

Development of the technological tools for support of musical e-culture

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Abstract—The article describes the technological tools used at the development of an informational portal for musicologists, musicians and music fans on the musical culture in the Republic of Moldova. The portal is developed using Drupal. The technique is described to integrate in the system multimedia open source editors.

Index Terms—cultural heritage, e-culture, multimedia portal technologies, musical heritage

I. INTRODUCTION

The European Union grants significant attention for adoption of information technologies to the activity of public cultural units that facilitates the systematization, studying, keeping, and popularization of the European cultural heritage [1,2].

The social and cultural role of multimedia increases in our informational century. It is the century of the digital Renaissance that brings to the people knowledge as a new resource. Multimedia has a developing and creative potential that permits to find diverse and effective forms and techniques for self-realization.

In modern conditions as information technologies cover all spheres of life, culture and art also address to the services of modern technologies. Therefore multimedia can be enlisted between the tools used in the domain of culture.

One of directions of multimedia as culture phenomenon is digitalization of the cultural heritage, which is actively and purposefully developed today by many countries and by the international community, in particular, under the aegis of UNESCO.

Information technologies give the chance to open to the world the complete cultural heritage of many generations, provide access of the whole Internet community to each document from archives, each museum showpiece, each monument of architecture, history and culture.

According to priority of questions discussed at the summit of the Council of Europe in Strasbourg, the special project named “New information technologies” has been executed. Its purpose was “to develop a European policy for the application

of the new information technologies, with a view to ensuring respect for human rights and cultural diversity, fostering freedom of expression and information and maximizing the educational and cultural potential of these technologies”. More projects followed this one.

There is a culture of new type, the electronic culture consisting of several parts, i.e., the electronic versions of the cultural heritage objects in the fine arts (painting, drawing, sculpture), performance arts (music, theater, dance, etc.), the immovable cultural heritage (architecture, cultural landscape), cinema, and TV. The technique of cultural heritage reduction to the electronic form consists of two parts, digitalization and creation of control systems for electronic cultural resources.

The forthcoming of the information society as such broached the question of accessibility of cultural objects, especially to use them in educational process and research. One of the first steps solving this problem during the creation of the informational society in Moldova is to grant access to the cultural heritage by information technologies. According to this aim we propose to develop a musical information portal, which will publicly provide the adequate information in the field of musical culture for both experts-musicians, and fans of music. It is necessary to note that use of modern communication tools remains uneasy for the majority of non-specialists in computer science. Therefore the problem of creation of the portal includes not only multimedia access to musical editions, manuscripts and soundtracks through the uniform search interface but also problem oriented tools of support for content updating.

Therefore there is a necessity to create simple but multi-purpose tools that would allow to create and to support the musical Web portal. This toolkit should have the following features: it should be based on open source programs; it should give the intuitive interface for portal administration; it should be intuitively clear for experts in problem area (musical art) that will administer the portal content, i.e., add, modify, and delete the multimedia information (text, pictures, audio, video), performing the portal maintenance. We do not describe the stage of digitalization preceding that of the site population by its content.

II. REQUIREMENTS FOR THE PORTAL

Musical portals were the first that appeared in the Internet owing to enthusiastic fans. The domain music.com contains now a commercial multimedia portal. We have in Moldova

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several musical information sites: www.music.md, www.rupere.md, www.metal.md, old.ournet.md/~ultra, www.romanfolk.narod.ru, www.iatp.md/moldmusicpress etc.

Regrettably, they provide only a fragmentary and non-systematic picture of the corresponding domain, and they do not provide tools adapted for using by non-informaticians.

Our approach is centered on the necessity of implementation of a simple, clear, and multifunctional toolkit that permits the creation and support of a Web portal on the musical art in Moldova. The toolkit is based on the open sources, contains an intuitive and clear interface to administrate the Web portal, and permits its usage by the specialists in music. Musicians and musicologists will manage the content: add, modify, delete, etc. multimedia information (text, graphic, audio, video).

The system is projected keeping in the perspective to become the base for an informational consulting network. It should include the national-wide information on all persons and institutions in the musical art.

The qualities of a good Web site are as follows.

The site should be transparent, i.e., it should clearly show its destination, purposes, and governing institution. It is necessary to select, digitalize, present, and estimate its content from the point of its effectiveness for its visitors. The site should correspond its policy of service guaranteeing its support and actualization. The site should be accessible for all visitors independent of their physical restrictions or of the used technologies including navigation, content and interactive elements. The site should be visitor-friendly taking into account their needs, providing them actuality and simplicity of work, and considering their appraisal and feedback. The site should be reactive, i.e., permit visitors to contact and to get an adequate answer. If necessary, the site should stimulate the visitors to pose questions, to exchange information and to hold discussion with other visitors. The site should provide multi-language access to the information. The site should be compatible with other cultural Web sites.

The site, which is considered as supported one should satisfy a number of criteria. Degree of support and actualization corresponds to the number of criteria to which the site satisfies. So, it is possible to say that the site is supported on 75% if it does not satisfy all criteria. Criteria of the site support are as follows:

- removal of the information on the past conferences, meetings, and other similar data;
- removal or archiving of news at their obsolescence;
- maintenance of the actualized state of blogs and reports;
- absence of unexpectedly breaking reports;
- smooth termination of blogs and reports upon the termination of the corresponding activities;
- regular check of the whole content and its updating at necessity;
- periodic analyze of need in the “face lifting” changing the shape of the site;
- implementation of the maintenance policy;
- accepted and tested procedures of backup copying;

- service and maintenance by existing technological and program systems.

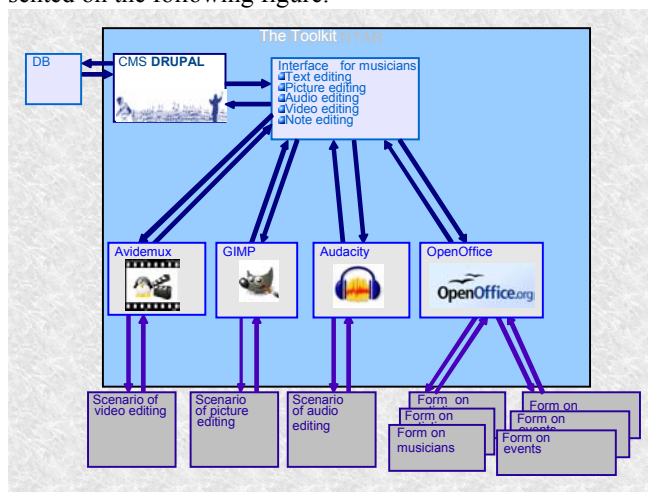
The informational portal [3] should be organized as follows.

The visualization engine should support multimedia elements. It means that the end user should not install special programs to process such information. We chose the Web browser as the engine. This program is available on each computer and possesses all necessary properties. The information will be presented as the site content.

The dynamic character of the represented information imposes necessity of dynamic content updating, and the specific character of the content assumes its updating by a group of non-specialists in information technologies.

III. THE TOOLKIT STRUCTURE

At the toolkit implementation we took into consideration the fact that the portal content authors and its administrators should not only possess the usual universal content management system but tools to process multimedia with a user-friendly interface. The general scheme of the toolkit is presented on the following figure.



Taking into consideration the site specific, we need editors for audio, video, graphics, and text. The corresponding editors were selected from the open source ones because we do not want extra pays for the software. In any case, these components should permit usage by musicians and not IT specialists.

The minimal necessary operations for audio files are concatenation, erasing of parts, other elementary processing, saving in a free format. The effected investigations permitted us to select the program Audacity as satisfactory for our needs.

The minimal necessary operations for video files are the same: concatenation, erasing of parts, other elementary processing, saving in a free format. After investigations, we selected the program Avidemux.

We will use the HTML format and the corresponding editors for the presentation of comments to musical works, rhymes, biographies, historic essays, etc.

To present notes, we will use XML-based and Java-based components.

We selected an open source graphic editor Gimp that will be used for operations over the pictures included in the Web pages.

IV. THE INTERFACE STRUCTURE

The toolkit menu should be dynamic. Opening of a file of some type (audio, video, etc.) changes submenus for editing, converting, saving, processing, etc. in correspondence with possibilities of selected programs and utilities for this file type. As we open several files of different types, the dynamic reconfiguration of menu is executed at the focus movement between windows. The help system is also accommodating dynamically to the type of the actually processed file. As a result, the information preparation for the site is reduced to the form filling: textual is some sequence, graphic, audio, and video. The editing is performed by non-informaticians, therefore, the tools are implementing as wizards working in step-by-step mode. Each wizard page contains standard navigation buttons *Back*, *Forward*, *Cancel*, and *Finish* instead of *Forward* in the last page. The buttons implicit actions are schematically described below.

When the toolkit is started a window is opened providing selection of the working mode: *Text Editing*, *Picture Editing*, *Audio Editing*, *Video Editing*, *Note Editing*, *File Conversion*, and *Search*.

If the *Text Editing* mode is selected, the following possibilities are proposed to the user: *News*, *Events*, *Musical Encyclopedia*, *Publications*, *Musical Institutions*, and *Personalities*.

The page visual presentation is defined by the style sheet.

If the user selects *News*, the next step is the selection of a record from the drop-down menu. A record can be visualized, edited, saved using the form. The filled form is opened at operations with the existing record. If the user selects the new record creation, the empty form is opened for filling.

The news editing form contains the following fields: date, time, and the record text. There are additional buttons *Show the Record on the Site* and *Delete the Record from the Site*. Each record can include some media content. We provide for it buttons: *Add Photo*, *Add Audio*, *Add Video*, *Add Notes*. If we have several elements of a type, they are listed in a drop-down list with possibilities to preview, edit, and delete them from the site.

If a personality page is selected for editing, we select a person from a list of names. Then we see a form with fields: *Biography*, *Creations*, *Activity*, *Awards*, *Bibliography*. The form can be opened, edited, saved, shown on the site.

If the text is new, the empty form is shown. If the user opens the existent text from the site, the form is shown filled or partially filled depending on its precedent (saved) state. The form can be filled, or its filled elements can be edited.

As to photos, videos, audios and notes, these files are created from zero using professional tools that are not included with our system. Our toolkit permits only editing of existing files. That's why forms for these file types consist of the preview window, the *Open* and *Save* buttons and the editing but-

tons described below. The *Show on the Site* button is present in the form for all file types, both for text and multimedia.

To edit pictures (photos) we use an open source graphical editor GIMP. This editor is very powerful, and non-specialist in informatics probably will not use all its features. When the editor is called from the toolkit shell its menu is restricted by the following operations: *Crop*, *Color Balance*, *Brightness*, *Contrast*, *Red Eyes*, *Flip*, *Insert Picture*.

To edit audio we use an open source editor Audacity. When the editor is called from the toolkit shell its menu is restricted by the following operations: *Concatenate Files*, *Delete Fragment*, *Convert*, *Listen*, *Add Audio*.

To edit video we use an open source editor Avidemux. When the editor is called from the toolkit shell its menu is restricted by the following operations: *Concatenate Files*, *Delete Fragment*, *Convert*, *View*, *Add Video*.

V. CONCLUSION

In the paper the technology is described used at the creation of an information portal on musical art. The toolkit described in article is intended to be used from the Web site by persons having corresponding access rights. It is obviously meaningless to grant non-specialists the whole set of features of multimedia editors, and their menu is limited to the minimal set of necessary operations. Our approach allows integrating open source systems of multimedia content processing into the content management system Drupal. The developed tools can be also adapted for other kind of art.

REFERENCES

- [1] *European Cultural Convention* (ETS No.18) (1982), ISBN 92-871-0074-8
- [2] F.G. Filip, Igor Cojocaru, "Information technology and valorization of the cultural heritage". <http://www.asm.md/administrator/fisiere/science/Presentations/III.08.Filip.p.pdf>
- [3] S. Cojocaru, A. Colesnicov, V. Demidova, L. Malahova, L. Burteva, M. Petic, „Instrumentar multimedia pentru facilitarea promovării artei muzicale”, *Studia Universitatis*, seria “Ştiinţe exacte şi economice”, Nr.3 (13), 2008, Chişinău, Moldova, p.82-85.