Significance of projects for building the infrastructure of libraries

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Abstract

Implementation of projects from the wide scale of development programmes provides the conditions for building the infrastructure of academic libraries, their innovation and extension of their services. The project's success in terms of achieving benefits is determined by correct definition of objectives. The correct mechanisms for specification of objectives, their quantification and definition of benefits can assure the improved infrastructure of libraries. Priority in the area of technical research and development infrastructure is building a virtual network providing essential services for the research and development community. The EU calls which provide the possibility of obtaining non-refundable funds for the construction and development of tools for the of knowledge and technology transfer from research into practice, reflect the above-mentioned objectives. One third of the EU budget was allotted to the budgets of the Structural Funds and the Cohesion Fund for 2007-2013. Priorities for improvement and attractiveness of services in the EU calls challenge the libraries to respond to such stimuli and adapt to social demands. A library as a science and information workplace that intends to expand and improve their working conditions and services must have a vision and a strategic development plan with defined mission and priorities. Then, it can find mechanisms to implement the development objectives in specific projects. The planned objectives cannot be attained without extra-budgetary resources which can assure the access to electronic resources, modernization of the library interior, purchase of new hardware, all with the aim of increasing quality of services and acquiring new technologies. In the current period of the knowledge society development, some libraries hesitate to use all the chances offered to them. They should, however, be prepared for dramatic changes of their mission, and courageously defend and maintain their present position. They must strive to add value to the library processes of providing rapid and goal-oriented access to data, information and knowledge. Insufficient funding cannot be considered a good reason for inactivity. Libraries should be open to experiments, anticipating possible future development of their functionality, partnerships and efforts in gaining new, broader and more demanding competences.

Introduction

As traditional information institutions, university libraries cover two basic fields: research and education. The question is how and whether or not the libraries saturate the higher education institutions with the information enabling them to effectively play their role in the innovation process. Project activity is one of the ways of raising the necessary funds to ensure the university involvement in the research and development programmes. **To respond the calls of the development programmes, libraries must know the related strategies in the country and particularly in their parent institution.**

Long-term objectives of the governmental science and technology policy in the category of "ICT-assisted knowledge technologies" in individual countries highlight the necessity of developing the technologies that facilitate the data search, classification, interpretation and implementation, as an essential condition of the current knowledge society development [3]. Role of the technical research and development infrastructure (its renovation and innovation) is to:

- provide the basis for building a virtual network
- provide the services to the research and development community

- provide conditions for the design of the institutional knowledge map
- support the development of intellectual capital of an institution's research potential.

Strategic development plans and vision of university declare the reinforcement of the universities' position in the European Research Area. The documents related to the university concepts and strategies reflect this idea while identifying the following priorities:

- carry out basic activities such as education, research and knowledge transfer while regarding social responsibility in relation to the domestic and foreign environment
- continuously strengthen and improve academic excellence and quality in all areas of activity
- guarantee free space for scientific research
- build the equipment and laboratory infrastructure
- popularize and promote the results of university research activities.

In searching for the opportunities of applying for the projects within various programmes, the following areas are of key importance:

1. ICT-assisted knowledge technologies
2. knowledge and intellectual potential
3. promotion of science and research
4. design and development of information society
4. free scientific research and open access to scientific knowledge
5. information sources, storage media and institutions, digitization
6. service innovation and infrastructure development
7. national programmes of culture support

1. Infrastructure support for research and development

High-quality infrastructure modernizes the support for science and research, and simultaneously facilitates the achievement of global objective of knowledge transfer. Innovative elements of the hardware and communication basis of schools bring added value to the output of teaching and research activities. Renovation of the R & D infrastructure and equipment in universities, research institutions, research centres and other research and development institutions (including academic libraries) contributes to the development of scientific potential of the institution, becomes the dominant factor for the cooperation with foreign scientific entities and supports their own scientific research.

Construction and modernization of the research and development infrastructure and the related issues are becoming highly topical in the contemporary academic environment. Analysis of the current state has shown that the systems supporting **presentation of the scientific research results** are not being paid the necessary attention, though the urgency of its construction and development has been generally approved. The results of the above-mentioned analysis have confirmed that service centres (including academic libraries) record the results of creative work in the field of science and research (databases of research and grant projects, patents and publications of the staff, subscription of the journals in the field of intellectual property etc.), but not all of them are able to **develop the tools to transfer knowledge** from the collected data. Without a well-built infrastructure, they cannot build effective mechanisms for the knowledge presentation in the fields of education, science and research, and thus they cannot use the tools for the transfer of the latest research results into practice.

The above-mentioned findings and results of the analysis identified a set of issues related to the:

- place where information originated and dissemination of latter in individual organizational units of the faculty (university),
- lack of information or lack of activities,
- places of collecting information and diversity of the collection methods,

- method of disseminating the information,
- different intensity of links between components of academic activities,
- diversity of places for storing and updating the information,
- systemic and systematic work with data and information, and its effective use.

The outputs of the infrastructure construction and renovation may significantly effect the functioning of the whole institution. Support systems for the top management of science and research primarily provide services to the faculty (university) scientific environment as an information base for the global and strategic decision-making. These systems must use all the internal information resources designed on the lower levels of management, external information sources as well as other information in the usual and unusual standardized formats.

Possibilities of the research and development funding from foreign sources [6]

Support for international cooperation in science and technology is a key priority in accordance with the research and innovation policies. Involvement of researchers from universities, research organizations and entrepreneurial spheres into the European and international networks and research and development initiatives is a prerequisite for excellence in science. The following EU framework programmes for research and innovation along with other European programmes and initiatives inform about the possibilities of funding R&D from foreign sources:

- COST - (**http://www.cost.eu/**)
- Horizon 2020 - (http://ec.europa.eu/programmes/horizon2020/)
- European Union Strategy for the Danube Region (http://www.danube-region.eu/)
- European initiatives linked to Horizon 2020
- EU Joint Programme – Neurodegenerative Disease Research (JPND) (http://www.neurodegenerationresearch.eu/)
- International Visegrad Fund (MVF) - (http://visegradfund.org/)
- EUREKA - (http://www.eurekanetwork.org/)
- COST - (http://www.cost.eu/)

1.1 Sources of funding the field of technical infrastructure of libraries

In the current period of the knowledge society development, some academic libraries hesitate to use the options offered. One of the challenges is to win leading position in the university in the processes of creativity, communication and education. Libraries should be prepared for radical changes of their mission and behaviour in the effort to retain their previous position, add value to the academic processes and provide the rapid and goal-oriented access to data, information and knowledge. Insufficient funding is an inappropriate excuse for inaction. Academic libraries should not be afraid of experiments in anticipating possible future development of their functionality, partnerships and efforts of the new, broader and more demanding competences [1].

Revenues of the public education institution consist of [4]:

- subsidies allotted on the basis of performance in accredited programmes and the results of the research activities of the school,
- tuition fees,
- returns from school property
- returns from entrepreneurial activity
- expert sources (donations, etc.).

Priorities in funding are:

- strategies for obtaining alternative sources of funding;
- acquisition of the projects financed from the EU structural funds, emphasising the completion of the research infrastructure of the faculty;
- update of the faculty investment development.

The area of technical research and development infrastructure declares the utmost importance of building and operating a virtual network with the aim of supporting essential services for the research and development community. In the current economic situation, **the EU Structural Funds calls (mainly within the Research and Development Operational Programme)** provide the possibility of obtaining non-refundable funds for the construction and development of the tools for the transfer of knowledge and technology gained through the research and development into practice. One third of the EU budget (about € 347 billion) has been allocated to the budgets of the Structural Funds and the Cohesion Fund in the period 2007-2013 [2]. In the field of reconstruction and technical innovation of infrastructure, the value of sustainable innovation is the most significant attribute of these changes.

"Development of the memory and fund institutions" operational priority within specific priority of "Development of electronic services, content, skills and infrastructure for public administration" is of particular importance. Its objectives are e.g.:

- improvement of the system of knowledge acquisition: purchase of information sources, databases etc.,
- improvement of the systems for knowledge protection,
- improvement of processing the acquired knowledge,
- digitization of knowledge, improvement of the scope and capacity of digitization, equipment of the digitization units and accessibility of the digital content [5].

What would greatly help libraries in the search of opportunities for obtaining extra-budgetary resources is a unified portal for publicizing the opportunities for libraries. The 7th EC Framework Programme for research, technology development and demonstration activities for the science and technology development for 2007 - 2013, or eContentplus (http://europa.eu.int/econtentplus) were p**otential sources of funding** for the library activities.

For academic libraries, the priority is to focus their attention to the new EU Framework Programme for Research and Innovation, Horizon 2020 (programming period 2014-2020). Long-term objectives of the education, science and research, development, innovation and creativity encouraged all universities to actively participate in the EU programs and promote international cooperation, especially within the **Erasmus for All** and **Horizon 2020**. In these programmes, libraries may find an opportunity to start the activities in the field of the open access to scientific information, since it is the academic libraries that own, process and store the data.

2. Output of academic libraries in the renovation of the science and research infrastructure

To fulfil their mission in the field of education and excellent research, academic libraries in universities must become agents of change. Academic libraries support decision-making processes of university. The strengths of libraries are as follows:

1. they are part of the scientific research base of educational institution
2. they can handle, select and properly dose information
3. they dispose resources and access to integrated information
4. they have the skills of supporting the science and research activities (the skills of searching and retrieval, and experience in creating information products)
5. besides traditional services, libraries provide extra services tailored to the scientific profile of the institution

6. they process, store and register the outputs of research activities, carry out analytical work and calculations with application of bibliometric methods.

Knowledge of information processes and information behaviour enable academic libraries to specialize their services and activities, and develop a superstructure of their activities. It actually means rearrangement of the academic libraries' activities as a result of the transformation of classical organization of information to the management-oriented organization of information. In the current academic information environment, it is necessary to search for the new methods of using information and organization of information structures, which are reflected in new products and services of academic libraries. The future academic library, its role and position will **combine and integrate the knowledge and information content** by using the integration mechanisms of accessing information, interaction, retrieval, analysis and organization of knowledge, along with problem-solving and detailed knowledge of stereotypes of information behaviour in the academic environment [9]. To be successful, an academic library must have a portfolio of values that can be valorised in projects.

The areas where libraries can submit projects:

1.	EU framework programmes for science ad research support	» information systems
		» open access to scientific information
2.	programmes for improving the research and development infrastructure	» information sources
		» equipment of libraries
3.	programmes for the intellectual capital development	» acquisition
4.	programmes for the knowledge and technology transfer	» increasing quality of services
		» via intellectual property
5.	programmes for human resources development	» information education
6.	programmes for the memory and fund institutions development	» electronisation of services
		» digitisation
7.	grants of Ministry of Culture	» cover all spheres of library activities

3. Examples of challenges for academic libraries

Quality of Research University will always require relevant information background for the educational and research processes. **The reviewed status of knowledge in the university hierarchy of values** (the concept of knowledge as a universal benefit which facilitates organization of all faculty components) necessitated a**ctive participation of academic libraries in projects. K**nowledge is more than the quantitative growth of information, it is rather the ability to generate, organize and process information. Academic libraries are the workplaces that may facilitate the organization of support systems for science and research.

The STU MTF Academic Library participated in projects the value of which achieved € 1.5 million. The projects were supported by the EU operational programmes of "Research and Development" and "Education":

- **Knowledge Centre of Intellectual Property Organisation.** Aim**:** support to the management of intellectual property rights in research organizations, development and operation of the processes providing comprehensive support to the management and protection of intellectual property rights in the research organizations financed from public funds and joint research institutions. The project provided the Academic Library with the funds to purchase

literature, mobile shelving, equipment for a specialised classroom, and electronic resources from patents [8];

- **Knowledge-controlled tool system for monitoring graduates in practice in the process of integration into EU.** Aim: developing mechanisms for successful performance of graduates in practice and establishing the Alumni Association in the Faculty. The project enabled the Academic Library to purchase technical equipment and literature;
- **Human Resources development in the field of research and development for the Workplace of Materials Research within USP-CAMBO.** Aim: develop an education programme for the Faculty researchers and doctoral students who have completed the programme in the working groups focused on materials research and utilisation of ion beams. Their knowledge was theoretically deepened by professional lectures and on-site training using unique equipment. Within the Project, the Academic Library gained access to seven electronic sources;
- **Knowledge map** (the project is currently in the phase of preparation) Aim: construction of an excellence workplace for digitization of the output of research activities, and an institutional repository with the appropriate quality assurance of protection and storage of creative, scientific, intellectual activities resulting from the organization's research activities, acquisition of electronic resources and purchase of literature. This activity is aimed at the acquisition of machines and devices for building a digital workplace, building a system for long-term preservation of digital documents, and building the infrastructure for the operation of the digitization workplace;
- **Knowledge faculty for economic practice** Aim: development of tools and environment for the knowledge faculty for economic practice, where needs analysis is based on the long-term objective of increasing the degree of the Faculty responsibility for the transfer of knowledge into practice, and development of a knowledge society. A significant benefit of the project for the academic library is in the field of **information education** (a series of lectures for PhD students and researchers in the field of navigation in electronic information resources), along with the design of information products from the acquired electronic sources for the target group and the Faculty partners. From the collection of e-publications, the Academic Library developed the information products mapping the current scientific research environment of electronic resources in terms of the tasks solved on the one hand, and the scientific research profile of an individual (researcher and Ph.D. student) as well as the partners from practice on the other hand. The common denominator of the project outcomes (access to electronic journals and books) is improved understanding and application of the information content that support the research, knowledge transfer and orientation in the scientific area. This introduces new information services for the project target group - each member of the target group received an information package containing the texts in accordance with their scientific research focus, topic of their thesis etc. In addition, the Academic Library can provide similar output for the project partners. Without obtaining the project funding, it would be impossible to provide such extra services with added value.
- **Projects of ICT infrastructure.** Aim: further virtualisation and deployment of the new modern electronic methods in the teaching and research processes (e.g. the modernisation of audio-visual technology in self-access centres with the highest possible standard of multimedia applications, interactive whiteboards, better Wi-Fi network coverage, powerful servers for data distribution etc.). The project output provided the STU MTF students with access to electronic textbooks, digital objects of publication activity and digital archives of all final theses elaborated at the Faculty since its establishment [7].
- **Project of grant support.** Aim: to build a digital storage of all Faculty digital objects.

Conclusion

An innovative approach to building infrastructure with the support of structural funds provides the Faculty Academic Library with the possibility of:

a) building an integrated information system supporting science and research and providing controlled access to the digital content repository,
b) innovation of the provided electronic services of research support and development of information products for the given profile of researchers and PhD students,
c) possibility to access unique information sources (databases, licences, ...) and thus modernise the environment for the development and implementation of technologies enabling to search and interpret knowledge,
d) acquisition of library stock via purchasing unique library collections, and thereby improve the profile of the Library collection,
e) refurbishment of the Academic Library interior with modern equipment and facilities,
f) building the technical infrastructure for the institutional research and development support with strong presentation impact.

Quality of the organization's knowledge potential and intensity of its development is always closely linked to the information management. Information management of academic libraries must justify the effectiveness and efficiency of research support for the faculty by the quantity and quality of outputs.

It is not simple to measure the effectiveness of the project outcomes of academic library. Financial costs of development and operation can be precisely quantified, but the resulting effects are difficult to measure. While, for example, marketing information system can measure the increase of financial income from the sales, the effects in science and research can be measured only indirectly. Indirect revenues are actually not quantifiable, as they are manifested on the side of user as the acquisition of consolidated information for solving the research tasks. Results of science and research are influenced by many factors, and it is therefore impossible to define a specific share of contribution from the library projects in the overall support and promotion of the university research activities. Revenues of economic value can be estimated only by using an intricate system. Quantification of increased revenues can be done based on the higher number of approved grants and increased students' interest in study at the faculty (thanks to their decision motivated by the information about a well-equipped library, access to electronic resources, etc.).

The nature and extent of the benefits of project implementation, and evaluation of library support tools of science at the University may contribute to the:

- integration and rationalisation of generating and processing the information for the Faculty research projects,
- improved quality and extent of the Academic Library services,
- larger space for operational control of relevance of the information provided.

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