Institutional Repositories in Japan

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Abstract. This report describes the growth of institutional repositories in Japan and NII's support projects since 2004. The characteristic features of the process were: (1) the diversity of the partner universities (2) the collaboration between universities and NII, and (3) the fast localization and installation with limited budget.

Keywords. Institutional repository, universities in Japan, open access

1 Introduction

The National Institute of Informatics (NII) was founded in April 2000 as an inter-university research institute. It not only conducts comprehensive research on informatics, but develops and provides an advanced infrastructure for disseminating scholarly information.

Its cyberscience infrastructure (CSI) initiative aims at providing industrial and social contribution as well as international cooperation on scientific research. The initiative includes the following projects:

- SINET. NII provides 100M network infrastructure shared among academic institutions in Japan.
- NAREGI. NII promotes a research grid middleware to enhance supercomputing in scientific research.
- UPKI. NII collaborates with universities to construct interuniversity public key infrastructure.
- Next-generation content services[1]. Infrastructure for scholarly information resources is under construction on the basis of existing scholarly content services that were established by collaboration between NII and universities.

In this report, we focus on the content services. They are to integrate its existing content services, which cover the disciplines of science, technology, and medicine as well as humanities and social sciences. NII-CAT provides bibliographical information which has been developed in collaboration with universities in Japan.

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[1] The project information is available at `http://www.nii.ac.jp/irp/index-e.html` (last accessed on September 4, 2006)

The portal GeNii offers an integrated search of the following databases: the citation information database (CiNii), the bibliographical information database with an associative search (Webcat Plus), the database of research projects funded by Japan Society for Promotion of Science (KAKEN), and the database of scientific databases (NII-DBR). A secure access to e-journal articles is established by collaboration between NII and the Japan Association of National University Libraries (JANUL). NII's e-journal repository (NII-REO) has archived e-journal back numbers published by Oxford university press and Springer as far back as 1849. JANUL members with the consortium contract can access the articles.

2 NII's Projects for Institutional Repositories: 2004-2005

NII launched projects for institutional repositories (IR) in 2004. They are considered components of the CSI initiative in 2005. Detailed information is available in [1].

2.1 Backgrounds: Governmental Reports on Dissemination of Academic Information

In 2003, the Subdivision on Science in the Council for Science and Technology at Ministry of Education, Culture, Sport, Science and Technology (MEXT) of Japan published a report[2] that emphasized the role of university libraries in the dissemination of academic information, in particular in the areas of humanities and social science.

Since then, the idea of an institutional repository has formed. On June 28, 2005, the MEXT Council published an interim report[3] on university libraries to explicitly state the significance of institutional repositories in the dissemination of academic information resources.

2.2 2004: Experimental Implementation

After the 2003 report, university libraries stepped forward to realize the system for disseminating scholarly information. In 2004, NII collaborated with six universities to introduce institutional repositories to Japanese universities. Those universities summarized their experiences in manuals: (1) the installation and localization of institutional repository software, (2) policy making for the entire university, and (3) copyright processing.

2.3 2005: Pilot Implementation

In 2005, NII started a collaborative experiment with 19 university libraries. The project's purpose was the deployment and coordination of institutional repositories in Japan. By June 2006, 17 institutional repositories were running; these repositories hold a total of 62,423 items (as of June 28, 2006). The list of participant universities appears in the appendix.

2.4 Problems Found in 2004 and Solved in 2005

Most of the problems are commonly observed in universities throughout the world in the launching and the operating phases of institutional repositories, such as the following problems which we faced in our activities in 2005.

Getting University-wide Support at the Launching Phase For effective operation of an institutional repository, a university-wide agreement is crucial because an institutional repository belongs to the whole university, not just to the university library.

In 2005, two approaches were taken: bottom-up and top-down. In the bottom-up approach, a university library takes the initiative to spread the idea of an institutional repository to the whole university. Hokkaido University and Chiba University took this approach. On the other hand, in the top-down approach, the decision is made first by the university management level. The University of Tokyo and Tokyo Institute of Technology took this approach.

Practical Structure In 2005, the departments in charge of running their institutional repositories, such as libraries and computing centers, used one of the three structures listed below to launch the project.

1. Special project. Hiroshima University launched its institutional repository by appointing two librarians specialized for the project.
2. Additional loads. Most universities launched institutional repositories without changing the departmental structure. The tasks were added to the ordinary routine. This approach seems difficult to maintain in the long term because it burdens the staff in charge.
3. Integrated workflow. Tasks concerning the institutional repository were integrated into the library's standard workflow. This approach has the most potential for the future. In 2005, Keio University attempted this approach.

Collection Policy Institutional repositories should emphasize the strength of each university. Collection policies, which thus reflect the diversity of the universities, are roughly classified into two categories. IRs in the first category mainly collect journal articles based on the open access (OA) movement. Hokkaido University emphasizes influences of IR on impact factors and focuses on green journal articles. IRs in the other category collect any scholarly data to make the repository into a showcase of institutional achievements. Chiba University extended its IR to accept factual data in addition to articles and e-books.

Registration and Permission Process Researchers were found to be reluctant to self-archive their achievements, while libraries tried to facilitate the process. Most universities introduced proxy registrations of items and proxy copyright permissions in 2005.

Copyright Permission JANUL collected copyright policies from publishers in Japan. A database of the policies should be launched. Nevertheless, most academic societies and publishers in Japan do not have explicit and clear copyright policies in written form. Each publisher should implement an effective legal basis of copyright contracts.

System Localization There are specific problems in Japan or other countries with 2-byte character codes. Following the experiment in 2005, various approaches were taken for choosing and constructing institutional repository systems.

- Bootstrap the system setup using an open source. This requires the least cost, but it is risky because the staff in charge can be replaced. In national universities, staff members are usually replaced in every two or three years to move to another university library. In private universities, staff members may not stay in the library but can move to other administrative offices.
- Rely on commercial vendors by purchasing a software package or commissioning the setup of open source software. This can be costly. A vendor eventually put a relatively high price tag (3.3 million JPY, or 28 thousand USD) on a localization package of DSpace in 2006.

Two tasks are imperative for the future efforts: delineating criteria for selecting the system and providing information to universities who plan to introduce institutional repositories.

3 NII's IR Project in the Promotion Phase: 2006-2007

The installment of institutional repositories to all universities in Japan requires an enormous amount of effort; there are 726 universities in Japan (87 national universities, 86 municipal universities, 553 private universities, and 4 private correspondence education colleges) in the academic year 2005. Their backgrounds are diverse and the library systems are not uniform. Nevertheless, NII stepped forward to install IR at many universities as quickly as possible.

In 2006, the CSI initiative put more emphasis on the content services. NII began working jointly with 57 universities in the construction of a next-generation scientific information resources infrastructure. The goal in the promotion phase is twofold. First, it aims to triple the number of OA repositories in Japan; the country has 19 currently functional repositories. Second, it supports the research and development activities that help facilitate the dissemination of scholarly contents.

The partner universities are expected to share their experiences and project deliverables with the whole academic community as well as the academic contents in their IRs.

The budget for the 2006 academic year amounts to 300 million JPY (2.6 million USD). The project period is from August 1, 2006 to March 31, 2008.

The 57 universities were selected from the 77 that applied for funding, replying to NII's request for proposals. Of the 57, 47 were national universities. Those with matching funds were appreciated.

The method was historically significant, since the request for proposals was the first announcement in Japan for university libraries to call for external competitive fundings. It caused cultural changes throughout university libraries; universities recognized their libraries' potential for procurations of external fundings; some universities announced the acceptance of the project proposal as a top news of their university website.

3.1 Projects Commissioned

The following projects were commissioned in 2006 to solve the problems found in 2005.

Supports for IR Management Chiba and Mie Universities are collaborating to develop a system for analyzing access statistics. The system will provide a basis of evaluation for IRs together with progress management tools.

Copyright Policy database Tsukuba University and JANUL have been working together to construct copyright policies for Japanese publishers. Unclear copyright policies and ad hoc custom for copyright processing have been apparent problems among publishers in Japan. Most publishers are small and they need information. NII has supported the academic societies by using its society village service to have their academic information disseminated. Its annual meeting for the service participants now includes information sessions on copyright policies.

Connections to Other Systems Connections between IRs and other systems inside and outside of universities have a great marketing value. Among them, the connection to a researcher's performance database is expected to alleviate the paperwork load from researchers. The Tokyo Institute of Technology is constructing a system to make it easy to register materials. An authority directory is indispensable for connecting an IR system with the faculty performance database. Nagoya University is in charge of developing this feature. Connections to open course ware (OCW) systems are also of interest.

Okayama University has constructed the *Digital Okayama Encyclopedia* with the Okayama Prefectural library which is to be integrated with the institutional repository of the university.

In 2005, some universities began providing their metadata via OAI-PMH to service providers that are attractive to users. Chiba University began to collaborate with Scirus. Google, OAIster and JuNii+ are other prospective providers. In addition, some systems were developed that accommodate with link resolvers that guide users to adequate and available contents.

Some users want to register various contents on IRs, such as fact data and multimedia contents. Metadata extension is required to accept them. Nagoya University is in charge of developing this feature.

Content Recruitment and Marketing Practices All repository construction, content extension, and utilization promotion require marketing that suits their target consumers. In 2005 during the launching phase, practices were accumulated for marketing toward librarians, library managers, and university executives, as well as toward researchers for the long term. Nevertheless, this is hard in Japan because few subject librarians exist for historical reasons. Hokkaido University has tackled the problem and made various attempts. From meeting in the library, the staff found that many researchers did not accept their invitations, so they changed their strategy: librarians now go to departmental meetings and researcher ' s offices to explain the significance of IRs.

Special Purpose IRs Some universities are developing institutional repositories for special purposes. Waseda, Hiroshima, and Nagasaki Universities are working toward institutional repositories as a platform of in-house journals and overlay journals. The Tokyo University of Foreign Language is actualizing a multilingual institutional repository which can deal with documents in Arabic as well as those in Japanese and European languages. Kyoto University is launching an institutional repository which focuses on articles in mathematics in cooperation with the Hokkaido and Tokyo Universities. Hiroshima University collaborates with the Stockholm International Peace Research Institute (SIPRI) to collect Japanese translations of articles on peace study. Education universities are also working to disseminate educational material such as classroom practices and course materials.

3.2   NII's Supports for Institutional Repositories

While partner universities carry out their projects, NII provides supports not only for partners but also for other universities in Japan that are interested in institutional repositories.

Community Enhancement and Information Exchange NII invites librarians in charge of institutional repositories to its mailing lists to share their experiences. NII also provides an information website, which bears the manuals and reports on institutional repositories in Japan, such as installation manuals and reports of library visits outside of Japan.

Moreover, NII provide translated material on institutional repositories published by organizations and institutions such as JISC and SPARC. Although most Japanese librarians can read English, it is much easier if they can access information in Japanese. The articles include: "The Case for Institutional Repositories: A SPARC Position Paper" by Raym Crow, "A Recipe for Cream of Science: Special Content Recruitment for Dutch Institutional Repositories"

by Martin Feijen and Annemiek van der Kuil, and "Concretizando o acesso livre a literatura cientifica : o repositorio institucional e a politica de auto-arquivo da Universidade do Minho" by Eloy Rodrigues.

Supports for Content Building As mentioned in the introduction, NII has built databases for academic information in collaboration with universities, which are accessible via GeNii and the other existing content services of NII. Moreover, it has also digitalized university journals. To support universities in building their initial contents for their own institutional repositories, NII has decided to release the data created by universities directly to them via FTP and CD-ROM upon request.

Workshops and Conferences NII holds workshops and conferences for various levels. Some workshops concentrate on technical issues, while some conferences are for conceptual discussions on open access, advocacy, and policy. An international conference for digital repositories is to be held on December 18-19, 2006 in Tokyo.

Training and Education Most partner universities in the 2006 project just began to introduce their own repositories at the beginning of the project period, during which time a typical partner university is given 2 million JPY (about 17,000 USD). They could not afford the DSpace commercial localization package as mentioned. NII thus made an effort to encourage the universities by presenting several models to establish the implementation of institutional repositories within such a limited budget.

NII held a workshop for system selection and implementation with open source software. The most stressed point in the workshop was that it is not wise to spend money and time on systems; content recruitment has priority. Suggested open source software included XooNIps in addition to DSpace. XooNIps is an extension of Xoops with library modules, still under further development by a joint project between Keio University and RIKEN. XooNIps already accommodates Japanese characters and offers a one-click installation package for Windows PC.

As mentioned, DSpace in Japanese universities requires localization. Hokkaido University and Kanazawa University lead a user community in Japan to exchange information on the installation and operation as a part of their commissioned project from NII.

NII has updated its 3-day training session's existing curriculum on library portals. The sessions are held twice a year as a part of NII's education and training programs for librarians, to emphasize the practical aspects of institutional repositories. The new curriculum includes a general introduction, trends in the world, case studies, system implementation, marketing strategies, copyright permission procedures, and writing a proposal for a mimic presentation for researchers and university executives.

Related Project: JuNii+ as a National Portal with Federated Search
NII is building a portal for Japanese institutional repositories, called JuNii+. It will harvest metadata from institutional repositories to provide for a federated search. While each university may make contracts with other portal services and search engines such as Google and Scirus, NII supports the national portal to allow world-wide users to access academic information created in Japan.

4 Features of the Projects and Further Problems

The diversity of the projects comes out from the spontaneity of the partner universities on the projects. The project also has dimension. The number of IRs in Japan has tripled every year since 2004. The speed of installation is getting faster little by little, since the community has exchanged practical information.

The JANUL-NII report[2] on open access (OA) showed that only 29% of researchers in national universities recognize OA, while most understand the significance when explained. Comparing to the Swan's reports ([8], [9]), those researchers in Japan behave similarly to those without knowledge of OA in the UK. Most are concerned with copyright issues; further information on the issue as well as the concept of OA is still to be distributed.

Alleviating the costs to introduce and run the repository is urgent. Information on the development and maintenance of the repository must be shared in the user communities and open source software must be distributed.

Long-term preservation and disaster plan is to be considered immediately in spite of the limited budget. Most IRs currently lack secure backup system. International collaboration is expected.

5 Conclusion

There are two aspects of the conceptual relationship between digital library at universities and the institutional repository. First, the institutional repository embraces the concept of a digital library. The information assets, particularly those accumulated in the digital library, amount to identity of the academic institution; moreover, up-to-date information of scholarly accomplishments enhances the productivity of the institution. Academic achievements are advertised via the IR to underscore the strength and competency of information management of the institution.

The second aspect is that the institutional repository is a component to realize the very idea of the digital library. The interoperability and prospective integrated search via the open access initiative protocol of metadata harvesting (OAI-PMH) emphasize the usability of the digital library.

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[2] The summary appears at `http://www.nii.ac.jp/sparc/doc/oa_report_summary_en.pdf` and the report is available at `http://www.nii.ac.jp/sparc/doc/oa_report_en.pdf` (both is last accessed on September 4, 2006).

Thus, the growth of institutional repositories embodies the idea of the digital library in the context of academia. It facilitates the dissemination of scholarly information to promote scientific research. Although this report focuses on the situation in Japan, the whole system of the dissemination of scholarly information should spread throughout the world; international collaboration and cooperation are expected to pursue the truth.

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A   Partner universities

The following list is the 57 project partners in 2006. The 19 universities in italics were also our partners in 2005.

Hokkaido Univ.	Obihiro Univ. of Agriculture and Veterinary Medicine
Asahikawa Medical College	Kitami Institute of Technology
Hirosaki Univ.	*Tohoku Univ.*
Yamagata Univ.	Fukushima Univ.
Tsukuba Univ.	Gunma Univ.
Saitama Univ.	*Chiba Univ.*
Univ. Tokyo	Tokyo Univ. of Foreign Studies
Tokyo Gakugei Univ.	*Tokyo Institute of Technology*
Ochanomizu Univ.	Hitotsubashi Univ.
Yokohama National Univ.	Niigata Univ.
Kanazawa Univ.	Shinshu Univ.
Gifu Univ.	*Nagoya Univ.*
Mie Univ.	Shiga Univ. of Medical Science
Kyoto Univ.	*Osaka Univ.*
Osaka Kyoiku Univ.	Hyogo Univ. of Teacher Education
Kobe Univ.	Kyoto Institute of Technology
Nara Univ. of Education	Nara Women's Univ.
Yamaguchi Univ.	Shimane Univ.
Okayama Univ.	*Hiroshima Univ.*
Kochi Univ.	*Kyushu Univ.*
Saga Univ.	*Nagasaki Univ.*
Kumamoto Univ.	Oita Univ.
Kagoshima Univ.	Ryukyu Univ.
JAIST	*Keio Univ.*
Toyo Univ.	Hosei Univ.
Waseda Univ.	Kanto Gakuin Univ.
Doshisha Univ.	Kansai Univ.
Kwansei Gakuin Univ.	Kochi Univ. of Technology
Ritsumeikan Asia Pacific Univ.	