National Infrastructure for University Repositories Possible Model

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Abstract. Paper stresses on the active role of university repositories in sustaining a long-term strategy to increase impact and visibility of Bulgarian research. Authors would like to draw the attention of a critical disadvantage of the research exchange progress in Bulgaria and suggest continuing the development of good practices, in establishing a national information infrastructure, based on an already functioning integrated platform. A short description of Primo Discovery and Delivery solution potential is discussed to show the variety of functional and technological solutions that it can add to a national-wide research exchange network. A brief overview is made of the first institutional repositories, incorporated in Primo and the positive outcomes of the integration.

Keywords: institutional repositories, scholarly communication, open access, e-publishing, research output, content management, information infrastructure, universities.

1 Introduction

Open access to scientific information is achieved from 1991, following the idea of the physician Paul Ginsparg, which in 1994 has its logical continuation in the „self-archiving in internet" technology, introduced by the Professor in Psychology Stevan Harnad. The development of the communication structure of internet, adding new protocols for data transfer allows simultaneous "publishing" of research results, whereas scholarly communication accelerates and access to the newest research output is immediate.

The realization of the ideas from 20 years ago had an unexpected global impact on the scholarly communication. University institutional repositories nowadays have a sufficient place in developing scholarly communication on high technological level. They are the main source for simultaneous release of new and cutting-edge research results worldwide. The network of university repositories is flexible in adopting strategic, technological and data transfer means and solutions to spread wide the scientific achievements among vast community. They are thus recognized as the backbone of the modern information network that links information and cultural institutions on a

global scale and serves as the main step in the paradigm of multilevel information infrastructure.

2 The Essence

According to Lynch [1] digital archives is "the basic research infrastructure in the digital age", as well as a new strategy, allowing universities to acquire strong systematic approach to accelerate changes in research and scholarly communication. A repository is a set of services, offered from the institution to its academic community for collecting, preserving, and disseminating digital copies of institutional output.

Changes, shaping the environment of modern research open a new study field on library functioning level, where libraries can actively and immediately participate in scholarly communication transformational processes. A short description states that it is a "creation, distribution, use, integration and manipulation of knowledge", connected with education, research and scholarly achievements"(Scholarly Communications Group, Washington University in St. Louis). Traditionally the university library acquires the input and output of this cyclic process. The university library generates knowledge, based on its resources, and consecutively the research output joins again the library information resources. The library is a natural ally to scholars in scholarly communication system. The new library functional level of an access point to knowledge could turn into a huge challenge. Many libraries nowadays host and maintain collections of e-theses and dissertations, administer institutional repositories, support scholar e-publishing, raise awareness of open access journals and open access publishing. To suit its new function of disseminating knowledge, according to Wm. Joseph Thomas [2], the modern university library should keep pace with changes in publishing business and tailor services for researchers [5].

They could be divided respectively in two major groups:

1. Popularization and training:

- Copyright awareness;
- Compliance with funding institutions guidelines;
- Author training on open access publishing;
- Traditional and open access publishing trends;
- PhD students training on submitting e-dissertations;
- Events – presentations for lecturers, advocacy, Open Access Week, etc.

2. Hosting and digital content management:

- University institutional repository hosting;
- Digitizing of contents, if necessary;
- e-Publishing;
- Digital content management;
- Additional services, as indexing and peer-reviewing;
- Interoperability and transfer of meta-data.

The university library is in coordination with other university units, such as university publishing houses and technical support departments, as well as outer institutions - government and non-government organizations, to successfully complete these actions.

3 Background

According to Directory of Open Access Repositories six institutional repositories have been launched on a national scale. The New Bulgarian University Scholar Electronic Repository (NBU SER) is the first repository in the country. It stores 1425 items (06/13/2014) on Eprints platform. Authors, lecturers and post-graduate students, deposit on a voluntary base their output. Deposit manuals are also available in Eprints system. The university library mandates and manages the archive. The other repositories in the country are based on DSpace Open Source. The multidisciplinary Electronic Repository of the Central Medical Libraryis is hosted and maintained by the Medical University in Sofia. The interface is in Bulgarian and English. There is no explicit data on meta-data transfer and full-text policy of usage, as well as submission policy. It holds currently 497 items (books, articles, theses and learning objects) and information of the repository was last reviewed in 2012. Accordingly, the Academic Research Repository at the Bourgas Free University accounts of 412 e-prints (03/12/2014). User manuals are incorporated in DSpace system and it is run also by the university library. The only exception is the Research Repository at Sofia University, with 795 artefacts (03/11/2014 г.). Depositing is voluntarily and instructions on submitting are available for end users. The difference is that it is not hosted by the university library. Bulgarian OpenAIRE Repository is also based on DSpase, version 1.6.2. It hosts 118 books in various subjects, in English, and is maintained by the Institute of Mathematics and Informatics of the Bulgarian Academy of Sciences (BAS). It is part of the AIRE Project and provides access to all peer-reviewed publications in ERC funded FP7 projects in Bulgaria. It lacks a sustainable policy in meta-data reuse, archiving and accessibility options.

As it was already marked the organization of an institutional repository is not a prerequisite for successful research management. It is a valid statement that the open access publications contribute to author impact and increases citation due to priority document indexing of institutional and subject repositories in Google Scholar. Despite the global openness of research works in the four mentioned digital archives, a lack of long-term sustainable and development strategy component is figured out – national information infrastructure of institutional repositories is not available. Research information infrastructures include scientific collections, archives, structured information and ICT-based infrastructures and services. They support top-level research and can be organized at national, regional, EU Member States, European and global level. “Research libraries need to become visible actors in strategic discussions on RIs and should actively explore their engagement in research data infrastructures. Open Access, open science (data), research data infrastructures and management are the catalysts to get research libraries back into the awareness of researchers beyond the

humanities and social sciences. Open Access is global - but implementation is local. [3]" The idea to set a national exchange network for cooperative actions in the field of research communication dates back in the 80ies. The main objective of the network was to link together research, academic and public libraries in multilevel network for exchange of documents and services. The project took the name NALIS, staying for National Automated Library and Information System. Back in the 20th century last decades some indications of the upcoming fast technological changes have been somehow sensed from librarians and information specialist and Bulgaria was preparing to meet them, striving at first for equal automation of libraries (meaning purchasing of equipment and software and building a network, predicting its capacity for further development, etc.), and still not suspecting the huge economic and political collision, to be entered at the end of 1989. Archives and other cultural institutes were not considered at that stage, but the project was that thought to be open for new actions. It was discussed and featured in the centralized management strategy of the libraries and was planned to take part in several stages. The state at that period was fully responsible for the completion and centralized funding of the project. NALIS system did not succeed to see its start because of the end of the communist government and economic uncertainty. In the beginning of the democratic development, Bulgarian science and culture remained apart from the public interest. Unsatisfactory and separate library and other cultural institutions efforts were sensed in order to provide quality level of library and information servicing at the country [1].

4 Current State

The New Bulgarian University Scholar Electronic Repository is a good example in taking preliminary steps of establishing a national infrastructure for scientific information exchange. It is the first try to close the cycle, by assisting and stimulating authors in e-publishing and encouraging libraries to operationally disseminate Bulgarian scientific output. The Repository Support team professional advice, support and solutions for all aspects of information management and retrieval has played crucial role on the indexing of SER in information infrastructure projects as DART Europe e-Theses Portal and NALIS (National Academic Library and Information System – the Bulgarian Union Catalogue of Academic and Research Libraries). The first experiment is the export of 500 records to the Union Catalogue NALIS. Data is transferred with OAI-PMH protocol, where basic OAI Dublin Core standard for interoperable metadata sharing is incorporated. Generally, these are records of research articles, book chapters and monographic entities. Integration of the information massif enriches the content of the Catalogue and makes publications accessible on national level. Links to the full text of the e-prints are provided. Weekly export of data is retrieved by document status criterion - published. Next step, naturally, was export on European level, to the European Portal for e-Theses and Dissertations DART Europe. Metadata are daily updated, checking the document type field information - dissertation. Project participants should support OAI Base URL of the repository. NBU is the first Bulgarian university included in the project. For only six months meta-data of

NBU dissertations were viewed 558 times from visitors not only from Bulgaria, but also from other European countries.

This beneficial experience could be used in the future development of a national information infrastructure of institutional repositories in Bulgaria, exporting data from the operating Union Catalogue of the National Academic Library and Information System. Main objective of the „National Academic Library and Information System" project, supported by „America for Bulgaria" Foundation, is the launching of a union catalogue of the academic libraries in the country to acquire federated search - Primo Central Index, offered as an integral part. It was founded by NALIS Foundation and associated members. The Foundation reported that (http://bit.ly/1pJhGv1), recently the NALIS members are 30 Bulgarian libraries: the three founding libraries, the National Library „St. St. Cyril and Methodius", 15 university libraries and 6 academic libraries. Catalogue records are 2 497 942, and the number of performed searches per month are 25 000. Only the Bourgas Free University of all universities with repositories is not an associated member of the Foundation, but is undergoing an accession procedure.

The software source that NALIS adopted is Comprehensive Discovery and Delivery Solution of Ex Libris Company. The choice of Primo was predefined for two major reasons – it is already widely adopted in institutions in Bulgaria at no additional costs. It offers fair good indexing level and cross-referencing, allowing the implementation of library catalogues, single search in catalogues, databases and repositories, even separate collections and data objects, meta-data transfer, and control (OAI-PMH compliant, also providing the experience of selective harvesting of sets of information), and full-featured, customizable discovery layer experience (each institution can design its own view) thus offering a complete discovery solution for interested parties. We can use Primo to discover research repositories. The platform might be used as a front end while easily corresponding with open source and locally designed platforms, editing tools, applications and/or programs, etc. It also provides hostage for digital objects, which for small institutions, with restricted budgets and workforce may also be used as a platform for building an own repository. Primo services can be embedded in commonly used applications such as course management systems and institutional portals and be accessed via mobile devices.

Primo is an important stepping stone towards new information system architecture. It supports heterogeneous consortium environments with a range of consortium implementation options that can be used in environments running a variety of integrated library systems, digital repository applications, and meta-search licensing arrangements. Indexing an institutional repository in Primo Central boosts the visibility of local content. Some general requirements have to be followed:

- Content should be of scholarly interest.
- Content should contain sufficient metadata using standard formats such as Dublin Core or MODS.
- OAI-PMH harvesting compliance.

As stated earlier, it is a free alternative to investing into new projects and to achieve shared access to national research, preserved in university repositories.

5 In Conclusion

Open access is interpreted as a fundamental value in research – free exchange of ideas and knowledge between researchers all over the world. Stressing on building a repository infrastructure in Bulgaria is the first step in laying the foundations of a research environment, according modern tendencies.

The idea for introducing a model of a shared administration and standardization of policies, practices and drawing some general requirements for building and maintaining educational repositories, trying to strengthen and focus institutional efforts in creating completely new level of information and technical servicing is not new, but for a small country, just evolving in the drastically changed and continuing to change, shape of knowledge world, it counts, at least, as a step in the right direction. With this brief overview of the current situation in the country and proposing a possible solution for cooperated networked activities, we may think of furthering and building operational information infrastructure on different levels, covering different types of networks, starting with the one of the electronic archives. They already exist, face the same problems, and naturally, are rapidly progressing, because of their electronic input and technological upgrade.

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