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USE OF DIGITAL CULTURAL AND SCIENTIFIC CONTENT IN EDUCATION – A RESEARCH PROJECT UNDER THE “MEMORY OF SLOVAKIA” CENTRE OF EXCELLENCE

Abstract: The paper deals with a sub-project of the Memory of Slovakia research and development project focused on cultural heritage related to Slovakia and preserved in Slovak memory and heritage institutions, and its preservation and use by numerous types of users, especially in new contexts of digital media based education in primary and secondary schools of the Slovak Republic.

Key words: Digitisation, Cultural Heritage, Education.

1. Introduction

Rapid development of information and communication technology over the past decades made it possible to communicate quickly and efficiently, which also applies to learning. Classrooms are gradually taken over by digital media. In the meantime, traditional memory and heritage institutions have to face the digital future too. Users of the present day are getting used to instant access to content, which creates pressure on institutions to expose all their holdings in the digital form if they wish to survive. While users will be certainly happy to have access to digital content, one needs to find an answer to the questions how digitised cultural and scientific content may be used and for what purposes.

2. Digitisation and Europe

Digitisation of cultural, educational and scientific content is of paramount importance in the development of a society where information and knowledge are the major factors of production. Many countries all over the world recognise the significance of digitisation and include this issue in their political agendas. In case of the EU, it is the Digital Agenda ([1], 2010) which calls for increasing citizen's media and digital literacy with growing use of information and communication technologies. It is important for the development of information society and knowledge economy. The Agenda reaffirms on the European level the key role of information and communication technologies (ICT) and the internet and sets ambitious targets for digitization in general. The Agenda aims to maximise the social and economic potential of ICT and particularly the Internet as a live medium and means of economic and social activities in the field of business, work, entertainment, communication and self-realisation of people. The implementation of

this agenda is expected to be an incentive for innovation, economic growth, the development of quality of life and business. Specific benefits include for example better healthcare, better transportation, cleaner environment, new opportunities for media and easier access to public services and a new, universal access to cultural content. In Europe's cultural domain, member countries share a common vision of creating a unified multilingual portal Europeana.eu. The project of Europeana is co-financed by the European Commission and it is guaranteed by the Dutch Royal Library in The Hague and the European Digital Library Foundation. In 2010 the European Commission announced a requirement of 10 million objects in Europeana. The technological and organisational advantage developed for over a decade in a group of cooperation projects is the European Library (TEL - TheEuropeanLibrary.org), which is currently a well-maintained and functional service that provides uniform access to catalogues and collections of national libraries of Europe with value-added services. There are numerous EU-funded research or content-oriented projects in relation to digitisation, and a number of initiatives focused on legal issues associated with access and preservation of digital content.

3. Digitisation and Slovakia

There are 5 major digitisation projects to be implemented, which will be completed until 2015 under the Information Society Operational Programme (2007–2013) using EU Structural Funds. Besides the Digital Library and Archives, it is the Digital Gallery, the Digital Museum, Digital Monuments and Digital Audiovisual Heritage and associated infrastructures-oriented and on-demand project with a total budget of 217 million EUR ([2], 2011).

On the one hand, the Slovak Republic is in an advantageous position because of the fact that huge resources from the EU Struc-

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tural Funds are planned for the period 2007–2013 for digitisation under the Information Society programme, aimed also at creating the necessary technological infrastructure and produce critical mass of content. By 2013, the program will have created about 3.5 million digital objects, of which 2.8 million objects represent written (textual, documentary and archival) heritage. On the other hand, unfortunately, steps taken, or not taken, by Slovak executives have caused a severe delay, resulting in a situation that actually after one half of the programming period not one digitisation project has been started yet. Nevertheless, in the recent years, the Slovak National Library, a top-level national cultural heritage institution made progress in building a part of the infrastructure needed to implement the ambitious national project of digitisation practically complete Slovak and Slovakia-related written and printed heritage, consisting of books, newspapers, journals, manuscripts, maps, music, photos, postcards and other materials under a common strategy in coordination with other relevant state and self-government entities. The infrastructure includes digitising lines with an automated page-turning robots, mobile modular data centre, robotic tape library, disk arrays, servers and network technologies. These are the building blocks needed to create digital libraries for preserving and accessing content. The long-term vision is to establish an Integrated Competence Centre for conservation, preservation, digitisation and microfilming.

The mission of the “factory” that must be built with the participation of all stakeholders, is the production and long-term maintenance of digital content including creation, capturing, long-term preservation and retrieval, not only in the public domain, and providing these for re-use through portals and services for different purposes such as education, science, research and development, tourism etc. In short, users – from the learners to curious seniors, need quality content offered via quality services.

4. The Memory of Slovakia R&D Project

The Memory of Slovakia project – the National Centre of Excellence in Research, Preservation and Accessibility of Cultural and Scientific Heritage, project no. ITMS 26220120061, 2010–2013, University of Zilina, Faculty of Humanities, Slovak National Library in Martin. The strategic goal is to establish the National Centre of Excellence in Research, Preservation and Accessibility of Cultural and Scientific Heritage with internationally recognised basic research. The project’s budget is almost 4 million EUR ([3], 2010).

The project will contribute to improving the technical infrastructure of leading research institutes in the field of protection and access to cultural and scientific heritage in the Zilina Region, as the current level of technical infrastructure does not allow to implement a number of research activities at the appropriate level of quality, or does not allow to implement these activities at all. The project implementation will improve significantly the conditions of educational process and training new generations of researchers. In theory and practice, the project addresses research areas such as research on the history of book culture, research on the preservation and conservation techniques, and research on

usability of digital cultural and scientific content in education. One of the sub-projects of the Memory of Slovakia concentrates on the use of digital cultural and scientific content in primary- and secondary-level education. It will be well-furnished with various digitised contents which can be selected, processed and used in the educational processes. Under the Information Society Operational Programme, there are thousand of other media types to be prepared for use, from libraries, archives, galleries, museums and audiovisual organisations.

The particular sub-project specialises in a concept of a school digital library with the following objectives and activities:

- research and development of usability and accessibility of digital cultural and scientific content, especially in the field of education,
- designing solutions for the use of cultural and scientific (especially digital) heritage in education,
- research on user needs focused on specific group of learners and the identification of needs for development of tools of information retrieval, knowledge capture and learning,
- design, specification and development of a model for using cultural, scientific and intellectual heritage for educational purposes to be implemented at national level using the latest technologies,
- research, analysis, specification, determination of methodology for development and verification of a replicable model for the use of cultural, scientific and intellectual heritage for educational purposes for communication with potential stakeholders and their involvement in the project (i.e., content holders in the organizations of cultural and scientific heritage, state institutions in the field of culture, education, faculties of education, elementary and secondary schools, pupils, students, school librarians, teachers etc.),
- design of digital library-based education as a subset of the Slovak Digital Library, in the context of the European and global digital libraries and integration of schools, libraries, cultural, educational and other entities in Slovakia,
- developing the Centre of Excellence for digitisation of cultural heritage (the Slovak Digital Library), and further research on user needs, setting parameters of production, processing and publishing of digital content (metadata for the use of digital content in schools, search tools, controlled vocabularies, thesauri, classification, multilingual presentation and accessibility of digital content, legal aspects of access to digital content, the technological aspects of digital content, Web 2.0 technologies like blogs, Wikipedia, user-edited content on the web, tagging content, social tags, etc.) – in coordination with relevant initiatives and programs EU focused on research and development.

The relevant technologies examined, with those covered under the EU’s DIGICULT project ([4], 2004), include:

- systems for managing digital content – and long-term storage,
- mass digitisation of cultural and scientific heritage and their process (metadata, authenticity, access control),
- XML Technology Group, Topic Maps,
- Semantic Web – ontologies, taxonomies,
- systems for customer relationship management/users,

- smart labels and tags, radio-frequency identification systems,
- virtual reality technology and imaging,
- human interface, controls, keyboard, pointing devices, touch screens,
- game technologies,
- application service model,
- cultural agents and avatars,
- electronic programming guides and personalisation,
- mobile access to sources of information about culture,
- technologies for rights management and payments,
- mechanisms and technology for cooperation,
- visualization and 3D objects, virtual reality,
- navigation and context-sensitive applications,
- open source software and standards,
- natural language processing,
- information retrieval (searching),
- knowledge mining,
- positioning and navigation systems,
- data visualization,
- telepresence,
- haptics, robotics.

In particular, digitised content from the memory and heritage institutions is potentially usable in subjects like languages and literature, history, arts, not to mention vast possibilities of complementing classes of sciences with disparate learning materials.

The actual research under the Memory of Slovakia project will be carried out by external staff implementing activities upon prior arrangements with the partners involved. Researchers will examine the feedback of teachers and build a “digital classroom” where pupils or students can use various hardware and software technologies, interfaces for interaction in the learning process. Further milestones and expected results include raising awareness and education among the essential stakeholders concerning the possibilities offered by

digital technologies used to access and re-use cultural heritage and knowledge. In general, the initiative is aimed at preparing pupils in primary schools and students in secondary schools for consolidation and utilisation of information and knowledge for analytical and critical thinking, independent or group research, collaboration and other skills useful for university studies, scientific research and development activities and further lifelong learning.

The project’s results and recommendations will be practically implemented in the production of the Slovak Digital Library, the experience and knowledge generated will be used in the learning process (library, teaching, and other relevant departments in universities)

The deliverables under the digital library project include a usable and verified application service extension of the Slovak Digital Library, with a positive impact on advancements in processing and providing access to digital content. The project benefits are also represented in new knowledge to be exploited in education and further research and development in the field of digital cultural and scientific content.

5. Conclusion

The user-centred design of the School Digital Library as one of the outcomes of the Memory of Slovakia research and development project will be a complement to the ongoing initiatives in digital education. There are enormous volumes of knowledge left by our predecessors which can be examined, analysed and reused when necessary in many use scenarios, and education is one of the most important ones. The task for researchers in the Memory of Slovakia is to explore the ways of utilising the unique digital cultural and scientific heritage and justify the resources spent on its production and maintenance.

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