Coins from the Burgas Bay: Creation of a New Digital Numismatic Content in the Internet Representing the Economic and Cultural Development of Burgas Region from Ancient Times to the Present Days

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Abstract. Coin Collection of Regional Historical Museum – Burgas /RHM-Burgas/ is one of the oldest and most complete in Bulgaria. This paper describes a project framework for building a virtual collection titled "Coins of the Burgas Bay" considered as a collection from digital objects presented in an interactive environment, rendered in a web browser. Using that environment, the virtual visitor can examine a given digital object inspecting it in detail. This article presents the conceptual model for the digital presentation and annotation of this unique numismatic content aiming to ensure the presentation of the content to the worldwide dispersed audience as well as to promote scientific research activities in the connected science domains.

Keywords: Virtual Museum Collections, Digital Numismatic Content Management, Digital Libraries, Web Access.

1 Introduction

The project proposal for creation of a digital numismatic exposition "Coins from the Burgas Bay" from the collection of Regional Historical Museum Burgas (RHM-Burgas), aims to document, catalogue and store the cultural heritage of Burgas region using modern technologies. The prime objective is to preserve the cultural heritage while facilitating access to it for scientists from Bulgaria and the entire world, as well as for anyone who would like to learn about the economic and cultural relations of Burgas region from ancient times to the present day. The main project aims are planned to be fulfilled in close collaboration among experts from RHM-Burgas and specialists from Institute of Mathematics and Informatics, Bulgarian Academy of Sciences (IMI-BAS) during a period of 18 months.

The presentation of the Bulgarian cultural heritage in digital form will contribute the European context of cultural exchange, enabling the exploration and popularization of Bulgarian history and culture as part of the European, while highlighting their

own uniqueness and importance. The Bay of Burgas is a meeting point for people of different ethnicities, religions and professional backgrounds, whose social relations can be traced best through the means of exchange that they used.

The digitalization of the numismatic collection of RHM-Burgas will provide maximum accessibility at a global level; it will facilitate and enhance traceability, analysis and research on economics, trade and cultural relations of the region during different historical periods.

2 Rationale - Problems, Limitations in the Subject Area, Needs

At present the majority of cultural and historical heritage kept in the museum collections in Bulgaria, is catalogued mainly in paper inventory books. The information from them is not available digitally and neither are there images of the objects.

Access: Due to its nature, the unique numismatic collection of RHM-Burgas has never been publicly exhibited. Displaying it in the museum is currently impossible, because there are no proper window cases, lighting and opportunities for its maximum availability and presentation to the visitor.

Limitation: Displaying the coin collection in a static form, behind the old museum glasses can hardly impress the casual visitor who has no specific knowledge in history and archaeology. Due to the limitation of the physical space in the museum it is difficult to separate a large area for a detailed display of objects and provision of sufficient information about each of the objects, as well as presentation of information at different levels and languages.

Study: Due to the fact that this collection has never been displayed, it is not popular and the existence of many of the objects is unknown even to the majority of scholars. The exhibits of pre-coin forms are particularly interesting, and the presence of almost all their types in the collection of RHM-Burgas, could intrigue scientists and enthusiasts from all over the world. So far, the studies of coin emissions from the Ottoman rule in Bulgaria are extremely limited. Another less known fact is the presence of large numbers of coins from the Western countries in the Burgas Bay and their relation to the history of trade in the Black Sea during the centuries when the sea was used only by the subjects of the Ottoman Empire.

Complexity: The digitalization of objects of cultural and historical heritage, which are to be presented to a wide audience with diverse interests, needs and preferences, is a difficult and complex process. The implementation requires prior consultation with experts in conservation and restoration on the probability of side effects on the museum objects, which may arise in the process of digitalization and the possibilities for their neutralization. The employed specialists for digitalization and presentation of the digital numismatic collection must have deep knowledge of the objects as well as have the appropriate digital and technical competencies. This process requires the people engaged in this activity to undergo training by specialists in the field of museology and archaeology and information technology training to work with the equipment and software developed.

3 Target Groups

1. Scientists and researchers, PhD students. Information they request from the museum, is very specific. Due to the lack of digital information on the exhibits, the museum is unable to provide the requested information. This hampers research, and sometimes causes the exhibits from the region to be excluded from studies (e.g. when scientists from abroad are not able to visit the museum to conduct their research on place).

2. Students and teachers who wish to deepen their knowledge on the subjects covered by the collections of the museums in Burgas.

3. Any citizens (Bulgarian and foreign) with an interest in history, culture and art.

4. Disadvantaged citizens. These are people with physical disabilities, some of which have very limited access to museum exhibitions.

5. Tourist companies. They need information in a digital form which they can use to develop their service packages. Often it is impossible for the museum to pro-vide this information, as the exhibits are not digitalized.

4 Impact

The only opportunity for popularization – The digitalization of the collection "Coins from the Burgas Bay" and assuring the fast and easy access to it in digital space would give the possibility for its exploration, popularization and interpretation. One of the most important requirements to achieve this goal is the formation of a strong partnership among the experts in different areas such as Cultural Heritage and Information and Communication Technologies (which usually have not too many common points of research and interests). The successful fulfilment of such a kind of project would allow the combining of their competences for the creation of a high quality product with both scientific and popular value. The project's results shall generate a sustainable base for future research activities and visualization of the economic and cultural history of the region. The development of the digital system with possibilities for continuous adding of new content and information will assure the enhancement and enrichment of the database with the results gained through the research activities initiated with the use of the system by members of the target groups described above.

To create such a digital system, RHM-Burgas would meet challenges, difficulties and requirements in finding the essential means and experts on its own. The collaboration activities within the project with the leading experts and scientists from the IMI-BAS working in the IT domain would offer a unique chance for the implementation of such initiative.

Scientists and researchers often meet the problem of total lack of information or the inability to access the information about the exhibits stored in the Bulgarian museums. This problem is often a result of the way these museum collections have been kept in the specific expositions. In many cases the information is totally unusable and inaccessible. This is a significant obstacle for the scientific researches and sometimes

it may cause the exclusion of many unique exhibits from studies (for example when the scientist is a foreigner and has no opportunity of visiting the museum in order to conduct their own research on place).

Students, pupils, teachers and lecturers hardly find time and other resources as well as motivation to visit the museums and to learn more about the collections' exhibits. One of the reasons is the incompatibility of the presented information inside the museum expositions to meet the requirements of the new information society. The provision of easy access and availability of digital information about historical and cultural heritage of the region would help raise the interest of students. The appropriate illustration of the information presented in the museum annotations, which is now hardly understandable for students, and the development of an attractive and adaptive virtual learning content would be a guaranty for the quality of education and training improvement.

Not all citizens interested in history, culture and numismatics have the possibilities to visit the RHM-Burgas. For the majority of visitors the time spent in the museum is limited for different reasons. The digital collection "Coins from the Burgas Bay" would allow the visitors to go back to it in order to learn something more and new or to take a look at what they have missed, without the restrictions of time and space.

Another problem is the inability to provide enough information about the ex-hibits in different languages which discriminates and restricts the foreign visitors. By means offered naturally by the digital exposition, they would be able to find easily and transform the available information into understandable form.

The implementation of this project would provide new and modern conditions for the broad access to the expositions of RHM - Burgas to a wide range of experts, users, and people interested in these areas. Access to the exhibits, which have not been included in museum's expositions for different reasons, could be provided to the audience in an effective way.

The creation of easily accessible, well adapted and visualized information in-stead of the actual boring and strictly scientific texts would increase the overall interest to the museum and to the history of the region by students and pupils as well as by citizens and tourists without previous knowledge on this domain. The use of new technologies impresses mostly the young people and quickly attracts their attention, making them willing to discover something new. By learning more about the history and the variety of cultures, which occupied the lands surrounding Burgas Bay from ancient times till nowadays, the young people will gain self-esteem of descendants of an ancient culture as well as they would also develop sense of understanding and tolerance towards the different ethnical groups and religions.

The presentation of the Bulgarian historical and cultural heritage in digital form would contribute to the European context of cultural exchange and at the same time it would define the uniqueness of the Bulgarian historical and cultural heritage, allowing its study and popularization as a part of the European and world history and culture.

The inclusion of the coin collection in the digital exposition would become an important link for tracking, analysis, and exploration of the regional economic and cultural relations through the different historical ages.

The Bay of Burgas is a meeting point of people from different ethnical groups, religions and professional groups, whose relations could be studied at best trough the means of exchange they had used. At the same time the results of the current studies on the history of the region are very limited and extremely controversial, which is most likely an aftereffect of the hardly accessible and uncompiled information. The implementation of the project would contribute to the integration of research activities, their promotion, integration and easy update.

5 Expected Results

The expected results of the project "Coins from the Burgas Bay" could be summarized as follows:

- **Facilitating the access to the museum and to the artifacts from the museum collection.** The project implementation will create new and modern conditions for the broad and flexible access to the numismatic exposition of RHM - Burgas.
- **Enrichment of the digital content in the cultural heritage domain represented on the Internet** with the possibility of visualization and adaptation to the needs, interests, and preferences of different target groups. The development of an easily accessible database and virtual exposition "Coins from the Burgas Bay" based on the web platform for management and support of dynamic content would enrich the information provided through the Internet by recognized experts in the area of historical and cultural heritage of Burgas region.
- **Presentation of the Bulgarian cultural heritage in the context of European cultural exchange and its popularization.** The presence of the collection in the virtual space would allow everybody to reach it in any and every moment and learn more about the history and culture of the Burgas region. The information could be transformed into a more understandable form via changing the language and using visual effects and possibilities for selecting the level of its detail. The context based access to the information would promote its interpretation and its use in scientific researches by scientists from Europe and all over the world investigating the trends in the historical, economical and cultural development of the European society from ancient times to nowadays.
- **Accordance with the Bulgarian and European legislation** - The digital museum collection has to be correctly structured in accordance with the national (Bulgarian Law of Cultural Heritage, Ordinance № H-6 from 11.12.2009 г. for establishment and management of museum collections) and European legislation for the management of a system for access and use of digital objects by the target groups.
- **Faster and context-based access** -The digital representation of the museum collections provides faster access to the historical and cultural artefacts. The appropriate annotations to the exhibits and standardized relevant metadata descriptions would contribute to the context-based access to the digital exhibits (some present-

ing real arte facts, which have never been exposed to the audience before). Thus the work of a wide range of experts would become faster and more effective and the non-professional users would benefit by the easier and more comfortable access to the museum funds.

- **Improve the effectiveness of the museums' staff** - The digital information would also help to the museum specialists and experts who will be able to enhance their studies or to start new ones. It would also make it easier for them to exchange experience, information and knowledge with their colleagues from all over the world.
- **Social inclusion of citizens in presentation and preservation of cultural and historical heritage** - The digital presentation of the museum funds would provide an opportunity for the people with disabilities and/or people with low social status (for who visiting a real museum is difficult or absolutely impossible) to see and even to take part in the tracking, studying, preservation and presentation activities.

6 Main Activities

The development of the digital coin collection of RHM-Burgas comprises several activities such as modelling, program realization and testing the digital library. These activities could be systematized as follows:

A. Development of the functional modules and services designated to the different classes of users of the library:

a. functional modules for the end users;
b. functional modules for the editors of the digital content;
c. functional modules for the administers of the library.

B. Development the graphic design of the applications and users' interfaces.

C. Provision and maintenance of the access to the system.

D. Adding/inserting of the digital objects and their metadata descriptions and annotations in the library.

The technological activities for the development of the digital records and archives for the numismatic objects from the coin collection of RHM–Burgas:

E. Digitalization of the numismatic objects (photographing and primary processing).

F. Development of the template for the description of the numismatic objects in accordance with their specific.

G. Semantic description of the numismatic objects in accordance with the developed template; this activity require close collaborations among IT experts, museum specialists, archaeologists and numismatic experts.

H. Digital processing of the objects – graphic processing of the digitalized copies of the objects under standards developed by the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences.

I. Access and maintenance of the system.

J. All of the numismatic objects included in the library shall be protected from illegal use and unauthorized access.

7 Technological Aspects in the Development of Digital Library Saving Numismatic Objects

The digital library for numismatic objects (DLNO) is an Internet-based content management environment - a place where coins and pre-coin forms of different kinds and origins were documented, classified, and "exhibited" in order to be widely accessible to both professionals and the wide audience [7]. The library pretend to become a completely interactive multimedia solution that will provide services for registration, documentation, access and exploration of a practically unlimited number of coin objects and knowledge from the Burgas Bay and the end users can use this rich knowledge base through its flexible preview, objects complex search, improved selection, grouping and creative usage. The architecture of the environment follows the technological solution developed in the Institute of Mathematics and Informatics and used for the implementation of the Bulgarian Iconographical Digital Library [1], Bulgarian Folklore Digital Library [2][3], and Encyclopaedia Slavica Sanctorum [5]. It contains two main service panels Object data management and Administrative services, jointed to a Media Repository and a User Profile Repository. The Object data management panel refers to the activities related to content creation: add (annotate and semantic indexing), store, edit, preview, delete, group, and manage digital objects; manage metadata; search, select (filter), access and browse digital objects and their descriptions. The Administrative services panel mainly provides user data management and tracking user's activities. The export data services provide the transfer of information packages (for example, packages with DLNO objects/collections, user profiles, etc.) compatible with other data base systems. For example, with these services a package with objects could be transported in an XML-based structure for new external use in different applications. An important functionality for the DLNO is the virtual expositions management, also called virtual creation of coins' collections or virtual museum collection. The virtual expositions management covers the basic processes on creating, preview, update and close exposition (see Figure 1) [4].

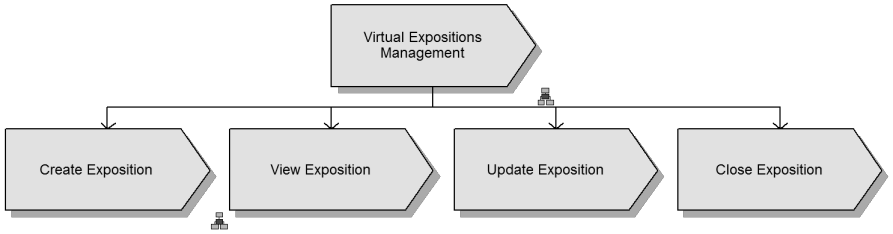

Fig. 1. VACD of the virtual expositions management process

Figure 2 depicts an EPC diagram of the "Virtual expositions management" process, applied in Bulgarian Folklore Digital Library. It shows the control flow structure of the process as a chain of events and functions.

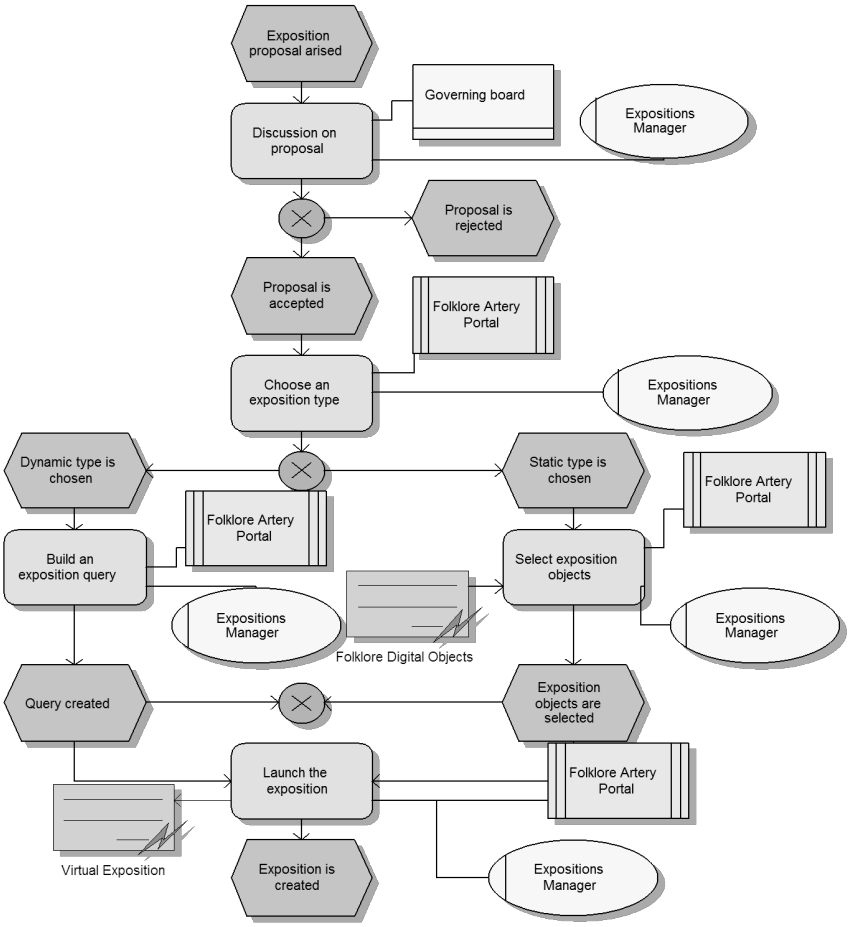

Fig. 2. EPC diagram of the virtual expositions management process

The functions present the actions and the tasks that must be implemented as a part of a business process, e.g., discussion of a proposal, build an exposition query, etc. Usually the functions add extra value to the process. The functions have input resources (e.g., digitized coins and pre-coin forms), create output results (e.g., the "launch exposition" function creates an exposition) and could spend a resource (e.g., human). The events constitute the changing state of the world after the execution of a process, e.g., a query created, exposition objects selected, etc. The events described the situation before and after an action are executed. The functions are linked to events by logical connections. In this way the control flow is defined [6].

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