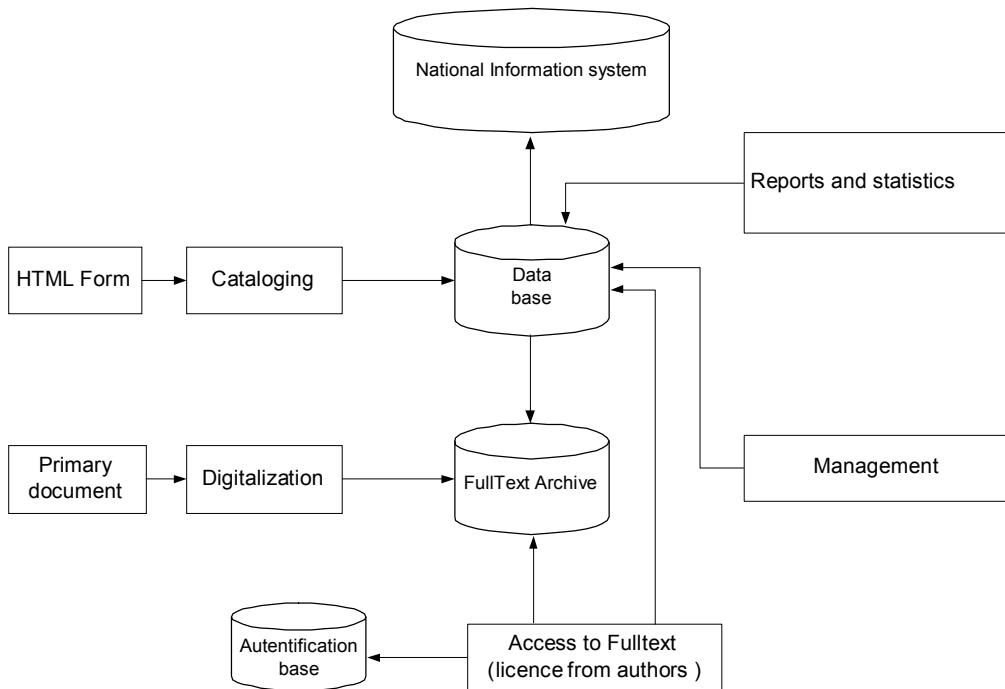


Figure 1. EPC functional model

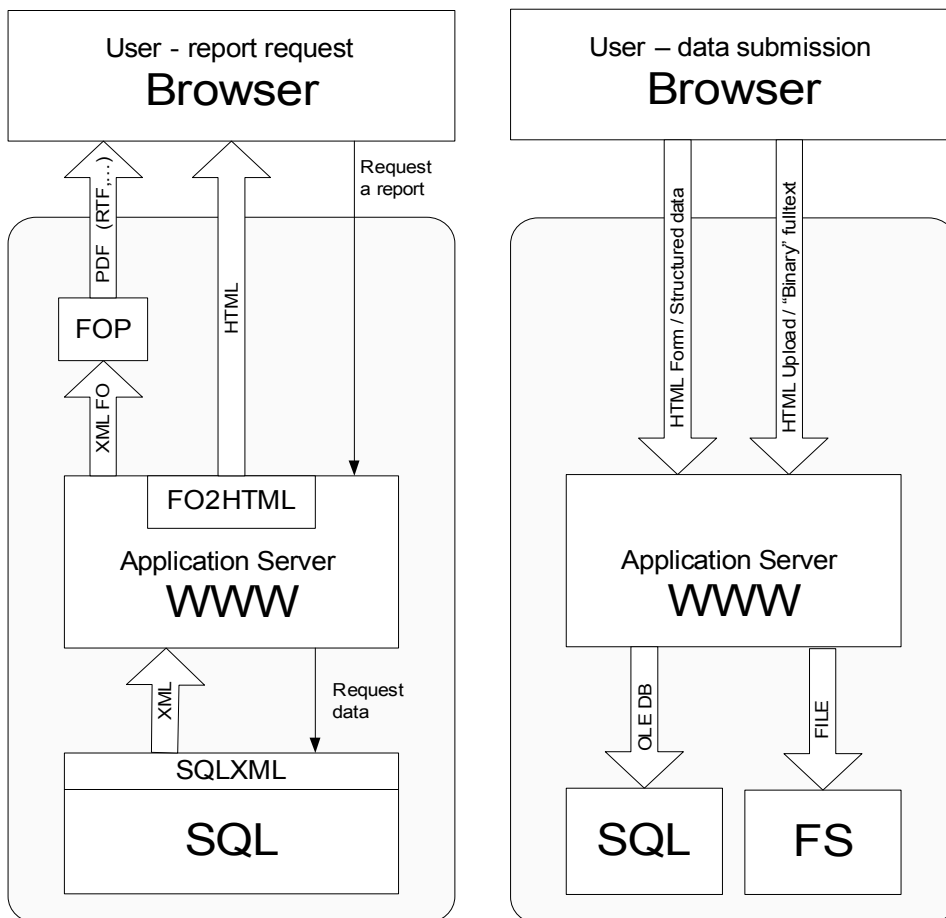


Figure 2. EPC TU technology overview

## Cooperative creation of digital repository at the TUK

The creation of institutional repository of university intellectual output is not only the difficult task for the library digital project management, but it presumes cooperation at whole university level. The main areas of cooperation are the following:

- definition of organizational rules and procedures for the cooperation of authors, faculty and university management with library,
- creation of repository policy and its flexible control (repository content, content management, access rights management system for inside and outside TUK users),
- creation of technical infrastructure for preservation and long term access to digital content,
- definition of basic requirements for system (simple submission of inputs, easy and intuitive search interface, automatic generation of outputs in various formats).

In January 2003, after many discussions and meetings of representatives of library with faculties and university management, after finishing the development and internal testing of the main system functions, library implemented the following modules: submission module with online helps, digitization and outputs & statistics module.

The TUK submission system is based on dynamic web based forms. Each form has a unique *archival number* and *password* generated automatically. The archival number bounds together the form, the bibliographic record and the digital copy of the document. It is a unique number available during all steps of record processing and existence. *Password* together with *archiving number* is needed for submission of request to record content changes, or digital content change (form edit).

The electronic submission system increased 3-times the number of submitted documents for registration to library in comparison with the previous paper based system. Because of co-operative creation of metadata (descriptive metadata are created by authors) and automation of manual processes, the increased number of submissions does not represent the need for the staff increase at cataloguing unit. On the other hand the need for new high-qualified staff positions has increased (digital library manager, system analyst, programmer, quality control staff, PR staff).

At present the database of TUK publication activity consists of about 20.000 records describing publications and citations of authors from TUK. The TUK digital archive consists of about 5.000 digital titles, which represents about 60.000 digital pages produced from January 2003 till April 2004 (digitization, or conversion of uploaded files to TIFF format), by staff of 2 librarians and daily total 5 hrs of work. The digital archive consists of following document types: proceeding papers (37%), citations (33%), journal papers (18%), monographs (books, text books, teaching materials – 6%), other types of documents (6%). The digital archive is currently not available to public. We hope that first digital documents will be available this year after the solution of legislative questions (intellectual property and copyright) at TUK.

The outputs & statistics module is still under development. Currently it provides two types of outputs in basic *html* format only. Despite of the current reduced functionality of outputs module, it is the frequently used part of the system, especially by management. Authors are also using the outputs, but the problem is with incompleteness of their bibliography, because their older works (publication

year older than 2002) might not be submitted and thus registered at library. On the basis of electronic submission and upload or physical delivery of primary print document for digitization, library process also older publications of TUK authors.

### **Future development and projects**

The implementation of open digital university repository and transition from closed paper-based archive to digital university repository represents a qualitative change. This change enlarges amount of available cross-searchable information, lower barrier to access and enable direct access to widest (global) academic production and research. On the other hand, implementation of university repository brings complex of problems, which solution might come slowly step-by-step, not immediately. Some solutions, mainly from technology area, are already tested and available (OAI initiative and tools), but other solutions are totally new at Slovak academic environment (repository as a new model of scholarly communication), or even currently do not exist at our academic environment (unified explanation of current legislative on digital distribution of university research).

The TUK digital library project represents the pilot initiative of this kind in Slovakia. The experiences gained at TUK can be utilized and shared with colleagues at other Slovak universities. UL TUK also appreciate collaboration at international level with colleagues already implementing or thinking of implementation of academic institutional repository. As a first step in future possible national collaboration, UL TUK recently cooperated in national project proposal "Creation a digital library of university staff publications at Slovak universities" submitted to Ministry of Education grant scheme for 2004. In case of its approval, 12 Slovak universities represented by 15 academic libraries will cooperate in development of digital library system and hopefully fasten the process and increase the amount of open access research content.

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