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# Implementation of Project Approach to the Formation of Electronic Information Resources

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*This paper discusses issues of the electronic library development in the higher school. The paper presents project-oriented approach, which is becoming one of the quality criteria of library information activity and analyzes the process of archival documents digitization with the use of the project activities tools. The paper reveals the importance of electronic resources in the educational and scientific activity. The paper proposes the ways of improving information and library activities in a university.*

*Keywords: project management, electronic information resources, project-oriented approach, information and library activity, e-library, digitization of documents.*

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## Introduction

The dynamism of economic and social transformations in this country involves the system of higher education into constant modernization. The necessity of renovation within academic and research processes in educational institutions evokes brand-new data demands. To meet these demands in the sphere of higher education one can use the library and data activity performed by university libraries.

By using modern technologies, these libraries create e-catalogues, private electronic resources and data bases (bibliographical and full-text data bases). Electronic catalogues provide long-term scientific and cultural heritage holding, storage of knowledge and documents, which means an important condition for the successful development of information society. This allows not only development for the libraries due to digital collections and repositories (open records) formation, but also enables them to distribute information via the Internet, broadening the notion of freedom of information and access to knowledge. Electronic resources become innovative media types and increase the efficiency of services for libraries' users.

Intensity of these modifications quite actively influences on all the library sub-systems and leads to a particular instability caused by rapid changes. Thus, the main task


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is maximization of practice of the current financial, production and human resources, i.e. implementation of the measurement system for these resources and introduction of tools for the efficiency improvement. Such goals can be put into action mainly by the project-based approach, and also by using relevant tools and technologies.

The project-based management includes organization, planning, coordination and control during the whole life-circle of a project, aimed at specific results that can be obtained by application of special control methods. Such approach ensures the precise result, provides control over all the risks and all stages within the task performance.

The project approach towards the formation of electronic resources is becoming one of the qualitative criteria for the information activity of libraries.

Implementation of the project-based management into the library administration is currently important since it allows solving certain problems and achieving certain results, that is quite important in the sphere of library activity in order to be sure-footed within the modern time and be demanded by the society (Bajmuhametova, 2013).

## Main focus areas for the Library and Publishing Complex of Siberian Federal University

The library and publishing complex of Siberian Federal University (LPC SibFU) is one of the main university departments that provide qualitative information support for the academic process and scientific researches.

LPC is aimed at a number of strategic missions:

- Formation of information asserts in the sphere of scientific and education programs for the efficiency improvement in research and academic activities;
- Providing legitimacy, authenticity, systemacity and applicability of information resources;
- Expansion within the territory of the Siberian Federal District by information resources and services through joining with cultural, educational, research and production (i.e. innovative clusters, in particular) local objects ( http://sfu-kras.ru/).

The development and application of brand-new forms of material presentation or, namely, of electronic learning resources, are considered to be one of the topical problems for SibFU. The LPC brings different projects on creation and development of electronic information and academic space into effect.

The complex is supplied with modern equipment that allows digitizing and accessing to electronic academic and scientific content. Availability of the material equipment and high potential of human resources give a way to carry out projects at high level and with high quality. Within five years the LPC digitizes its own information resources and resources of external companies.

## Structuring of archive documents digitization process

The development of regional informatization policy in Krasnoyarsk area implies creation of a brand-new, single information space. At the present time we are in need to form a basic regional system of conditions to support availability of essential information that may well enable us to meet our demands and cope with economic and administrative challenges at a totally new level.

One of the tasks set by the regional government is digitization of archive documents. Under the implementation “Development of archiving in the Krasnoyarsk Region 2013-2015” long-term target program, in 2013 there was an agreement concluded between the LPC administration and

the Regional State Public Agency "State Archive of the Krasnoyarsk Region" on the creation of electronic collection for the archive.

The purpose of the program is to provide preservation of the documents kept in the Archives of the Russian Federation and other archive records presented in state and municipal archives of the Krasnoyarsk Region. One of the program's focuses is building of the modern information and technological infrastructure that would allow extension of archive records availability for all users interested in the history of this region.

1. As for informatization, the program involves creation of electronic list in regional archives, increasing of e-fund use in the State Archive of the Krasnoyarsk Region. All these measures will not only provide access for all the citizens and organizations to search tools and electronic copies of archive documents including those which are based on remote access (mainly through the Internet), but also will improve the quality of information services for the population, public e-services, transparency and effectiveness of regional archives performance (http://xn----7sbbimrdkb3alvdfgd8eufwc.xn--p1ai/about/tselevye-programmy )

At the stage of pre-agreement procedures the parties defined the following work processes:

- Delivering of documents for digitization;
- Preparation of documents for digitization (pointing);
- Scanning;
- Documents cropping and converting into .tif;
- Documents quantity determination;
- Return of the document being pointed;
- Delivering of digital copies of documents.

In the course of agreement implementation there were some details complicating particular performance within the time limits set:

- Documents had different formats: not only A4, but also of larger format which caused some difficulties for proper scanners search;
- Poor physical state of documents;
- Uncertainty as to the number of documents in corresponding units;
- Necessity in documents pointing.

The performance results depended on the quality of original document: processing of old documents considerably increased the whole procedure time.

At the approval stage processes of bibliographical description and jpg-to-pdf converting were not included. That as the reason why the LPC staff did not concerned and timed them. All the conditions and requirements from customers concerning bibliographical description started during the process itself.

According to the pre-agreement, all the scanned archive documents were not held together and returned to the customer in a pointed form. However, within the contract performance the customer asked out to have digitalized documents clipped with new binding. Thus, time and resource estimation concerning this work were not carried out in advanced. Due to such misunderstandings between the parties, the contract work was stopped several times.

## Planning of the project on archive documents digitization

Taking into account all the gaps appeared during the initial stage of digitization and also the fact that this activity meets all the project characteristics, the LPC management decided to develop a process of digitization and description of archive materials using methods of project approach. Here we show the algorithm for development of the basic project-plan (Fig. 1).

The main aim of the project was to provide preservation of documents from the Archives of

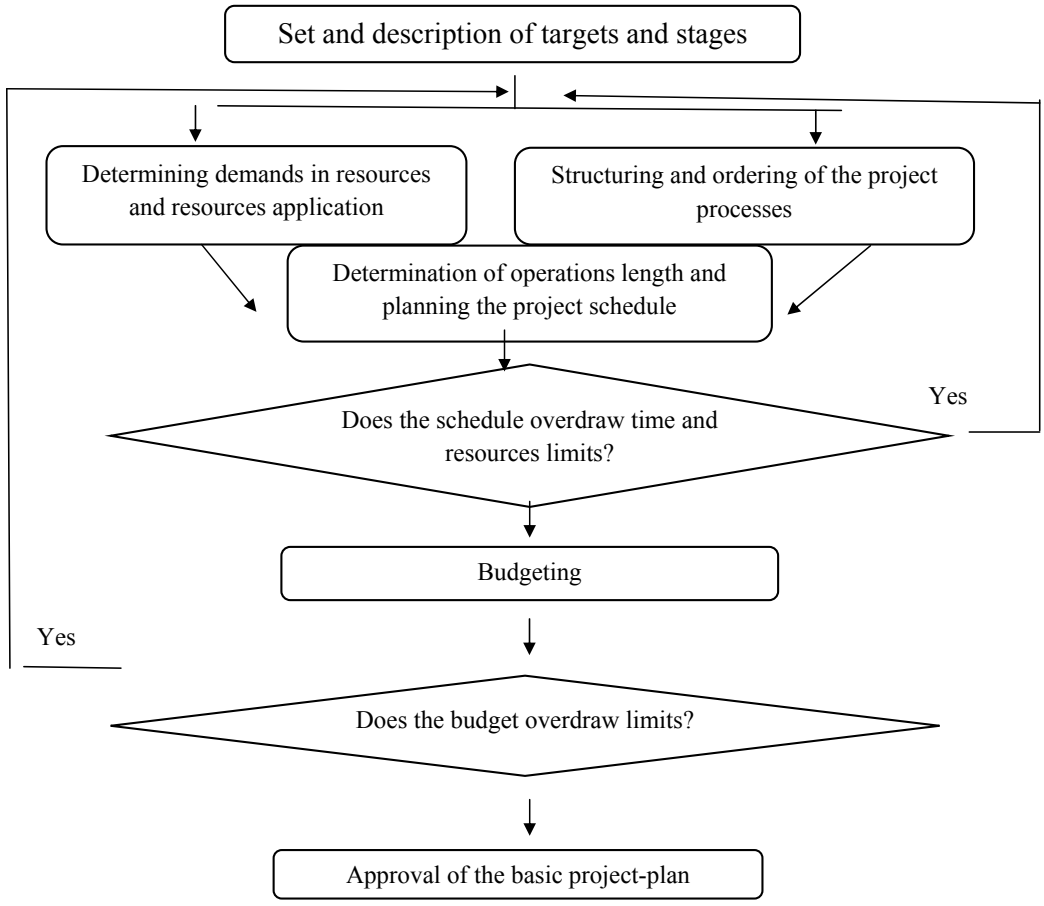


Fig. 1. Algorithm for development of the basic project-plan

the Russian Federation on the basis of modern information and technological infrastructure. An additional, though no less important task was also enhancement in processes of planning and organization of works on archive documents digitization.

In order to develop this project a set of stages were suggested (Table 1).

When it comes to the project planning it is necessary to calculate its efficiency. Digitization is a money-consuming process that requires significant investments. The project price includes material selection, identification of the legal status of documents, digitization, creation of metadata, accessing to digitized documents, quality control and assurance and preservation of digitized documents.

Evaluation of costs requires online access granting to digitized collections; it includes costs on development and support of technical infrastructure, as well as costs on support for digitized material itself. These costs vary depending on the type of services, as, for example, one is allowed only for displaying or downloading.

At the planning stage there was cost calculation for this project. The cost was calculated on the basis of wage rate for the contractors, cost of processing and scanning services, documents delivering, depreciation of equipment used within scanning, and cost of monthly support services. The equipment performance was tested on five different scanners. Also capacity rating on each scanner and for each employee was measured.

Table 1. Life-Circle of the Project

| Stage | Basic processes | Limits and assumptions |
|---|---|---|
| Initiation | Pre-planning according to demands and budget of the customer | Problem of correct targets set |
| Planning | Development and approval of techno-economic justification for the project, paperwork, development of the basic project-plan | Necessity in pre-calculation of equipment and human performance; the length of paperwork |
| Project implementation | Delivering of documents to the contractor; scanning; scan processing; introduction to the database; bibliographical description of the documents. | Untimely delivering of materials; effects in original documents; poor quality of scanning; failures in software and hardware performance; human factor |
| Completing stage | Delivery of works to the customer; accessing to electronic resources; delivering of archive documents to the customer | Correct lapses; system debugging |

The most well-known document in the sphere of project-management that is practically used by specialists in many countries is presented by the PMI body of knowledge (http://sfu-kras.ru/). According to this standard, within the project-management one may use a number of special models: goal tree; decision tree; work breakdown structure; organization breakdown structure; responsibility matrix; network model; used resources structure; cost structure.

The implementation of this project requires fulfillment of a specific set of measures, related to the analysis of opportunity to perform the project, techno-economic justification, working project, contract activity, organization and financing of the project works, resources and course planning, completion of the project. The work breakdown structure (Fig. 2) is the main mean for creation of the project-management system, since it helps to solve problems concerning work arrangement, liability distribution, cost evaluation, accounting system structuring; it also effectively provides support to the procedure of data acceptance related to the work progress and reflects results in the information management system for the further work schedule, cost, resources and time streamlining.

One of the essential elements of the project structure is its participants. Identification of all the participants, their determination, degree of responsibility and functions provide us with effective planning of actions, placing people in charge for particular operations, and motivate each participant of the project to carry out their work.

The main participants of this project are (Fig. 2).

The project owner, i.e. the Regional State Public Agency "State Archive of the Krasnoyarsk Region" is the party interested in the project implementation and goals achievement; the future owner of the project results. It determines basic requirements to the project and provides financial support.

The primary contractor – LPC SibFU – is the organization that accepts obligations on professional, proper-qualified and in due time carrying out of the whole complex of work from its planning to completion. Implementation of the project is accomplished by the project team that includes personnel form the Resource center, Innovative center, Publishing center, and managed by the Vice Director of the LPC. Relations between the participants are regulated by contracts, cooperation agreements, service contracts concluded according to the Civil Code of the Russian Federation and other statutory instruments.

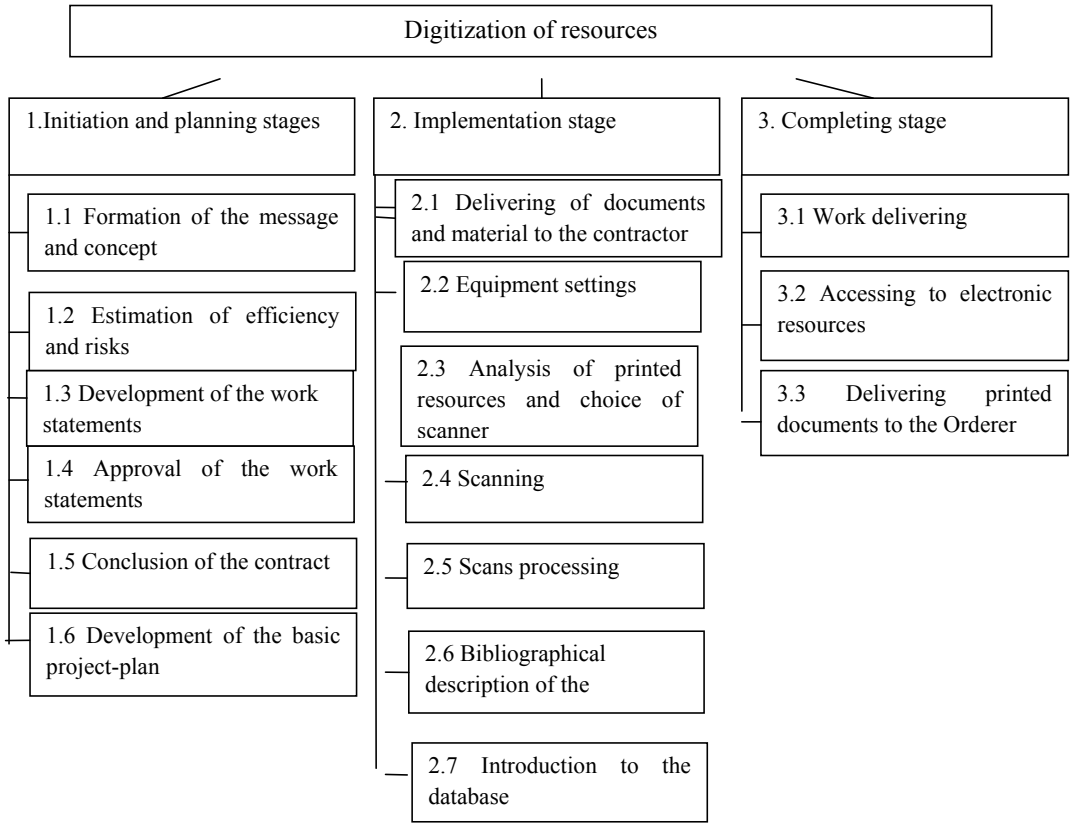


Fig. 2. Work Breakdown Structure

Further, we analyzed resources which are necessary for the project implementation (Fig. 3).

The time management includes processes which support timely completion of the project (http://sfu-kras.ru/): schedule planning management; content identification; specification of operational interactions; evaluation of operational resources; evaluation of operational length; development and management over the schedule.

One of the key goals in the schedule development is estimation of approximate dates for start and completion of the project processes including limitations set by the resources. For the archive documents digitization we used following tools: the critical-path method, GERT-method and network matrix.

The network model of the project has been developed through Spider Project software on the basis of the earlier work breakdown structure in the following order:

1) Generally describe the project: creation of the work breakdown structure;

2) Prepare a list of operations (works, tasks) for the project;

3) Prepare a list of resources;

4) Determine interactions for operations;

5) Estimate resources for the project performance;

6) Estimate costs of operations, resources and aims of the project;

7) Determine limits on financing, delivering and time;

8) Complete the project schedule including all the limitations;

9) Streamline the content of resources used;

10) Form the budget and distribution in time of target spends.

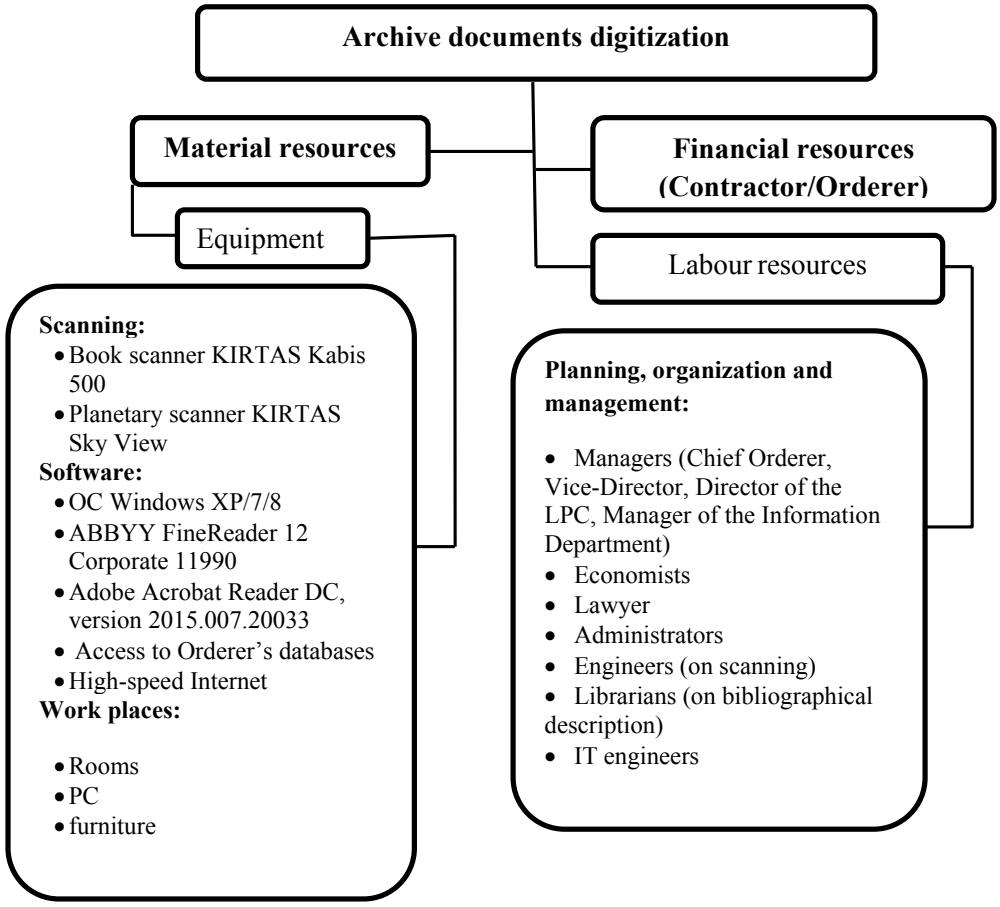


Fig. 3. Recourses tree

Estimation of the network project model allowed us to measure implementation terms (critical-path method), starting and completing dates for each works as well as time resources.

Together with this, archive documents digitization presents not always a linear and determined process. It is explained by the necessity in selection of different scanners, correction works and etc. Thus, under the schedule development the process of technical digitization was analyzed in details by GERT-method which involves the theory of signal block-schemes, statistic project networks and decision tree (Fig. 4).

Here we show explanation of the symbols used in Fig.4: A means equipment settings; B means analysis of printed sources and choice of scanner; C means choice of Kirtas Sky View; D means choice of Kirtas Kabis 500; E means scanning of documents; F means checking the results of scanning ( there always are high chances that one need to re-scan a part of images, since some defect may well appear in the course of work); G means additional scanning; H means processing in special programs and converting to PDF format; I means processing of correct items; J means checking; K means bibliographical description; L means introduction to the database.

The use of project-based approach in information and library activity provides an opportunity to:

- Increase the quality of digitized resources;

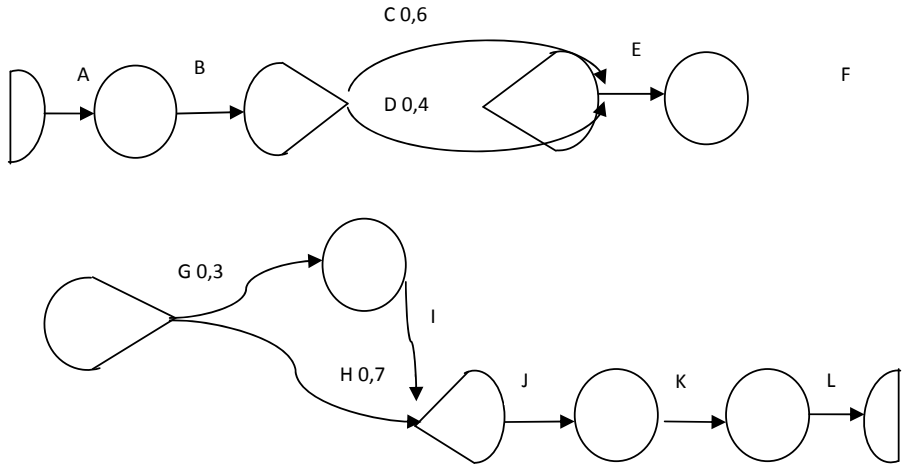


Fig. 4. GERT-method Model of Digitization

- Effectively use current resources (including human ones);
- Increase labour productivity;
- Increase the level of cooperation between departments;
- Structure operation activity;
- Streamline terms of decision making;
- Automate the most time-consuming and critical processes;
- Increase motivation of participants.

Thus, project can be considered as strategic initiatives focused on particular goals achieving in organization development. The project-based approach enhances and develops different areas in information and bibliographical as well as in library activities in the university.

## Conclusion

According to the results of expert analysis the following positive effects on the society and the project's participants were shown:

- Providing preservation of archive documents;
- Creation of resources e-collections and full-text online databases;
- Time-saving for users caused by streamlining of search, access availability to book and periodical resources;
- Archive document access expansion;
- Preservation of the cultural and scientific heritage, including rare archive records for next generations.

At the present time the importance of digitized resources is rapidly increasing; databases have become not just an additional element to traditional library funds, but their essential part – more advanced, practical and accessible.

The use of digital resources considerably improves the efficiency of learning and research activity. That is why libraries should extent the amount of e-resources, as well as provide a wide access to huge flows of accurate scientific information, since electronic resources allow quickly receive knowledge about new tendencies in science and society.

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# Реализация проектного подхода при формировании электронных информационных ресурсов

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*В статье рассматриваются проблемы формирования электронной библиотеки в вузе. Представлен проектно-ориентированный подход, который становится одним из качественных критериев информационной деятельности библиотек. Анализируется процесс оцифровки архивных документов с использованием инструментария проектной деятельности. Раскрывается значимость электронных ресурсов в образовательной и научной деятельности. Предлагаются пути совершенствования информационно-библиотечной деятельности в университете.*

*Ключевые слова: управление проектами, электронные информационные ресурсы, проектно-ориентированный подход, информационно-библиотечная деятельность, электронная библиотека, оцифровка документов.*

*Научная специальность: 24.00.00 – культурология.*