

**Nevena Ackovska, Mile Jovanov,
Marija Mihova, Smile Markovski**
(Institute of Informatics,
Faculty of Natural Sciences and Mathematics,
Skopje, Macedonia)

ACHIEVEMENTS AND RESULTS OF CENTER FOR DIGITIZATION OF THE NATIONAL HERITAGE OF MACEDONIA

Abstract: We present the results of the educational and production role of the Center for Digitization of National Heritage (CDNH). Also, we present the achievements in the global e-culture processes in the Republic of Macedonia. CDNH acts as a bridge between the cultural institutions in Macedonia and the students and staff at the Institute of Informatics. The continuation of this cooperation shows that the presented approach is highly motivating for the students. As a result, the Portal of CDNH received one of the most prestigious awards as the best e-content and creativity project.

Key words: digitization, CDNH Macedonia, education, educational motivation, e-content award

1. Introduction

The reports of Internet penetration in Macedonia until 2000 were extremely alarming: only 5% of the population was using Internet at work or at home. The situation was slowly improving, but until 2005 the Internet content coming from Macedonian community was represented through web sites of scientific institutions, some of the government institutions and mostly entertainment.

The culture institutions in Macedonia were scarcely represented on digital media or on the Internet itself. Due to the small amount of web sites and other digitized media in Macedonia concerning national heritage, Macedonian citizens were not used to search for that kind of material on web. Hence, cultural institutions were not stimulated to digitize and present their activities on Internet.

The situation mentioned above was the most important reason for creating the Center for Digitization of National Heritage (CDNH) at the Institute of Informatics. CDNH was officially opened on March 1, 2005. CDNH activities are focused toward development of a digitized presentation of the national heritage of Macedonia via the following activities: building a web portal of the CDNH [1], producing application programs and programming tools for national heritage presentation [2, 3], organizing seminars, workshops and conferences [4], involving new teaching materials in students' education at Institute of Informatics [5], etc.

2. Digitization of National Heritage

The Digitization of national heritage is a process concerning several aspects. One very important aspect is the digital presentation of the cultural heritage elements. When using digital presentation, in order to complete the goal, one needs to use different multimedia technologies. Part of these technologies include sound processing and generating, creating and processing of photos, generating, processing and producing of videos, creating 3D visualizations and animations, as well as their integration in a final product, in order to achieve appropriate presentation and means of easy distribution.

These technologies, which are extremely important for the digital presentation of the national heritage, can be learned in the most of the Multimedia courses included in the Information technologies or Computer Science studies.

3. Syllabus of Multimedia course

Tutorials of the Multimedia course [5] organized at Institute of Informatics, at the Faculty of Natural Sciences and Mathematics in Skopje, Macedonia, consists of four main parts:

- 2D Graphics
- 3D Graphics
- Sound
- Macromedia Flash

Software products for raster as well as vector graphics processing and generating are included in the part 2D Graphics of the Multimedia course. The software product "GIMP" is studied in order to utilize its usage in raster graphics processing. The students were taught to work with the software product CorelDRAW as vector graphic editor.

The part of this course that covers the 3D graphics gives the students opportunity to study the software product Maya which offers enormous opportunities for 3D modeling and animation. The software product "VirtualDub" as tool for video capture and linear processing was also introduced.

The part of the course where Sound is thought includes 3 parts: "Audacity" - software product for sound processing, "Anvil Studio" as software for sound generation, and MIDI programming.

The fourth part of the Multimedia Practicum studies the software package Macromedia Flash and Action Script as part of it, as an integrative tool which enables production of dynamic, web oriented contents. Additional efforts were made to demonstrate the students its feasibility in web page editing, and panorama making.

4. The bridge between the education and the cultural institutions

The digital presentation of the national heritage of one country incorporates the usage of the previously mentioned technologies. This enables the students to apply their knowledge of multimedia technologies in generating projects in this particularly modern and very attractive area. The projects include presentations of very important segments of Macedonian national heritage. They were created as part of collaboration between the Center of digitization of National Heritage of Macedonia (CDNH) at the Institute of Informatics, and the students taking the Multimedia course. The role of CDNH is to communicate with the relevant institutions involved in the conservation of Macedonian national heritage, to understand the needs of

these institutions, to prepare action plan for the forthcoming activities and projects, and to complete those projects. These activities include the creation of various digital presentations, their integration in web pages for Internet presentations and as part of CD presentations. On the other hand, CDNH in the collaboration with the management of the Multimedia course obtains great number of digitized content ready to use for other impending projects.

5. The CDNH Portal

Most of the digitized material concerning the national and cultural heritage produced by CDNH and the students taking the Multimedia course is presented on the CDNH Portal (www.cdnh.edu.mk), shown on Fig.1. Therefore we could claim that the Portal of CDNH represents a collection of multimedia presentations of the Macedonian National Heritage. Many artefacts of the Macedonian cultural and national heritage, such as well known monuments, people and events, are presented in this Portal. The tradition, the customs, the music and the folk dances, the natural beauties of Macedonia, historically important people, sacred object and archaeological sites are digitized and available for exploration to the Macedonian and the foreign community.



Fig. 1. CDNH Portal - list of projects

Prominent examples of Macedonian cultural, national and natural heritage that are digitally presented in the Portal of CDNH are:

- One of the oldest megalithic observatories in the World - Kokino; (Fig. 2) <http://www.cdnh.edu.mk/Proekti/multimedija2007/kokino/pocetna.html>
- archaeology of the Macedonian empire – Vardarski Rid; <http://www.cdnh.edu.mk/Proekti/multimedija2007/vardarskirid/intro.html>
- Roman empire – cities like Heraklea, http://www.cdnh.edu.mk/Proekti/multimedija_06/Heraklea/index.html Stobi, (Fig 3) <http://www.cdnh.edu.mk/Proekti/multimedija2007/stobi/intro.htm>
- Bargala, <http://www.cdnh.edu.mk/Proekti/multimedija2007/stip/index.html>
- many churches and monasteries from the Byzantium period
- Churches and Monasteries of Matka (Fig. 5, Fig. 6) <http://www.cdnh.edu.mk/Proekti/multimedija2007/crkvimatka/matka.html>

- St Joakim Osogovski
<http://www.cdnh.edu.mk/Proekti/multimedija2007/joakimosogovski/Index.html>
- Gallery of icons
<http://www.cdnh.edu.mk/Proekti/multimedija2007/galerijaikoni/default.htm>



Fig. 2. Gallery of the one of the oldest megalithic observatories in the World - Kokino

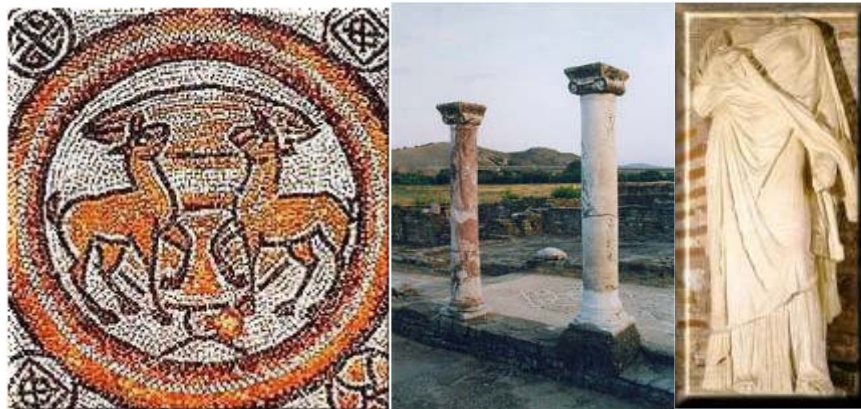


Fig. 3. Stobi

- the creators of the first Slavic alphabet – St. Cyril and St. Methodius
<http://www.cdnh.edu.mk/Proekti/multimedija2007/kirilmetodij/index.html>
- the founders of the first University in the world – St. Kliment and St. Naum of Ohrid, who also created the Cyrillic, the alphabet of the Slavic nations.
<http://www.cdnh.edu.mk/Proekti/ostanati2007/klimentnaum/default.htm>
- Macedonian folk, dances, songs garb, instruments (Fig 4)
<http://www.cdnh.edu.mk/Proekti/multimedija2007/makedonskiora/default.htm>
http://www.cdnh.edu.mk/Proekti/multimedija_06/ansambl%20Orce%20Nikolov/default.html
http://www.cdnh.edu.mk/Proekti/diplomski/Narodni%20Nosii/index_main.htm

The digitized materials included in the Portal of CDNH are incorporated in separate Projects based on principles of locality or homogeneousness. Any of the Projects could be accessed through the list of the Projects (Fig 1). The Portal of CDNH offers the additional functionality of searching for the digitized materials through categorized search. The categories offered on the Portal of CDNH are: Architecture, Archaeology, History, Multimedia, Ethnology, Culture, Geography, Religion, Literature and Museums.



Fig. 4. Macedonian folk dance

A significant number of the contemporary IT techniques, that are state of the art in the presentation of the national heritage in the world today, are included in the portal of CDNH. Many of the Projects in the CDNH portal integrate galleries, video presentations, 3D models, animations and panoramas (Fig 4 and Fig.5).

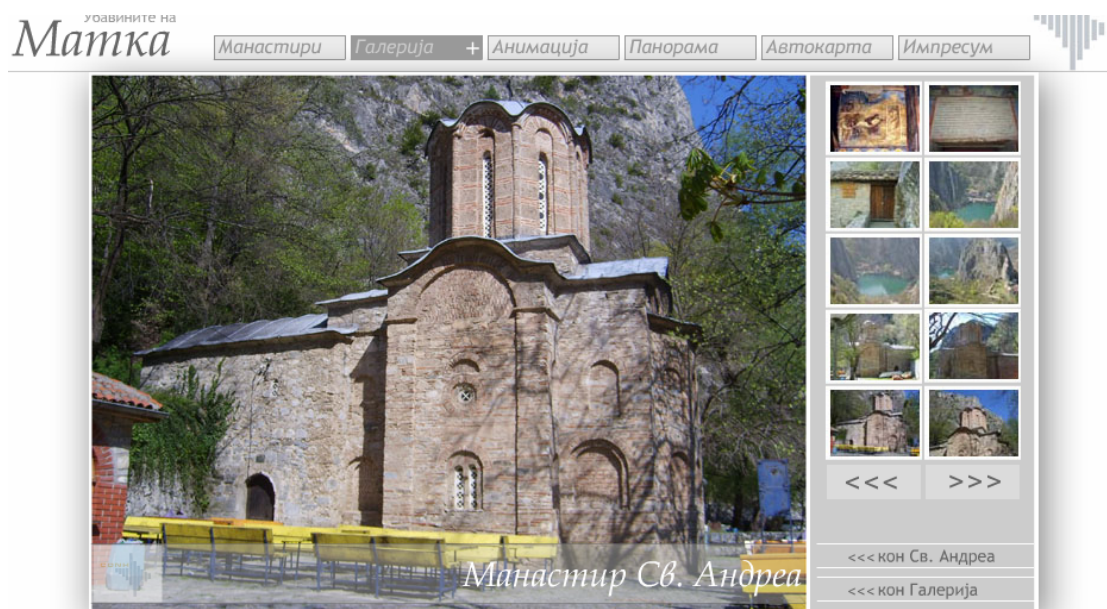


Fig. 5. Gallery of the monastery St. Andrea in the area of Matka Lake

As mentioned before, the basic idea for the creation of the Portal of CDNH was to bridge the digital gap that was present in Macedonia, and offer the users to find attractive and easy to use digital content. The solution of this problem was seen through rapid and massive

production of digitized content and mobilization of large number of people working in the field of digital presentation. Therefore, the Portal itself is built up of many individual projects about different nationally important artefacts and people.

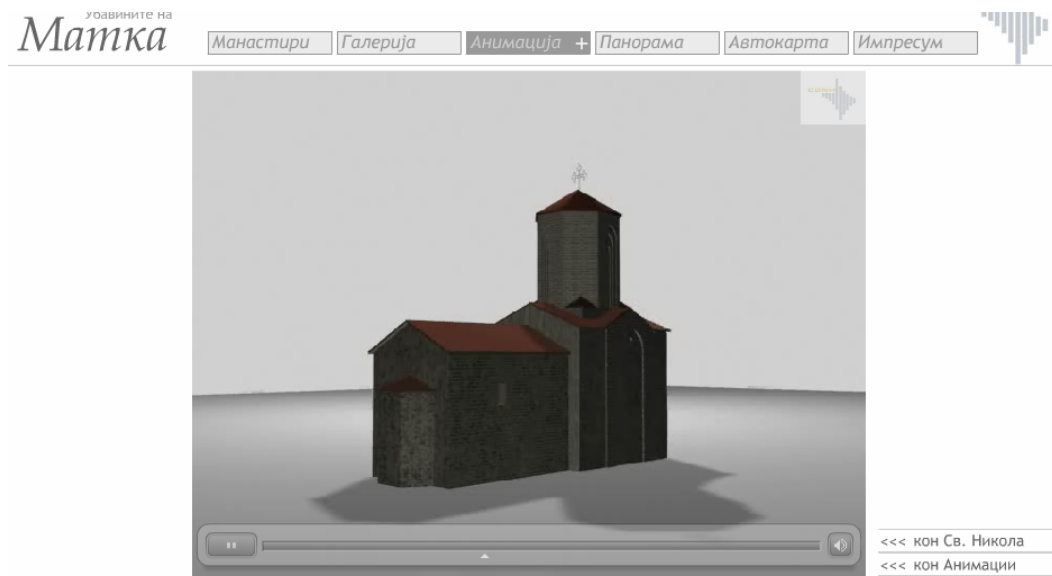


Fig.6. 3D animation of the monastery St. Nikola in the area of Matka Lake

6. WSA Competition

The World Summit Award [6] is a biannual competition of e-society in 6 different categories: e-government, e-health, e-science, e-learning, e-culture, e-entertainment, e-business and e-inclusion. The World Summit Award (WSA) is a global initiative to select and promote the world's best e-Content, started in 2003 in the framework of the United Nations' World Summit on the Information Society (WSIS). This is done through national contests, a global contest, held every 2 years, and numerous content-focused national and international conferences and workshops – the WSA Road Show.

The CDNH Portal was competing and won in the category of e-culture in the national WSA competition [7].

7. Results

The strategy we use in teaching Multimedia course enables the students to create part of the projects that are incorporated in the official digital presentation of the national heritage of Republic of Macedonia. The idea that their work is presented to broader Macedonian community motivates them to achieve their maximal potentials, both in qualitative as well as in the quantitative aspect of the project creation. Also, these types of projects give the students opportunity to feel the real team spirit, field project qualities and problems, managing the time and resources, and communication with authorities and people from the cultural and historical community of the Republic of Macedonia. This approach, also, enabled rapid production of digitized material that is included in the CDNH Portal.

Due to the availability of large amount of digitized material, there is a growing interest for the CDNH Portal itself. Additionally, many of the localities that represent archaeological, historical and natural beauties, presented in the Portal are becoming more interesting for tour-

ists, students and researchers. There is also growing interest for the Macedonian culture, history and literature.

With the growing number of Projects represented on the Portal of CDNH, many of the cultural institutions as well as the municipalities find their interest in presenting their activities and historical and cultural aspects of their work. Therefore, this web Portal contributes in the increase of the number of Internet users and the quantity of the digitized media.

The most important result achieved so far was the first prize at the WSA national competition in the category of e-culture.

8. Conclusion

The digital presentation of national heritage offers enormous opportunities in application of the students' skills acquired in the course of Multimedia. It is evident that due to the fact that these projects are available to broader public through their web accessibility, the students are highly motivated to create interesting presentations. The motivation itself leads the students to global understanding of the multimedia technologies and a desire to master all of the software products taught in the Multimedia course.

The student motivation enables rapid and massive production of digitized media that is presented on CDNH Portal. The newly produced material implied interest towards the CDNH portal of the cultural, scientific and other government and non-government institutions. Therefore, these institutions are more eager to represent their work publicly on the CDNH Portal and on the World Wide Web in general.

The concept of the Portal, its rapid production, enabled it to be the best contender on the WSA national competition in the e-culture category. We hope that results of this kind will make the cultural institutions in Macedonia even more aware of the need and the use to collaborate with CDNH.

Acknowledgements. The authors wish to thank Nikola Lazovski, Goran Kolevski, Marjan Kindalov and Nikolche Mihajlovski for their effort in producing valuable teaching materials for Multimedia course. This research was supported by Center for Digitization of National Heritage of Macedonia at Institute of Informatics, FSNM, Skopje, Macedonia.

References

- [1] S. Markovski, G. Armenski, P. Miloshev, N. Mihajlovski, web portal of the CDNH Macedonia, www.cdnh.edu.mk
- [2] M. Jovanov, M. Kindalov, G. Kolevski, P. Miloshev, N. Mihajlovski. *System for storing data about national heritage with advanced search techniques*, Review of NCD 9 (2006).
- [3] N. Ackovska, M. Jovanov, D. Aleksovski, V. Atanasov, B. Endrovski „Software for digitization of ancient Slavic glagolic handwritten manuscripts“, *Book of extended abstracts*, ISBN 9989-668-46-9
- [4] N. Ackovska, official site of the First SEEDI Conference, www.ii.edu.mk/SEEDI2005/
- [5] M. Jovanov, S. Markovski, Web page of the course Multimedia, Мултимедија 2006/2007 at courses.ii.edu.mk
- [6] World Summit award, The best in e-Content and Creativity <http://www.wsis-award.org/>
- [7] Награда на Светскиот самит за информатичко општество - Македонија 2007 (Best Project in e-culture category of the WSA Macedonia Competition), http://wsa.org.mk/index.php?option=com_content&task=view&id=74&Itemid=58