
DIGITIZATION PROJECTS CARRIED OUT BY THE MATHEMATICAL INSTITUTE BELGRADE

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Abstract: In this paper some current digitization projects carried out by the Mathematical Institute of Serbian Academy of Science and Arts Belgrade and the Faculty of Mathematics Belgrade are described. The projects concern developing of a virtual library of retro-digitized books and an Internet data base and presentation of electronic editions of some leading Serbian journals in science and arts, and the work on the South-Eastern European Digitization Initiative (SEEDI).

Keywords: digitization, cultural heritage, scientific heritage, virtual library, SEEDI

Introduction

The Mathematical Institute of Serbian Academy of Science and Arts Belgrade and the Faculty of Mathematics Belgrade carried out some digitization projects in the last decade. The projects concern cultural and scientific heritage digitization as a very broad field. Some of the most important projects are:

1. PANDORA, an expert system for archaeology (1993-1994)
2. Computer archiving and multimedia presentation of cultural values and national heritage (1995-1996)
3. Archiving the journal Publications de l'Institut Mathématique (1995-) [5, 9]
4. Collected works of Bogdan Gavrilović (1996-2001)
5. Old maps, engravings and photographs – Collection of the City Museum of Belgrade (1996-1997, 2004) [6,8]
6. Presentation of Historical Archive of town Kotor (1996-1997)
7. Memorial compact disk of the Faculty of Mathematics in Belgrade (1998)
8. The work on the foundation of the National Center for Digitization (2002-) [16]

which are described in detail in [13].

In this paper we present some new projects of our institutions that are now in progress: developing of a virtual library of retro-digitized books and an Internet data base and presentation of electronic editions of some leading Serbian journals in science and arts, and the work on the South-Eastern European Digitization Initiative (SEEDI) [17].

Virtual Library of Retro-digitized Books

Working on digitization of elderly works of Serbian authors in mathematical sciences was a part of some earlier projects, for example of the Collected works of Bogdan Gavrilović and the Memorial compact disk of the Faculty of Mathematics in Belgrade. Now, it is a project by itself leaded by Ž. Mijajlović. The aim is to create a comprehensive and interconnected collection of retro-digitized books and other digital documents written by our mathematicians or somehow connected to Serbia and Montenegro. The original works are mostly from the XIX century and the beginning of XX century. So far the following books and PhD-theses were digitized:

1. Boscovich Rogherio, Elementorum Universae Matheseos Tomus I, II, III, 1757
2. Dimitrije Danić, Konformno preslikavanje eliptičnog paraboloida na ravan, Jena, 1885.
3. Bogdan Gavrilović, Formiranje jednoznačnih analitičkih funkcija, Budapest, 1886.
4. M. J. Andonović, Kosmografija, Beograd, 1888.
5. Kosta Stojanović, Atomistika, Niš, 1892.
6. Đorđe Petković, Abelova teorema dokazana algebarski pomoću Riemann-ove teorije funkcija, Beč, 1893.

7. Mihailo Petrović, Sur les zéros et les infinis des intégrales des équations différentielles algébriques, Paris, 1894.
8. Petar Vukićević, Die Invarianten der Linearen Homogenen Differential-Gleichungen nTER Ordnung, Berlin, 1894.
9. Mijalko V. Ćirić, Racionalna Mekanika (Sveska prva), Beograd, 1897.
10. Bogdan Gavrilović, Teorija determinanata, Beograd, 1899.
11. Mladen Berić, Figurativni poligoni diferencijalnih jednačina prvog reda, Beograd, 1912.
12. Sima Marković, Opšta Riccati-eva jednačina prvog reda, Beograd, 1913.
13. Konstantin Orlov, Aritmetičke i analitičke primene matematičkih spektara, Beograd, 1934.
14. Đuro Kurepa, Ensembles ordonnés et ramifiés, Paris, 1935.
15. Milutin Milanković, Nebeska mehanika, Beograd, 1935.

At the moment a catalogue containing more than 500 items that belong to the libraries of the Faculty of mathematics and the Mathematical institute is under construction. We are also looking for the best way to present the digitized material at the Internet, which will ensure long-term durability and availability. One of the promising possibilities is to use the approach suggested by the National Library of the Czech Republic in the framework of the Memoria programme [12].

A more detailed description of this project is given in [14].

Internet Database and Presentation of Electronic Editions of Leading Serbian Journals in Science and Arts

This project is cooperation between "Communication" [2] non-governmental organization and the Mathematical institute. A group of scientists and members of University of Belgrade formed "Communication" in order to promote understanding between people and nations in the region of former Yugoslavia and abroad. The idea was that a good starting point for improving communication between those nations with the same or very similar languages might be science and culture. According to that, it was decided to form an Internet database of freely accessible full-text journals [3] in those fields. The project leader is D. Grbić, while collaborators are Z. Ognjanović, V. Petrović, M. Korać and U. Midić.

Currently, data base contains 30 journals with more than 200 volumes, 3000 articles and 32000 pages. The presentations of the journals are dynamically generated from the database. Papers included in the data base could be searched (both in English and Serbian – by: authors' names, titles, titles of special sections within the journals, key words and words contained in abstracts), downloaded and printed.

The database and presentations were developed using Zope [20], an open source object-oriented environment for building web applications, under Linux operating system. Zope features a transactional object database, which can store not only content and custom data, but also dynamic HTML templates, scripts, a search engine, and relational database connections and code. One can use any Internet browser to read the presentation.

A part of the database and presentation contains almost 100 volumes of 5 mathematical journals published in Serbia:

1. Kragujevac Journal of Mathematics (4 volumes in English, 2000 -)
2. Matematički vesnik (22 volumes in English, 1993 -)
3. Nastava matematike (21 volumes in Serbian, 1992 -)
4. Publications de l'Institut Mathématique (42 volumes in English, 1980 -)
5. The teaching of mathematics (9 volumes in English, 1998 -)

The most recent project in this framework is called "Communication in Europe" [4]. Its aim is to make the database accessible in European alphabets and languages. A program package which enables translation of the interface and records was developed. It will be possible to enter in the data base the original or translated texts, abstracts, key words, titles, etc. in local languages and not only in Serbian and English. One of the expected long-term results of this project would be the standardization of domestic terminology and forming a thesaurus, including a comparative network of terms in European languages.

South-Eastern European Digitization Initiative (SEEDI)

The South-Eastern European Digitization Initiative (SEEDI) [17] is an effort to develop awareness about digitization of cultural and scientific heritage in the South-Eastern European countries along the Lund Principles of the European Union [11]. It is expected that it will contribute to gathering and spreading specific and interdisciplinary knowledge from various institutions from the region and the European Union where leading experts in the field work.

The SEEDI arose from the cooperation between researchers from Belgrade and Sofia (prof. Dr Milena Dobreva from the Institute of Mathematics and Informatics of the Bulgarian Academy of Sciences, prof. Dr Nikola Ikonov from Institute for Bulgarian Language of the Bulgarian Academy of Sciences) which was formally expressed in the Borovets declaration [1], a text concerning the future development of a network for digitization of scientific and cultural heritage in South-Eastern Europe which was formulated after the workshop "Digital Preservation of Cultural Heritage" [15] which was a part of the International Congress MASSEE'2003 [7]. In the declaration it was argued that »...[the researchers and the heritage institutions from the region] face common problems and share common scientific and cultural heritage. The knowledge and experience of single institutions from our countries should not stay isolated. It is of great importance to take measures for increase of the communication and exchange of technological expertise, standards and practical skills within the region, taking into account the experience of colleagues outside the region.«

It is well known that cultural and scientific heritage in our region is not widely available in electronic form. The idea of the SEEDI is to overcome that by bringing together researchers from regional and European centers having similar scientific and practical interest in digitization and to support cooperation between them. The aim is to create groups of specialists, which will be able to consult, assist, monitor and develop innovative technologies and digitization projects collaborating with the local heritage institutions.

The SEEDI would be implemented through several measures: conferences and workshops, the journal Review of the National Center for Digitization [10], the mailing list etc., to facilitate dissemination and sharing each other's ideas, concerns, views and experiences in the field. For example, the SEEDI-mailing list [18] is devoted to permanent communication between researchers involved in digitization of cultural and scientific heritage. It is planned that the First SEEDI Conference [19] will be held in Ohrid (Macedonia) under the name »Digital (Re-)Discovery Of Culture (Physicality Of Soul)« during the first week of September 2005 with the following topics: dance, music, playing (edutainment) and manuscripts.

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MALTESE EXPERIENCE WITH DIGITIZING CULTURAL HERITAGE

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***Abstract.** The article gives an account of the various microfilming initiatives taken in Malta during the last thirty years. Various archives have managed to microfilm their holdings under co-operation agreements with international societies, or manuscript libraries. The advent of digital technology is now posing new challenges and opportunities for the archives sector. The idea of a National Memory Project that will try to bridge the different approaches in the preservation of records in the various public, private, and ecclesiastical archives in Malta is discussed. Technical challenges are highlighted, as are the opportunities that arise from collaboration and active participation in international projects such as the European Visual Archives (EVA), and the SEEDI initiative.*

***Keywords.** Archives, Audio-Visual Archives, Cultural Heritage, Digitization, Malta, National Archives of Malta National Memory Project*

Introduction

Malta is a small island (450 km²) located in a very central position in the Mediterranean Sea. Its population does not exceed 400,000, yet its territory is very rich in cultural heritage. If one considers that no less than five pre-historic sites are situated within such a small territory, one appreciates the concentration of heritage on such a small island. These sites were declared world heritage sites by UNESCO. This paper does not attempt to delve into the diverse areas of cultural heritage, but restricts itself to archives. The perspective of this study is that of an archivist, greatly influenced by Malta's Euro-Mediterranean identity. It also brings in some of the experiences of a profession struggling to keep its identity in a country which formed part of the Commonwealth as from 1964, and the EU as from 1st May 2004.