

Business Modeling of the Application Architecture of the Bulgarian Folklore Artery

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Abstract. In an attempt to answer the need of wider accessibility and popularization of the treasury of Bulgarian folklore, a team from the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences has planned to develop the Bulgarian folklore artery within the national project “Knowledge Technologies for Creation of Digital Presentation and Significant Repositories of Folklore Heritage”. This paper presents the process of business modeling of the application architecture of the Bulgarian folklore artery, which aids requirements analysis, application design and its software implementation. The folklore domain process model is made in the context of the target social applications—e-learning, virtual expositions of folklore artifacts, research, news, cultural/ethno-tourism, etc. The basic processes are analyzed and modeled and some inferences are made for the use cases and requirements specification of the Bulgarian folklore artery application. As a conclusion the application architecture of the Bulgarian folklore artery is presented.

Keywords: Business Modeling, Information Portal, Bulgarian Folklore

1 Introduction

During the third year of the project “Knowledge Technologies for Creation of Digital Presentation and Significant Repositories of Folklore Heritage”(Folkknow)¹ it is planned to develop the *Bulgarian folklore artery* aiming to give various social applications (i.e., interactive distance learning/self-learning, research activities in the field of Bulgarian traditional culture, cultural/ethno-tourism, newsroom, etc.) of the collected folklore materials [1][2][7]. Moreover, this artery aims to aid part of the activities of IEFEM–BAS such as popularization and publishing of Bulgarian folklore, management of folklore artifacts/collections, on-line communication for the community, activities, document and projects management, education, research, etc.

¹ A national research project of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (BAS) that is supported by the National Science Fund of the Bulgarian Ministry of Education and Science under grant No IO-03/2006. Its main goal is to popularize and advertise the Bulgarian tradition and folklore in the global information Web space by exposing various folklore objects/collections selected from the fund of the Institute for Ethnology and Folklore with Ethnographic Museum (IEFEM–BAS) [1][2].

To accomplish this ambitious task, the team from the Institute of Mathematics and Informatics, BAS – the main software developer – decides to start with the identification of the main business processes of the application architecture of the Bulgarian folklore artery. After some use cases and references the team does requirements analysis in order to improve the application design and software implementation of the environment.

This paper presents the process of business modeling of the application architecture of the Bulgarian folklore artery, which aids requirements analysis, application design and its software implementation. The process modeling of the Bulgarian folklore domain is built in the context of the target social applications. In the paper the basic processes are analyzed and modeled. Some inferences are included. As a conclusion the application architecture of the Bulgarian folklore artery is presented.

2 Business Modeling in the Bulgarian Folklore Domain

The construction of models of software applications is designed to help all who are interested in the project to understand in the same way the need for a business process to be assisted by the software system [4], that is, to provide a common language for business analysts and application developers. This language is intended to provide a way for comparing business models and software models.

In the context of the target software application of the Folkknow project Bulgarian folklore modeling aims to examine the activities carried out within the target organization (viz. IEFEM), analyze and improve them. The goal is to involve the capabilities of modern ICT technologies and use them efficiently for the specific needs of the organization and the virtual presentation of the folklore domain.

There are different notations for process presentation (description). In Rational Unified Process, for example, IBM proposes that the processes be modeled using UML and its use cases and activity diagrams. A more popular standard is BPMN (Business Process Modeling Notation) of OMG (Object Management Group) company. For our project we choose VACD (Value Added Chain Diagram) and EPC (Event-driven Process Chain) diagrams of the ARIS² methodology [3]. Using them we will handle the business use cases as well as their improved models, which will be embedded in the target system. The ineffective processes will be modified by being placed in the system.

Through the observation of the target organization and its main activities we found some ineffective processes concerning the popularization and advertising of the Bulgarian folklore and particularly the presentation and exposure of intangible artifacts/collections, planning of real-time communication, exchanging research results, document management, project management, learning resource development and management, presentation of news and events. The next section presents in detail the analysis and modeling of particular processes.

² ARIS is one of the most used and powerful methodologies and platforms for modeling business processes.

3 Process Analysis and Modeling

Every organization has its primary and supporting processes. The primary ones are those which are directly related to the organization's main business goals. Supporting processes help carrying out the primary processes. The following VACD diagrams (in Figure 1 and Figure 2) show the processes which will be improved by the realization of the Bulgarian folklore artery environment.

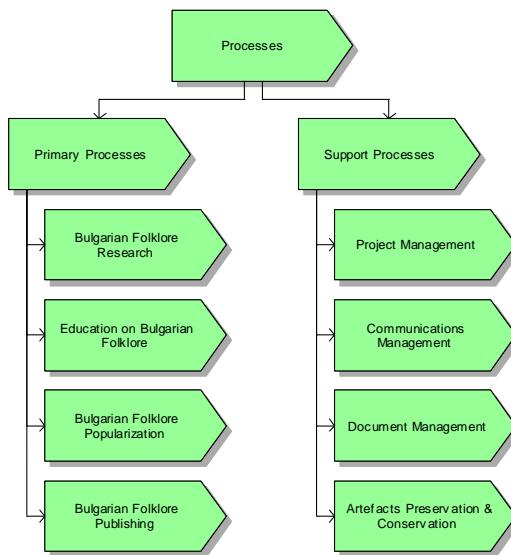


Fig. 1. Base processes

The *education on Bulgarian folklore* process includes construction and management of learning content on Bulgarian folklore and traditional culture. At present this process works mainly through using manuals and books with poor real demonstration of the intangible folklore objects and content. The future possibilities will provide innovative learning content management with selection and on-line demonstration of materials selected from multimedia digital repositories and libraries on Bulgarian folklore, content grouping, tagging, commenting, bookmarking, sharing, reducing or extending, printing, etc. On-line knowledge assessment using different assessment schemas will also be provided.

At present the *Bulgarian folklore publishing process* is achieved through traditional journals and books. The possibility of on-line publishing is not used yet. The future possibilities will provide on-line publishing and access to Bulgarian folklore materials.

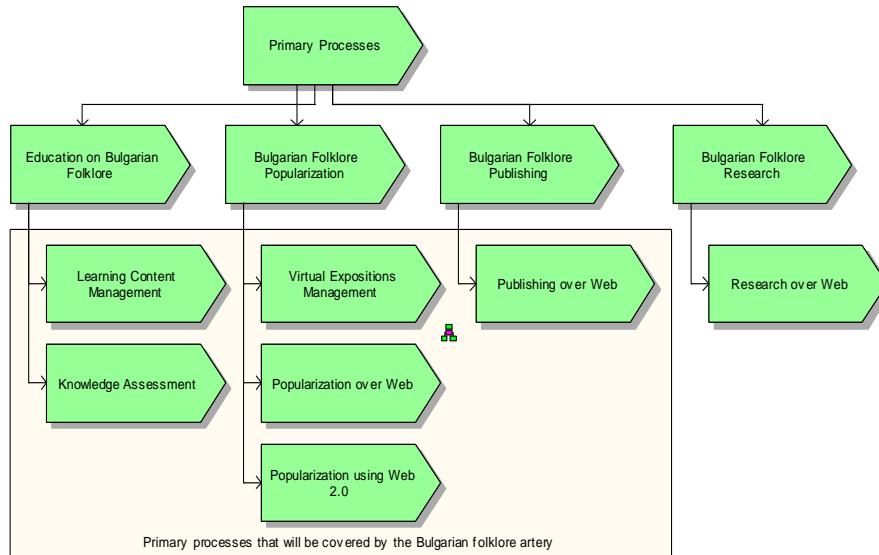


Fig. 2. Primary processes covered by the Bulgarian folklore artery

The *Bulgarian folklore research* is implemented with traditional tools and techniques without using the ability of contemporary information technologies. In order to improve the Bulgarian folklore research during the project the Bulgarian folklore digital library is developed. This Internet-based environment is a place where folklore objects and knowledge on the Bulgarian traditions and culture were documented, classified, and “exhibited” in order to be accessible to both professional researchers and the wide audience.

At present the *popularization (and also advertising) of the Bulgarian folklore* is done through several single initiatives conducted by the national government or the institution (incl. single project leaflets, conference presentations, simple institutional web-page). There is no scheduled and established process for popularization (and also advertising) of the Bulgarian folklore. The future possibilities will provide on-line virtual expositions of folklore content and artifacts, popularization over WWW (incl. also Bulgarian folklore digital library and other folklore repositories) and through such social networks as Facebook and Twitter. Section 4 presents our proposal for virtual exposition management in the Bulgarian folklore artery. We also plan to popularize the domain with the inclusion of actual news, events, projects, expeditions, science forums, conferences, etc. At present this activity is performed only through traditional means such as posters, banners and messages on information boards within the organization.

The support processes which we are considering include project management, communication management, document management and presentation and conservation of artifacts. The current *project management process* doesn't use the possibilities provided by ICT technologies and their automated organization and

management systems. This process will be fully modified using new information technologies and their tools. The *communication management process* currently takes place primarily through email between the individual participants in the team. Accordingly, the time it takes to organize a meeting or event between them is significant and depends on the number of participants. In the future it is envisaged that meetings and other events will be negotiated through active use of the capabilities of the global information space. To this end an appropriate functionality will be implemented, e.g., a discussion forum, regular online communication through Skype, ICQ or social networks, etc. For the *documentation management process* numerous deficiencies and problematic activities are now on record. In this case the critical processes are storage of documents, document sharing and editing and search in documents. In the future a tool for collective document processing and fast and efficient search in the available resources will be developed. All of the organization's documents will be saved in common repository with secure access and automation of services. For the *artifact presentation and conservation process* could be summarized that the folklore artifacts and materials are traditionally saved on paper, photo archive, audio records, video archive (rarely) and CD archive (rarely). Now, a digitizing and converting process is executed in IEFEM in order to preserve and to conserve this national treasure. During the second stage of the "Knowledge Technologies for Creation of Digital Presentation and Significant Repositories of Folklore Heritage" project a Bulgarian folklore digital archive and library [5][6] are developed in order to improve this process.

4 Virtual Expositions Management

The virtual expositions management will cover the basic processes on creating, preview, update and close exposition (see Figure 3). The process will be executed using the digitized content and artifacts from the Bulgarian folklore digital library.

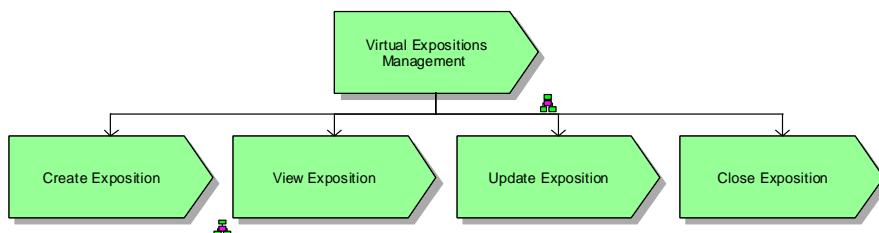


Fig. 3. VACD of the virtual expositions management process

Figure 4 depicts an EPC diagram of the "Virtual expositions management" process. It shows the control flow structure of the process as a chain of events and functions. 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., documents), 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 [3].

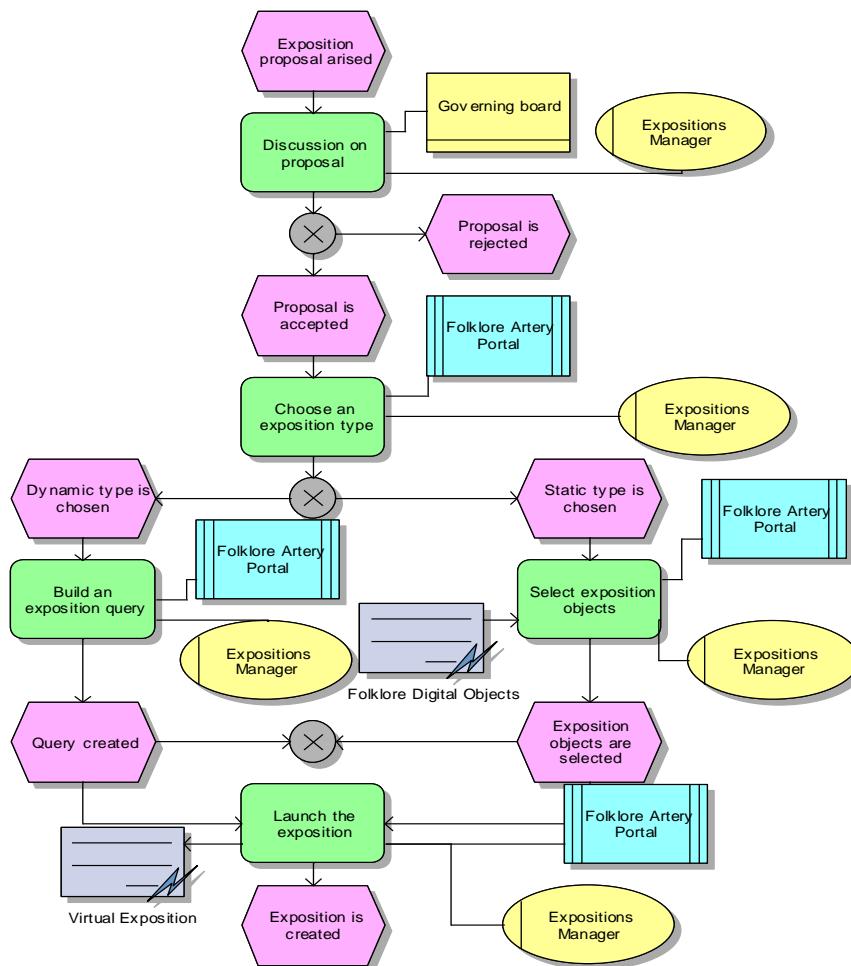


Fig. 4. EPC diagram of the virtual expositions management process

5 Inferences

After analyzing some of the key processes that were identified as inefficient for the organization, we can summarize the main problems that must be resolved when the

new system is introduced: a) lack of a good environment for teamwork; b) lack of a good environment for real-time communications; c) impossibility to expose intangible cultural heritage (objects and collections) to the public for popularization and advertising purposes; d) lack of an established practice of using the global information space and its resources in teaching Bulgarian folklore and traditional culture; e) lack of a space for dynamic publishing of news and reports on the domain; f) lack of efficient practices for managing documentation and projects.

The system which will be developed and implemented in the organization will help solving these problems by: a) providing a common environment (environments) for employees' teamwork; b) providing access to a library/repository with folklore artifacts and materials; c) providing a common environment for communication; d) providing information desk, news-room, Web 2.0 functionalities, on-line advertising; e) providing functional panel for virtual expositions of folklore artifacts; f) creating an e-learning corner managing learning content and assessing acquired knowledge on Bulgarian folklore and traditional culture; g) offering tools for collective document processing, fast and efficient search in the available resources; h) creating a common repository for all of the organization's documents and providing secure access to it upon authorization; i) providing project management.

These inferences are used as a base for the use cases and requirements specification of the Bulgarian folklore artery application.

6 Application Architecture of the Bulgarian Folklore Artery

On the basis of the business modeling made in the previous section and the requirement analysis done during the project, the application architecture of the Bulgarian folklore artery will include the following main panels:

Bulgarian folklore digital library (<http://folkknow.cc.bas.bg>) with the following functionalities [6] for adding/editing folklore objects, viewing the content of folklore objects, search (simple keyword and extended), file format conversion, user's data management, user's actions monitoring, other administrative actions, etc. The BFDL functions aims to serve a wide range of users—specialist and non-specialist. The BFDL system supports several user levels: administrators, folklore content editors, specialist viewers and non-specialists viewers. Their individual characteristics, needs, interests, motivation, and preferences are discussed in [6].

Virtual expositions of the Bulgarian folklore: This section shows Bulgarian folklore objects grouped in collections with interactive preview and social networking abilities (i.e. user tagging, commenting, liking, following & bookmarking, rating, etc.). The source of the objects is the Bulgarian folklore digital library, where the exposition creation and management is executed by folklore specialists.

E-Learning corner: This section implements the relation between the Bulgarian folklore digital library and a distant learning application. The core environment in use is a Learning Content Management System that supports assembling and delivering of personalized course content in a specialized e-learning context. A knowledge assessment tool is also planned.

Actual folklore news: This section aims to keep current and actual news from the Bulgarian folklore and cultural heritage domain. It will also keep all older news in an archive. Every news record can be tagged, commented or liked by the artery users.

Folklore discussion forum: This section provides possibility to join and enable the communication between different users (specialist and non-specialist), dedicated to Bulgarian folklore and traditional culture. Access to the forum will be granted through registration and authorization. The users have to accept certain terms and conditions to use the forum.

Folklore and cultural heritage conferences and science forums: This section provides actual information on the conferences, science fora and initiatives for digitization and virtual presentation of the folklore and cultural heritage domain.

Bulgarian folklore in the social networks: The Bulgarian folklore artery will actually become part of such social networks through implementation of Web 2.0 services. This section will be used for the wide popularization and advertising of the Bulgarian folklore in the global information space.

The artery will also provide links to other folklore and cultural heritage projects, resources and expeditions, project results dissemination and documentation, project team data, site map, terms and conditions, FAQ, keyword search, etc. The work on the functionality design of the Bulgarian folklore artery is in progress. It is planned that the implementation will use WSDL and SOAP.

Acknowledgements. This work is supported by National Science Fund of the Bulgarian Ministry of Education and Science under grant IO-03-03/2006 “Development of Digital Libraries and Information Portal with Virtual Exposition “Bulgarian Folklore Heritage”” from the project “Knowledge Technologies for Creation of Digital Presentation and Significant Repositories of Folklore Heritage”.

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