New Horizons in Academic and Scholarly Communication

NII National Institutional Repositories Program

Phase 1 Report

December 2008

National Institute of Informatics

Executive Summary

1. Institutional Repositories represent a new current in the dissemination of academic and scholarly information today. An Institutional Repository ("IR") is "an internet-based server created within a university or other academic institution with the aim of harvesting, accumulating and disseminating academic and scholarly information."
2. In Japan, IRs have been growing in both number and scale since the country's first IR was established within Chiba University in 2003. At the time this report was written in September 2008, there were a total of 85 IRs in Japan.
3. OpenDOAR is a worldwide directory of IRs in which 1,220 institutions are registered. Japan has the fourth largest number of OpenDOAR registrants of any country, after the United States (308), the United Kingdom (132) and Germany (129).
4. The number of IRs in Japan grew rapidly from 2006. This growth was aided to a significant degree by CSI-commissioned projects. These projects were designed to support the creation of IRs and collaboration among universities in order to maintain and expand on the outcomes of other content-related programs conducted by the National Institute of Informatics thus far.
5. Founded on the results of the NII Institutional Repository Portal project (IRP) conducted in FY 2004, the National Institute of Informatics engaged 19 universities on a commissioned project basis from FY 2005. Project scope was expanded in FY 2006, and an open call for applications made to all national, public and private universities in Japan.
6. For this application round, two categories were formulated under which universities could seek support. "Area 1: Further expanding IRs and creating content" provided assistance in the establishment of new IRs, while "Area 2: Building new services through collaboration among IRs" aimed to yield concrete results to drive further development of IRs.

7. The numbers of institutions applying and selected for "Area 1" was as follows.

	Institutional applicants	Universities selected			Selection rate
		National	Private	Total	
FY 2006	77	47	10	57	74%
FY 2007	24	10	3	13	54%
TOTAL	101	57	13	70	69%

8. A wide variety of content has been produced in "Area 1," including papers published in institutional bulletins, those appearing in journals and those produced in academic degree programs. Data on the number of items produced is provided below.

	FY 2005 and before	FY 2006	FY 2007
Items produced		212,880	242,599
Aggregate	68,175	281,055	523,654

9. An open call for applications under "Area 2" in FY 2006 yielded project proposals from 30 universities. 22 projects were commissioned in the same year, and 14 in FY 2007.
10. This Report presents the outcomes of the first phase of commissioned projects, up to and including FY 2007.
11. A new series of CSI commissioned projects are being launched in the second phase, which began in FY 2008. There are still many issues to be addressed in relation to both IRs themselves and courses of action associated therewith. Information and communication technologies exert a major influence. With a constant awareness of these factors and in anticipation of further advancements, we trust that this Report will be put to good use.

Contents

I. The First Phase of CSI Commissioned Projects: Background and Present Status

1. From Digital Library to Institutional Repository

Many digital library initiatives were trialed in Japan from the 1990s onwards. The various results of these initiatives have served to aid the creation of today's institutional repositories (IRs). This section provides an overview of these developments, focusing on libraries in national universities.

In 1994, the Ministry of Education, Science and Culture's Science Council released a report titled "*Enriching and Enhancing the Electronic Library Functions at University Libraries (A Proposal)*". A spearhead e-library project was launched in accordance with this report in 1995, in the form of a "Digital Library System Fund" assigned to Nara Institute of Science and Technology. This was followed in 1997 by "Digital Library Advancement Funds" in University of Tsukuba, Tokyo Institute of Technology, Kyoto University, the University of Library and Information Science, and Kobe University. From 2000, a budget revision provided "Funds for Development of Digital Library Functions" to Tohoku University, Chiba University, the University of Tokyo, Tokyo Gakugei University, Hitotsubashi University, Osaka University, Hiroshima University, Kyushu University, Saga University and Kagoshima University.

Up to this point, with the exception of the University of Library and Information Science, universities' Digital Library activities had been concerned mainly with converting existing library holdings (journals, bulletins, degree theses and dissertations, rare books, classical works, reports, etc.) to electronic form. In the University of Library and Information Science, emphasis was placed on the provision of materials/information and gray literature bibliographic information and metadata.

The Ministry of Education, Culture, Sports, Science and Technology's Council for Science and Technology produced a report on *"Enhancing the Distribution Infrastructures for Scholarly Information (A Summary of the Deliberation)"* in March 2002.[1)] Referring to the spread of electronic journals and other historic changes in the forms of academic activity, this document identified the development of systematic and high-grade structures for the distribution of research information as an urgent priority and charted the state of affairs in academic information dissemination in Japan's national, public and private universities, declaring that "to enable simple and easy use of the variety of academic information generated by universities and other institutions, integrated hubs for information transmission (portals) must be established, and information disseminated in accordance with a

uniform code."

On this basis, the "Liaison Group on Improving Library Functions for Dissemination of Scholarly Information" was established in May 2002, with the 15 national universities mentioned above (the University of Library and Information Science had been integrated into University of Tsukuba) joining with the Information Division of the Research Promotion Bureau, Ministry of Education, Culture, Sports, Science and Technology to exchange ideas and formulate plans for improvement. Founded on the results of these activities, information on other national university libraries pursuing distinctive digital library initiatives was consolidated in the report on *Improving Library Functions for Dissemination of Scholarly Information*.[2)]

One of the case studies on enhancement of functions for academic information transmission cited in this report, the "Chiba University Scholarly Repository," represented the first instance of an IR in Japan.

In May 2003, the Working Group of Special Committee on Library Advancement at the Japan Association of National University Libraries released a report titled *New Trends in e-Libraries*. This report conceptualizes e-libraries at the beginning of the 21st Century as "*value-added interfaces connecting information transmitters (producers) and recipients (users)*," and presents four tasks directed to the realization of this concept: (1) using academic institutional repositories to intensify the dissemination of in-house academic information by universities, (2) advancing the digitization of materials and making use of digitized contents, (3) supporting access to information through library portals, and (4) setting up subject gateways to enable navigation to online information resources.[3)]

The trialing of various "Digital Library" initiatives in the 1990s coincided with the rise of the Internet, the spread and enhancement of e-journals, advancements in scanning technology, enrichment of metadata, and the dissemination of the OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting). Subsequently international trends including further advancements in information and communications technology, as well as rising electronic journal prices and propagation of the concept of "open access," produced an environment conducive to the creation of IRs.

2. Defining "Institutional Repository"

Many different perspectives inform discussion surrounding definitions and ideas on the nature of the institutional repository (IR).

In a position paper released by SPARC, Raym Crow positions the IR as (1) driving reform to the system of scholarly communication, with universities and libraries as its constituent elements, and (2) storing the intellectual properties of constituent members of the academic institution in question, and helping to increase the institution's visibility and status. Crow cites four characteristic elements of IRs: they "capture the original research and other intellectual property generated by an institution's constituent population active in many fields," they are involved in "collecting, preserving, and disseminating scholarly content," they are "cumulative and perpetual" – "content collected is both cumulative and maintained in perpetuity," and they must provide "interoperability and open access," in other words, ensure "no- or low-barrier access" and "be able to support interoperability in order to provide access via multiple search engines and other discovery tools."[4)]

Clifford A. Lynch defines an IR as "a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members," stating that IRs are not a substitute for "academic publication" centered on scholarly journals, but represent the creation of a new form of scholarly communication. He asserts that responsibility for stewardship of intellectual property produced by a university lies with the university itself.[5)]

Grounded in a review of conditions in Japan, Koichi Ojiro states that "an institutional repository is an internet-based server created within a university or other academic institution with the aim of harvesting, accumulating and distributing academic and scholarly information."[6)]

A report titled *Ideal Ways of Scholarly Information Infrastructures in the future (A Report)* [7)], published in March 2006, recommended the further development of IRs by university libraries. The report stated this agenda in the following terms: "It is now becoming common for research outputs and educational materials to be produced initially in electronic format by researchers and faculty members within universities. An 'institutional repository' involves the university library taking the central role in accumulating and storing these research outputs produced electronically within the university, as well as electronic renderings of older materials, digital instructional materials and other resources, and attaching metadata to them in order to make them widely available to users over the Internet. These initiatives constitute a means for further advancing educational and research activity and intensifying the level of information disseminated by universities: as such, they are being pursued on a global scale. In Japan, ventures to create institutional repositories have already begun in institutions including Chiba University, Waseda University and Hokkaido University. These methods are effective in terms of both strengthening universities' capacity to disseminate

information and discharging their accountability to the wider community, and from the perspective of providing open access to university resources."

As described above, the various standpoints of researchers, universities and research institutions, academic and scholarly information distribution systems, information users, libraries and wider society have all informed discussion of IRs to date.

3. Next-Generation Academic Information Infrastructure Project Phase 1

3.1 Overview of CSI

Japan's only general institute for academic research in the field of informatics, the National Institute of Informatics (NII) is a hub for joint research activity involving universities and other academic institutions. It functions across the dual spheres of research and project operation, in line with its mission to promote informatics research, develop state-of-the-art infrastructure for transmission of academic and scholarly information, and offer graduate-level education and cultivate human resources in the field of information technology. Its activity profile can be summarized into the concept of Cyber Science Infrastructure (CSI)[8]: the development of infrastructure to enable "the sharing, over ultrahigh-speed networks, of computers and other equipment, infrastructure software, databases and content, human resources, and research groups themselves." Development of such state-of-the-art academic information infrastructure is required as soon as possible to further promote academic research and education activities and maintain Japan's global competitiveness.

NII is engaged in the following three schemes to develop information infrastructure as a data lifeline essential to the pursuit of academic research and education.

(1) Collaboration between NII, information technology centers and other parties towards the development of academic and scholarly information networks, a common electronic authentication infrastructure for all universities in Japan, and grid computing systems.
(2) The development of next-generation academic information infrastructure essential to academic research and education, through collaboration between NII, university libraries, academic societies and other parties.
(3) The formation of a national association for informatics research attuned to the creation of future value.

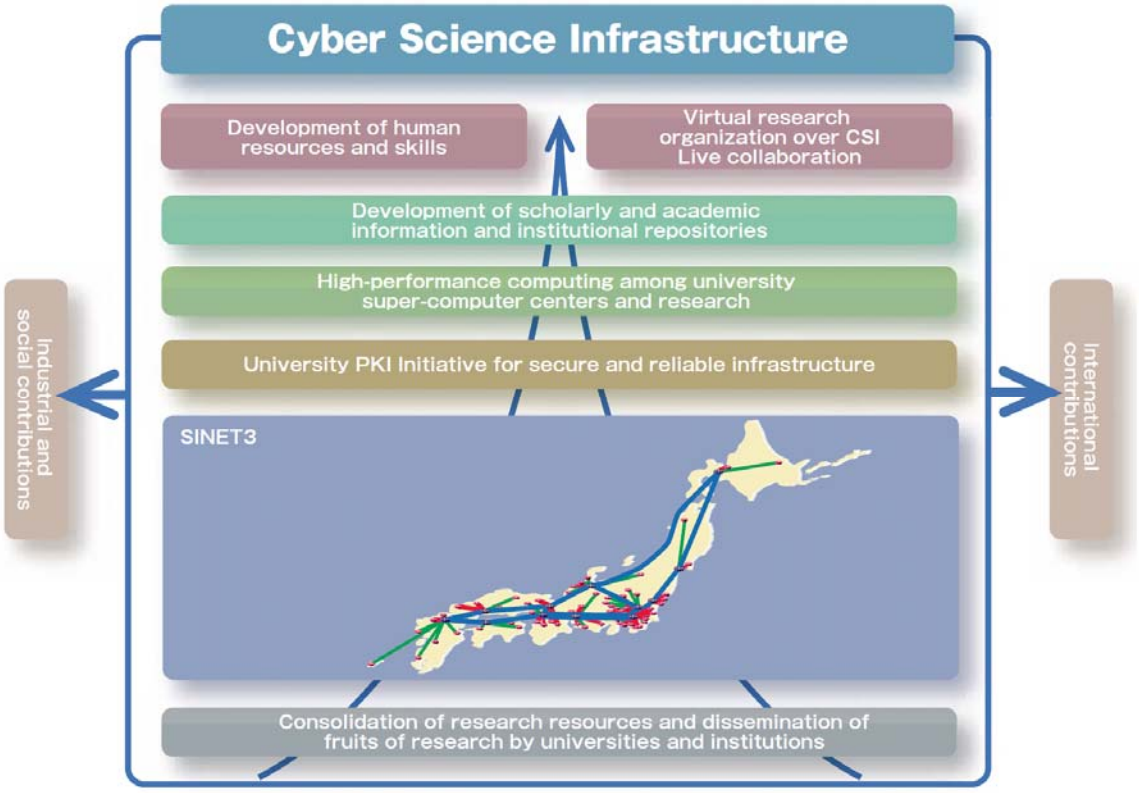


Figure 1. Cyber Science Infrastructure

NII is also developing organizational structures to facilitate infrastructure development. In close partnership and collaboration with universities, two central organizations have been established: the Organization for Science Network Operations and Coordination, and the Organization for Scientific Resources Operations and Coordination. This structure enables universities to work in unison with NII toward the development of CSI.

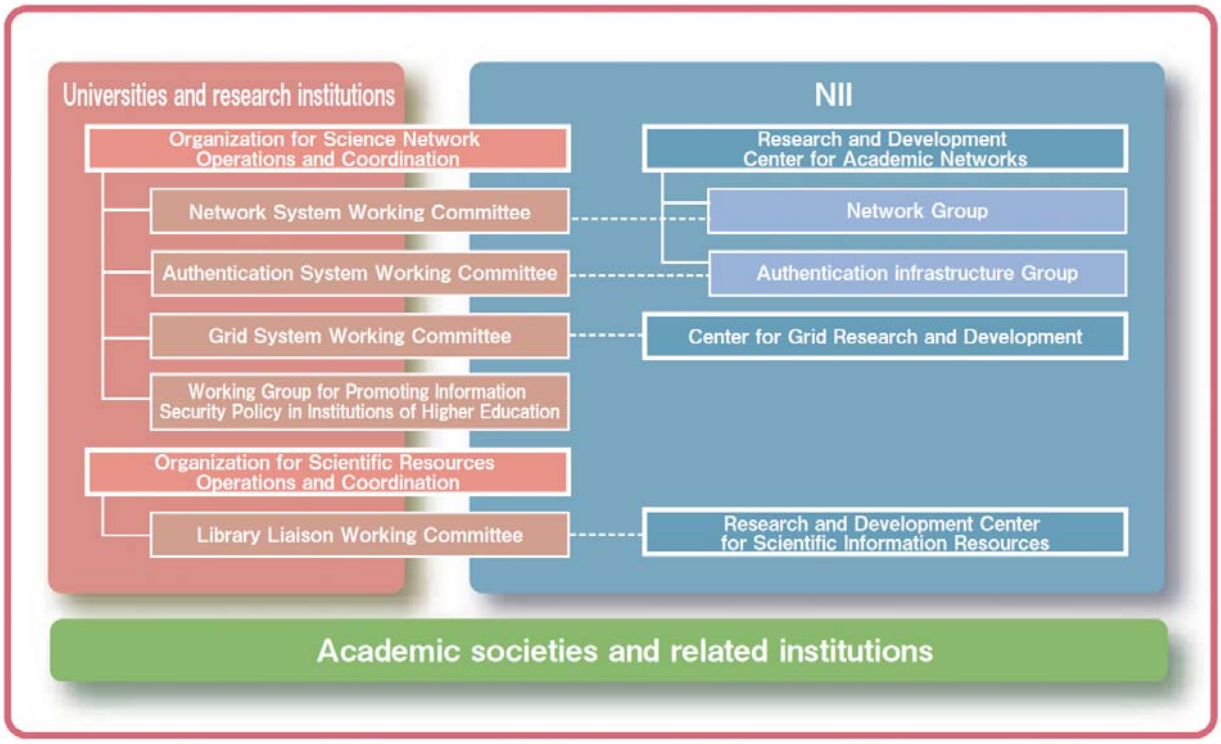


Figure 2. Framework for promoting "Cyber Science Infrastructure (CSI)" through collaboration with the academic community

3.2 Development of CSI-commissioned projects under the NII Institutional Repositories Program

As part of its work to enhance academic information infrastructure, NII is now providing support for the development of IRs and collaboration among individual universities. This program maintains and builds on the attainments of earlier content-related projects, and recognizes the fact that IRs, now being developed around the world as a new channel for dissemination of academic and scholarly information, are essential components in the provision of next-generation academic information infrastructure.

The present program has its origins in the NII Institutional Repository Portal project conducted in FY 2004. Based on the outcomes of this project, 19 universities were engaged on a commissioned project basis in FY 2005: these commissions resulted in both the creation of IRs themselves and the accumulation of experience in system development and operation. Project scope was expanded in FY 2006, and an open call for applications made to all national, public and private universities in Japan. Two categories were formulated under which universities could seek support: Area 1 "Further expanding IRs and creating content" – providing assistance in the establishment of new IRs, and Area 2 "Building new services

through collaboration among IRs" – aimed to yield concrete results to drive further development of IRs.

(1) Applications and results in Area 1: Further expanding IRs and creating content

Area 1 promotes the creation and operation of IRs that make best use of their universities' distinctive attributes. The aim is to discharge universities' social accountability by enhancing their capacity for information transmission and increasing the visibility of their educational and research activities. This Area also encompasses initiatives aimed at augmenting resources already accumulated in existing e-libraries and IRs. Applications were received from 77 universities in FY 2006, and 57 of these (47 national universities and 10 private universities; an application success rate of 74%) were selected to receive project commissions. The overall budget for Area 1 in FY 2006 was approximately 220 million yen.

An additional call for applications was made in FY 2007, yielding applications from 24 universities. 13 of these (10 national and 3 private; success rate of 54%) were selected for new project commissions. As a result, the total number of universities commissioned in FY 2007 was 70 (57 national and 13 private), with an overall budget for Area 1 of approximately 220 million yen.

(2) Applications and results in Area 2: Building new services through collaboration among IRs

Area 2 employs empirical approaches to address technical and systemic problems relating to the creation and operation of IRs, aiming to procure practical outcomes oriented to the resolution of these problems. It was envisaged that projects in this Area would tackle challenges in areas such as technology for IR creation (development of highly versatile software packages, standardization and development of methods for content version control, etc), technology to bolster dissemination capacity (development of value-added portal services, collaboration between IRs and link resolvers, etc.), systemic issues (copyright clearance, license agreements, etc.), production of IR evaluation standards, intra-organizational collaboration (linkage with performance and evaluation systems, implementation of promotional and informational campaigns, collaboration with educational and research activities, etc.), and external collaboration (international partnerships, linkage with area-specific repositories and regional repositories, linkage with repositories at other institutions, creation of jointly operated repositories under consortium frameworks, etc.). 30 universities submitted project proposals in response to the call for applications in Area 2, and 22 projects including joint projects were commissioned across a total of 37 universities. The overall budget for Area 2 in FY 2006 was approximately 60 million yen. 14 projects were commissioned

in FY 2007, with an overall budget of 40 million yen. Please refer to part III of this report for details.

(3) Proposal screening methods: refer to supporting materials 5.2 and 5.3.

Screening of proposals was conducted by multiple examiners in both Area 1 and Area 2. Each examiner used a 5-point scale to evaluate proposals against a number of different criteria. Examiners conferred to assess which proposals to accept, and the Organization for Scientific Resources Operations and Coordination then made the final determination of results.

4. Trends in countries other than Japan

This section of the report firstly includes an outline of current IR establishment figures, and a classification of IRs according to their content. It then considers projects run by organizations which assist the construction and management of IRs in countries which have established the largest number of IRs.

4.1 The current situation regarding the establishment of IRs

(1) Number of IRs being established

In recent years there has been a rapid increase in the number of IRs internationally. According to the worldwide IR directory OpenDOAR[9], there were 1,220 IRs registered as of September 2008. By country, the United States of America had the largest number of OpenDOAR registrants with 308 IRs, followed by the United Kingdom (132), Germany (129), and Japan (69). Figure 3 uses data from the Registry of Open Access Repositories (ROAR) [10]to illustrate the general change in the number of IRs being established in the top four countries. In countries other than Japan, from around 2002 there was an upward trend in the number of IRs established; however in Japan there was a rapid increase from 2006. In the space of a few years Japan became a worldwide leader in the establishment of IRs. This, of course, is a result of CSI-commissioned projects. (Note that Figure 3 refers only to IRs registered with ROAR, and so does not necessarily correspond with actual establishment figures. In the case of Japan, the dotted line represents actual establishment figures.)

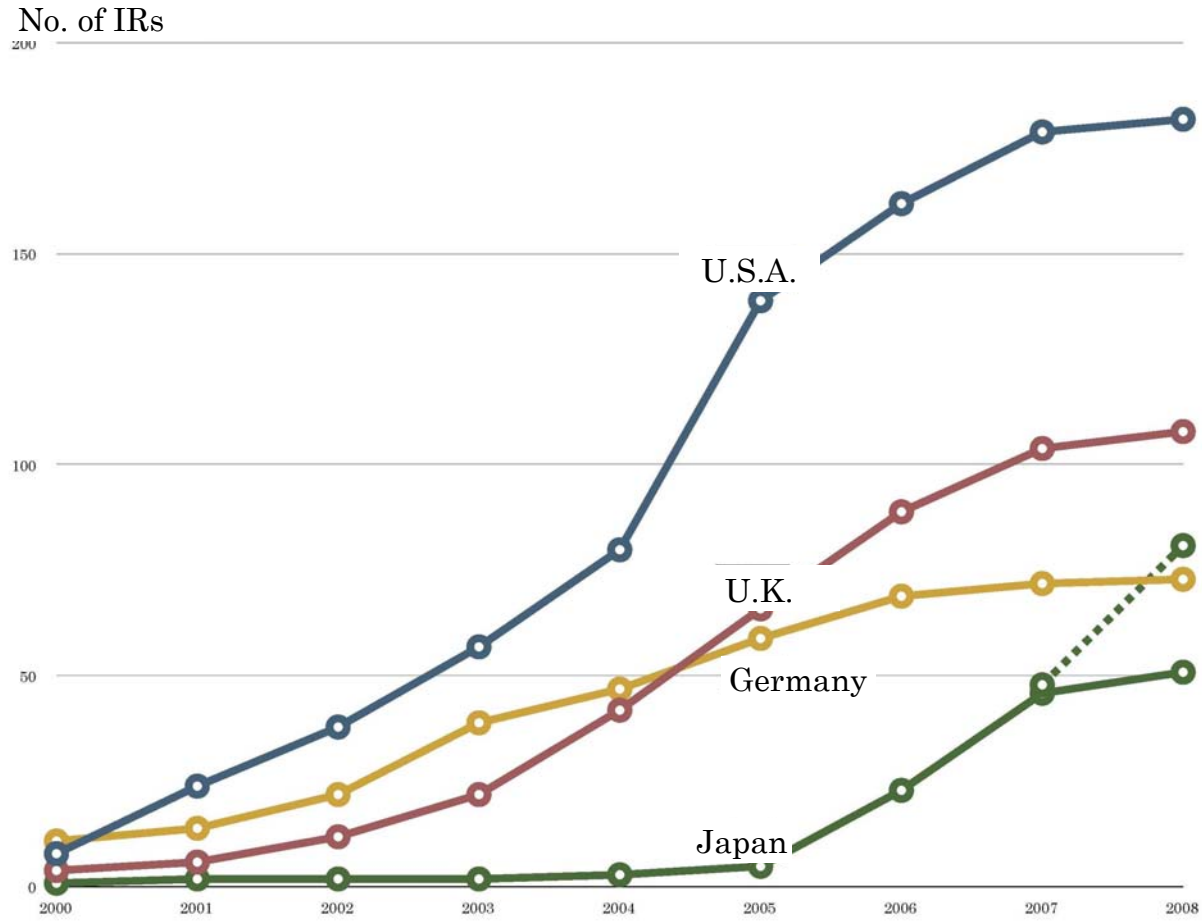


Figure 3. IR numbers in leading countries and overall trends[2)]

(2) Numbers of IRs by content type

Table 1 indicates the types of academic work included in IRs. Internationally, the majority of work consists of journal articles, theses and dissertations, unpublished reports and working papers. In recent times, more frequent mention is being made of Open Data and e-Science, but the inclusion of data and software in IRs has not yet emerged as a widespread trend. It appears at this point in time that there are many IRs which exist primarily for the purpose of collecting academic papers.

There are also some differences between countries in terms of the most common content of their IRs. The most common works registered with IRs in America are unpublished reports and working papers, and most common in Germany are theses and dissertations. Journal articles occupy an important position in all countries, however as has been shown, in Japan these articles appear mainly to be those published in university bulletins rather than scholarly journals.

Table 1. Content registered with Institutional Repositories in countries with the largest number of Institutional Repositories.

America		Germany		United Kingdom		Japan		Worldwide	
Unpublished reports & Working papers	153	Theses & Dissertations	95	Journal articles	94	Journal articles	60	Journal articles	744
Journal articles	145	Journal articles	85	Conference & Workshop papers	64	Unpublished reports & Working papers	38	Theses & Dissertations	615
Multimedia & Audiovisual materials	132	Unpublished reports & Working papers	74	Unpublished reports & Working papers	53	Theses & Dissertations	34	Unpublished reports & Working papers	549
Theses & Dissertations	114	Books, Chapters & Sections	68	Books, Chapters & Sections	40	Conference & Workshop papers	17	Conference & Workshop papers	446
Conference & Workshop papers	90	Conference & Workshop papers	62	Theses & Dissertations	39	Books, Chapters & Sections	16	Books, Chapters & Sections	377
Other special item types	78	Learning objects	26	Other special item types	22	Other special item types	15	Multimedia & Audiovisual materials	284
Books, Chapters & Sections	76	Bibliographic references	26	Multimedia & Audiovisual materials	21	Multimedia & Audiovisual materials	12	Other special item types	202
Learning objects	52	Multimedia & Audiovisual materials	25	Bibliographic references	21	Learning objects	10	Learning objects	180
Bibliographic references	52	Other special item types	11	Learning objects	13	Datasets	4	Bibliographic references	179
Datasets	27	Datasets	4	Datasets	7	Bibliographic references	3	Datasets	63
Software	12	Software	3	Software	2	Software	2	Software	27
Patents	0	Patents	2	Patents	1	Patents	0	Patents	21
	308		**129**		**132**		**69**		**1220**

Source: OpenDOAR.[1] (figures indicate the number of repositories registered)

4.2 Projects and organizations to assist with the construction and management of IRs in developed countries.

The recent increase in the number of IRs being established is of course due in part to the independent efforts of universities; however there are many cases where assistance programs also play a major role. This section of the report summarizes the IR-related projects being operated in IR leader countries other than Japan, and introduces the support activities they undertake and the research and development actually taking place.

(1) United Kingdom

Development of IRs in the United Kingdom appears to have been aided to a large degree by a series of grants provided by the Joint Information System Committee

(JISC) for the IR construction and operation, and research and development. Three programs have been implemented to date.

The first, conducted from August 2002 to October 2005, was the FAIR (Focus on Access to Institutional Repositories) programme.[11] Inspired by the vision of the Open Archive Initiative (OAI), this program promoted the development of IRs with the goal of enhancing access to all types of materials generated in UK universities. A total of 14 projects were conducted across three project clusters: e-Prints and e-Theses, museums and images, and institutional portals. Two of these projects, RoMEO and SHERPA, developed the SHERPA/RoMEO (a database of publisher and academic journal copyright policies) and OpenDOAR (a worldwide directory of IRs) services, both of which are now essential to the operation of IRs and used throughout the world.

FAIR was succeeded from 2005 by the Digital Repositories programme, the first phase of which, from 2005 through 2007, involved implementation of the Digital Repositories programme 2005-2007.[12] In the second phase, from 2007 through 2008, the Repositories and Preservation programme[13] and the Digital Repository programme[14] 2007-2008 were implemented. The aim of the research projects in the first phase was to bring together the higher education, lifelong learning and research communities to ensure that IRs serve as an effective component of the information environment in enhancing the quality of learning and research. Each individual project was allocated between 25,000 and 200,000 pounds out of a grant fund totaling between 3.5 and 4 million pounds over two years. Research and development was conducted over seven different project areas: General, Research papers, e-Theses, Research data, e-Learning, Images and Supporting and synthesis studies. Out of the 34 projects selected, the greatest number (10) is in the e-Learning area, followed by General (7) and Research data (6). Projects linking technology development and cultural issues grew in number: one example is the *Institutional Repositories and Research Assessment* project, which developed technology solutions for integration of IR-registered materials into the UK Research Assessment Exercise (RAE). The second-phase Digital Repository programme 2007-2008 adopted a different approach, establishing two major project areas of "repository interoperability" and "research data" under which a total of 21 projects were implemented.

Two notable initiatives are the Repositories Support Team (now the Repositories Research Team) and the Repository Support Project. The Repositories Research Team's work includes integration across different programmes, gathering scenarios and use cases from projects, and liaising with other domestic and overseas repositories' activities. Centered on the SHERPA project, the Repository Support Project delivers technical, organizational, managerial and advocacy-related services

to support the implementation, management and development of repositories in UK universities. These initiatives provide a support framework for subject programs on both R&D and operational fronts.

Projects are selected on an open application basis, with JISC determining thematic areas under which applications will be accepted and universities and research institutes submitting project applications in line with these areas. Detailed information is provided on each area, clearly specifying the types of projects JISC is seeking. Project applications are assessed on the basis of five clearly-stated criteria: quality of proposal and workplan, impact, partnership and dissemination, value for money, and previous experience of the project team.[15)]

(2) European Union

One well-known IR-related project encompassing the entire European region is the Digital Repository Infrastructure Vision for European Research (DRIVER).[16)17)] The first phase of this project was supported by the European Commission from June 2006 to November 2007 under the Sixth Framework Programme. Its long-term aim is to build infrastructure for a pan-European digital repository; initial objectives include the creation of a testbed, the development of a virtual network among IRs already established in the Netherlands, the UK, Germany, France and Belgium, assessment and implementation of state-of-the-art technologies for managing dispersed repositories, assessment and implementation of basic user services (searches, data gathering, profiling, and recommendation), together with validation, implementation and promotion of associated standards. The second-phase DRIVER II is being implemented from December 2007 through November 2009 under the Seventh Framework Programme. The number of participants has grown, and as of September 2008, DRIVER is supported by 152 IRs across 22 countries. In organizational terms, the establishment of the Confederation for Digital Repositories, with aim of expanding the DRIVER network, has led to expressions of interest in collaboration with DRIVER from related bodies in not only Europe but also China, India and South Africa. Content is also evolving: while the first phase focused on IR support and management of text content within repositories, material targeted for inclusion in subject-area repositories now encompasses not only research papers but also research data.

Major outputs to date include the production of the DRIVER Guidelines[18)] providing specifications for the application of individual repositories to the DRIVER network, the D-NET[11)] open source software designed to enable harvesting and collection of a variety of data held in repositories, and the DRIVER Search portal[19)] integrated search site.

(3) United States of America

The United States does not operate a national subsidy program such as those offered by JISC in the UK, but SPARC does operate workshops, international conferences and other events related to IRs, as well as furnishing information via its website. The "Repository Resources"[20] page, for example, provides a list of research papers on IR issues, information on conferences and events, and listings of directories and mailing lists, and other resources.

4.3 The need for repository R&D and publication of outcomes in anticipation of international collaboration

Although survey, research and development work on IRs is being conducted in Japan under Area 2 CSI-commissioned projects, this work differs from R&D projects in other developed nations in terms of its course of action and approach to collaboration across national borders. JISC-funded projects, for example, are developing more fundamental protocols (OAI-ORE[21], SWORD[22], etc.) in an approach to research and development not observed in Japanese projects. This gap can also be observed in the area of transnational collaboration: while SHERPA in the UK collaborates with SURF in the Netherlands, and OpenDOAR has established a partnership with Lund University in Switzerland, the only case of substantial international linkage in Japan is Hokkaido University's AIRWay project.

In comparison with IR-related projects overseas, Japanese projects lack sufficient concern with making the results of their R&D activities widely available to the general public, as opposed to simply conducting those activities. It is obligatory for all projects funded by JISC in the UK to establish web pages or websites containing detailed information on their activities, aims, objectives and methods. In addition to this information, these sites provide access to a great many research results in forms including presentation materials, research papers, and final reports, all of which must remain online for at least three years after project termination. This makes it possible for research outcomes to be shared among parties involved in IR projects not only within the UK, but in other countries as well.

In Japan's case, although the actual results of projects commissioned up to FY 2007 have been made available to the public, none of the projects offer public access to final reports or other documents providing explanation of these results. Almost all the results themselves are furnished in the Japanese language, limiting the potential for them to reach beyond stakeholders within Japan. In IR-related research papers and reports produced overseas that refer to international developments in the repository field, the CSI projects and institutional repositories

in Japan are less widely acknowledged than those in other countries. Language is undoubtedly a problem, but it is still imperative to enhance general access to information and outcomes of research projects in order to take the first steps in communicating and sharing research generated under CSI with the global IR community.

5. NII Support Schemes other than CSI-commissioned Projects

5.1 Phase 1

In addition to the CSI-commissioned projects described above, NII provides support under the three pillars of "content enhancement," "system linkage" and "community formation." Specifically, the following initiatives were carried out during phase 1.

(1) Content enhancement
- Providing content (metadata and full-text PDF files) from research bulletins rendered in digital form by NII;
- Contacting academic societies and associations producing periodicals accessible free of charge on CiNii (NII Scholarly and Academic Information Navigator), ascertaining their policies on inclusion of these periodicals in IRs, and publishing details of permission scope for each one;
- Lobbying SPARC Japan partner periodicals to adopt a "repository-friendly" policy.

(2) System linkage
- Establishing the "junii2" metadata format, an extension of Dublin Core for use with academic papers;
- Collecting IR metadata conforming with junii2 and creating an Institutional Repositories DataBase (IRDB) covering around 280,000 items (as of the end of March, 2008);
- Developing and servicing the JuNii+ IR portal (http://juniiplus.csc.nii.ac.jp/) that enables consolidated searches of metadata at each IR stored in the IRDB;
- Developing the IRDB contents analysis system (http://irdb.nii.ac.jp/analysis/).

(3) Community formation
- Hosting training for IR staff, CSI-commissioned projects debriefing and discussion meetings, and other events.

Made available on a trial basis in May 2007, JuNii+ features functionality for both regular direct-match searches, and RS searches incorporating other relevant terms. The RS search function employs the Relevance-based Superimposition model for Information Retrieval, a technology that enhances the precision of text searches.

Metadata stored in IRDB is analyzed and collated using the IRDB contents analysis system, then published online. Items subject to analysis are content growth, ratio of full text, version (author, publisher, other) distribution, language distribution, and number of IRs in Japan. The aim of making these results publicly available is twofold: to give free access to researchers in informatics and other areas to analyze the latest data and explore future paradigms for Japanese IRs; and to provide informative and persuasive material that can be used by IR personnel in individual institutions as they create and operate their IRs.

5.2 Future prospects

There were several problems with JuNii+: namely, the need to install plug-in software prior to use, the limited number of search criteria, and the fact that the interface was provided in Japanese only, making it insufficient for transmission of information beyond Japan. During FY 2008, a successor to JuNii+ is being developed to address these problems. The new service, titled JAIRO (Japanese Institutional Repositories Online), was trialed in fall 2008 and is scheduled for general release by April 2009; JuNii+ will cease to operate at this point.

As Japan's IRs move from the "creation" to the "usage" phase, it will become even more important to develop linkage between IRDB metadata and other services. Academic journal articles, papers in university bulletins and related data held by IRs which request linkage with CiNii are being made available through the CiNii search portal progressively from October 2008. Attention must also be given to reports from projects funded by government Grants-in-Aid for Scientific Research and academic degree theses: possibilities for linkage with KAKEN and doctoral dissertation databases will need to be explored from now on.

References

1) Working Group on the Infrastructures for Digital Research Information, Committee on Information, Science and Technology, Subdivision on R&D planning and Evaluation, Council for Science and Technology. *Gakujutsu jôhô no ryûtsû kiban no jujitsu ni tsuite (shingi no matome)* (Enhancing the Distribution Infrastructures for Scholarly Information (A Summary of the Deliberation)). 2002. http://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu2/toushin/020401.htm (accessed November 26, 2008).
2) Information Division, Research Promotion Bureau, Ministry of Education, Culture, Sports, Science and Technology. *Gakujutsu jôhô hasshin ni muketa daigaku toshokan kinô no kaizen ni tsuite* (Improving Library Functions for Dissemination of Scholarly Information (Report)). 2003.

http://wwwsoc.nii.ac.jp/anul/j/documents/mext/kaizen.pdf (accessed November 26, 2008).

3) Special Committee's Working Group on Library Advancement, Japan Association of National University Libraries. *Denshi toshokan no arata na chôryû: jôhô hasshinsha to riyôsha o musubu fukakachi intâfeisu* (New trends of the digital library-added value interface which connects senders to users). 2003. http://wwwsoc.nii.ac.jp/anul/j/publications/reports/74.pdf (accessed November 26, 2008).

4) Crow, Raym. "The Case for Institutional Repositories: A SPARC Position Paper." Scholarly Publishing and Academic Resources Coalition (SPARC), 2002. http://www.arl.org/bm~doc/instrepo.pdf, (accessed November 26,2008)

5) Lynch, Clifford A. "Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age." *ARL: A Bimonthly Report*, no. 226 (February 2003). http://www.arl.org/resources/pubs/br/br226/br226ir.shtml (accessed November 26, 2008).

6) Ojiro Koichi. "Gakujutsu kikan ripojitori (Scholarly insitutitional repositories)" in *Kawariyuku daigaku toshokan* (The changing face of university libraries), edited by Itsumura Hiroshi and Takeuchi Hiroya, pp.101-114. Tokyo: Keiso Shobo, 2005.

7) Working Group on Scientific Information Infrastructure, Research Environment and Infrastructure Committee, Subdivision on Science, Council for Science and Technology. *Gakujutsu jôhô no kongo no arikata ni tsuite (hôkoku)* (Ideal Ways of Scholarly Information Infrastructures in the future (A Report)). 2006.- http://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu4/toushin/06041015.htm (accessed November 26, 2008).

8) National Institute of Informatics. "*Saisentan kagaku jôhô kiban* (Cyber Science Infrastructure (CSI))." http://csi.nii.ac.jp/ (accessed November 26, 2008).

9) "OpenDOAR - Home Page - Directory of Open Access Repositories." http://www.opendoar.org/ (accessed November 26, 2008)

10) "Registry of Open Access Repositories (ROAR)." http://roar.eprints.org/ (accessed November 26, 2008)

11) Awre, Chris. "The JISC's FAIR Programme: disclosing and sharing institutional assets." *Learned Publishing* vol. 17, no. 2 (2004): 151-156.

12) "Digital Repositories programme 2005-7 : JISC." http://www.jisc.ac.uk/whatwedo/programmes/digitalrepositories2005 (accessed November 26, 2008)

13) "Repositories and Preservation programme : JISC." http://www.jisc.ac.uk/whatwedo/programmes/reppres.aspx (accessed November 26, 2008)

14) “Digital Repositories programme 2007-8 : JISC.” http://www.jisc.ac.uk/whatwedo/programmes/digitalrepositories2007.aspx (accessed November 26, 2008)
15) “Circular 3/05: Call for projects in digital repositories: JISC.” http://www.jisc.ac.uk/fundingopportunities/funding_calls/2005/04/funding_circular3_05.aspx (accessed November 26, 2008)
16) van der Graaf, Maurits and Kwame van Eijndhoven. *The European Repository Landscape: Inventory study into present type and level of OAI compliant Digital Repository activities in the EU*. Amsterdam University Press, 2004, p.144. http://dare.uva.nl/document/93725, (accessed November 26, 2008)
17) “DRIVER | Home.” http://www.driver-repository.eu/ (accessed November 26, 2008)
18) Weenink, Kasja, Leo Waaijers and Karen van Godtsenhoven. A DRIVER's Guide to European Repositories; Five studies of important Digital Repository related issues and good practices. 2008, Amsterdam University Press. 216p. http://dare.uva.nl/document/93898, (accessed November 26, 2008)
18) D-NET v1.0. http://www.driver-repository.eu/D-NET_release_v-1-0, (accessed November 26, 2008)
19) “DRIVER Search portal.” http://search.driver.research-infrastructures.eu/ (accessed November 26, 2008)
20) “Repository Resources (SPARC)” http://www.arl.org/sparc/repositories/ (accessed November 26, 2008)
21) “Open Archives Initiative Protocol - Object Exchange and Reuse.” http://www.openarchives.org/ore/ (accessed November 26, 2008)
22) “SWORD – DigiRepWiki.” http://www.ukoln.ac.uk/repositories/digirep/index/SWORD (accessed November 26, 2008)

II. CSI Project Area 1: Further Expanding IRs and Creating Content

1. Set-up

1.1 Number of commissions

The number of institutions commissioned under Area 1 has been increasing in each project year: there were 19 institutions in FY 2005, 57 in FY 2006, and 70 in FY 2007. As shown in the table below, out of this last 70 institutions, 57 were national universities and 13 were private universities – national universities account for more than 80% of the total. More than 60% of the 87 national universities in Japan are thus engaged in IR projects commissioned under CSI.

Awareness of IRs in the university library sector has grown steadily as the commissioned projects generate more tangible results. At the same time, there is more widespread acknowledgement of the need for constructive development of IRs. Moves are being made towards the creation of a common repository involving national, public and private universities, and further progress is expected from now on towards the development of repositories in public and private universities.

Table 2. Area 1 commissioned institutions

	No. of Institutions Commissioned	Classification	
		National	Private
FY 2005	19	17	2
FY 2006	57	47	10
FY 2007	70	57	13

1.2 System types

One of the major factors to consider when establishing an IR is what system (software) to use. At present, as the table below illustrates, DSpace has the lion's share in this regard. Taking into account that second-ranked NALIS-R also makes use of DSpace software, in reality almost 80% of universities have chosen this platform.

One of the factors informing this ascendancy is the fact that DSpace uses open-source software available fundamentally free of charge, giving it a major share globally. Other probable causes include the relatively advanced degree of support offered by Japanese software houses for DSpace when compared to other systems,

the provision of DSpace as part of library administration system packages, and the fact that the successive adoption of DSpace by frontrunner universities has prompted other universities to opt for it subsequently.

For universities which accord priority to usability and plan to customize systems to their own specific conditions, there is significant merit in choosing the XooNIps platform developed here in Japan, or in designing a new system in-house, as institutions such as Tokyo Institute of Technology and Chiba University have done. However, when taking into account factors such as the skill of personnel involved in the IR project, the project's continuity, and the cost of developing a system, it is clear that such approaches also present many difficulties. Universities are now producing tangible results and developing greater systems know-how: the predominance of DSpace is thus unlikely to be disturbed for some time. It is likely, however, that universities will be confronted with challenges in terms of how to deal with version updates and system changes into the future.

Table 3. Type of software used

	Software / Product Name	No. of University Users	Major Users
1	DSpace	47	Hokkaido University, The University of Tokyo, Nagoya University, Kyoto University, Kyushu University, etc.
2	NALIS-R	9	Tokyo Gakugei University, Tokyo University of Foreign Studies, Kagoshima University, University of the Ryukyus, etc.
3	eRepository	3	Osaka University, Hiroshima University, Shimane University
4	XooNIps	3	Asahikawa Medical College, Saitama University, Keio University
5	InfoLib-DBR	2	Kobe University, Yamaguchi University
6	iLisSurf e-Lib	2	Kanto Gakuin University, Doshisha University
7	GLOBALBASE	1	Toyo University
8	T2R2 System	1	Tokyo Institute of Technology
9	Original software	1	Chiba University
10	Digital Commons	1	Okayama University
11	ePrints	1	Okayama University
Total		71	(Okayama University uses two software types: thus the total is 71.)

1.3 Lead time

The number of days from initial receipt of commission to trial release averages 258 overall. This lead time has been decreasing with each year, from 276 days in FY 2005 to 255 in 2006, then to 247 in 2007. One reason for this improvement is thought to be that the accumulated know-how on system development and institutionalization in frontline universities has been shared with those that followed.

The lead time to general release averages 373 days – approximately one year. The averages in FY 2005 and FY 2006 were 379 and 410 days respectively, before a sharp drop in FY 2007 to 258 days. The high average in FY 2006 can be explained by the fact that commissioned projects were designed essentially to extend across two fiscal years, meaning that institutions could afford to engage in an extended trial release before opening their systems to the public. The reverse applied in FY 2007, when a lack of surplus time between the awarding and the termination of commissions resulted in significantly reduced lead times.

Clearly delimited commission periods mean that general releases at many institutions take place just before commissions expire at the end of the fiscal year. Even in the absence of such time constraints, however, it appears possible to institute a new IR and develop it up to the point of full release within the space of a year or thereabouts.

Table 4. Average number of days to release

	Days to Trial Release	Days to General Release
Overall	258	373
FY 2005 Commissions	276	379
FY 2006 Commissions	255	410
FY 2007 Commissions	247	258

2. Operation

2.1 Institutionalization

Institutionalization is essential to the effective operation of an IR: this includes securing approvals within the organization (university) and documenting operational policies and regulations. A general survey of internal executive-level

authorization processes and the development of written IR policies and operational regulations in institutions commissioned under this program reveals a major peak in activity in FY 2006.

In the course of FY 2006, executive-level approvals were granted in 44 universities, documentation of development policies took place in 30, and documentation of operational regulations in 33: the process of institutionalization thus progressed substantially in more than half of the 70 universities commissioned. Factors contributing to this progress include the availability of a reference source in the form of precedents from FY 2005, and the fact that it was necessary to achieve internal consensus in advance, in order to meet the application deadline for the FY 2006 round of commissions.

2.2 Organization

A variety of organizational forms are employed in the operation of IRs, reflecting the different conditions and requirements of each university. IR operational functions can be divided broadly into content development, system operation, and publicity and promotion. In some universities a single organizational unit is responsible for all these functions concurrently; in others the entire library organization is involved, while others have established dedicated working groups.

Engagement of regular university staff members in IR operation averaged 0.5 FTEs: it is clear that in the vast majority of universities, IRs are operated by one person or less.

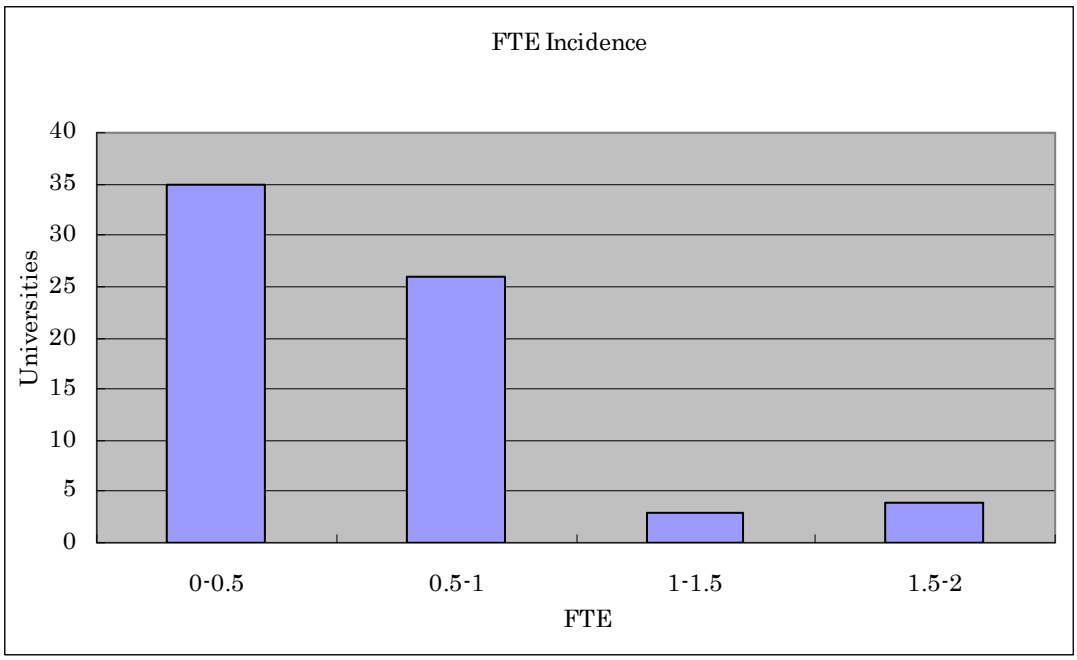


Figure 4. FTE incidence

Establishment of university-wide committees for the creation/operation of repositories became more widespread in FY 2006. Meanwhile, more than a few universities have chosen not to establish a special committee, instead entrusting IR matters to a library committee or other body. In a similar vein to "institutionalization" described in the previous section, FY 2006 was the year in which most universities developed administrative and clerical structures for the creation/operation of repositories.

2.3 Cost

The average cost of producing IR content was 2,621,000 yen overall. This average declined with each year of the commission period, from 4,481,000 yen in FY 2005 to 1,918,000 yen in FY 2006, then to 1,330,000 yen in FY 2007. There was not much difference in content production expenses between different types of institution.

Other personnel expenses averaged 1,536,000 yen overall: in line with content production expenses, this figure was lowest in FY 2007. The average for national universities was 1,599,000 yen, in contrast with 910,000 yen in private universities.

For both institutions preparing to launch IRs and for those with existing IRs, the process of optimizing of IR-related operations will raise questions regarding the extent of costs involved in inputting content for IRs, what is a reasonable scale of expenditure, what kind of work will be involved, and what actual level of fiscal resources, manpower and time will be required. At this stage, however, a sufficient grasp of these issues has not been gained. In order to address this problem a "Cost Analysis" project has been scheduled for implementation from FY2008 through FY2009: this project seeks to clarify the cost and time involved in archiving IR content by content type and processing method (i.e., in-house processing or outsourcing), and furnish data that can be used as benchmarks by each institution.

Table 5. Expenses incurred

		Content production expenses (1,000 yen units)	Other personnel expenses (1,000 yen units)
Overall		2,621	1,536
Period	FY 2005	4,481	2,072
	FY 2006	1,918	1,288
	FY 2007	1,330	740
Type	National univ.	2,574	1,599
	Private univ.	2,851	91

3. Content (Materials)

3.1 Production of IR content

The total number of materials produced has now exceeded 500,000. 68,175 materials were produced up to and including FY 2005, 212,880 in FY 2006, and 242,599 in 2007, for a cumulative total of 523,654.

Table 6. Number of materials produced

	Increase	Cumulative
FY 2005 and earlier	68,175	
FY 2006	212,880	281,055
FY 2007	242,599	523,654

In many cases, materials consist solely of metadata without full-text content: in FY 2007, 242,599 full-text materials were produced, as against 444,180 units of metadata. The breakdown by material type is presented in the table below. The graph reveals that papers published in university bulletins account for around 60% of full-text materials and around 40% of metadata.

Table 7. Number of materials produced: FY 2007

	Full-text	Metadata
Academic journal articles	42,064	126,702
Academic degree theses	9,272	25,714
Research reports	6,301	7,914
University bulletin papers	147,967	172,603
Conference papers	3,262	66,360
Conference presentation materials	763	690
Books / book chapters	732	3,145
Technical reports, working papers	2,412	2,441
Articles in general periodicals	2,235	5,486
Preprints	102	106
Learning objects	1,444	1,409
Data / databases	485	567
Software	0	1
Other	25,560	31,042
TOTAL	242,599	444,180

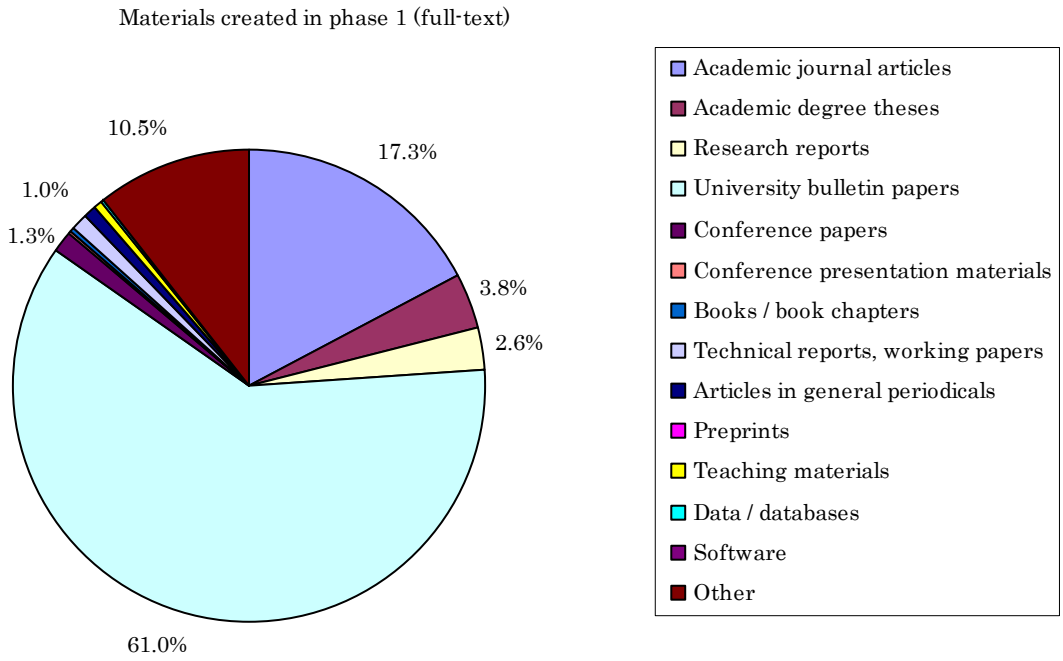


Figure 5. Materials created in phase 1 (full-text)

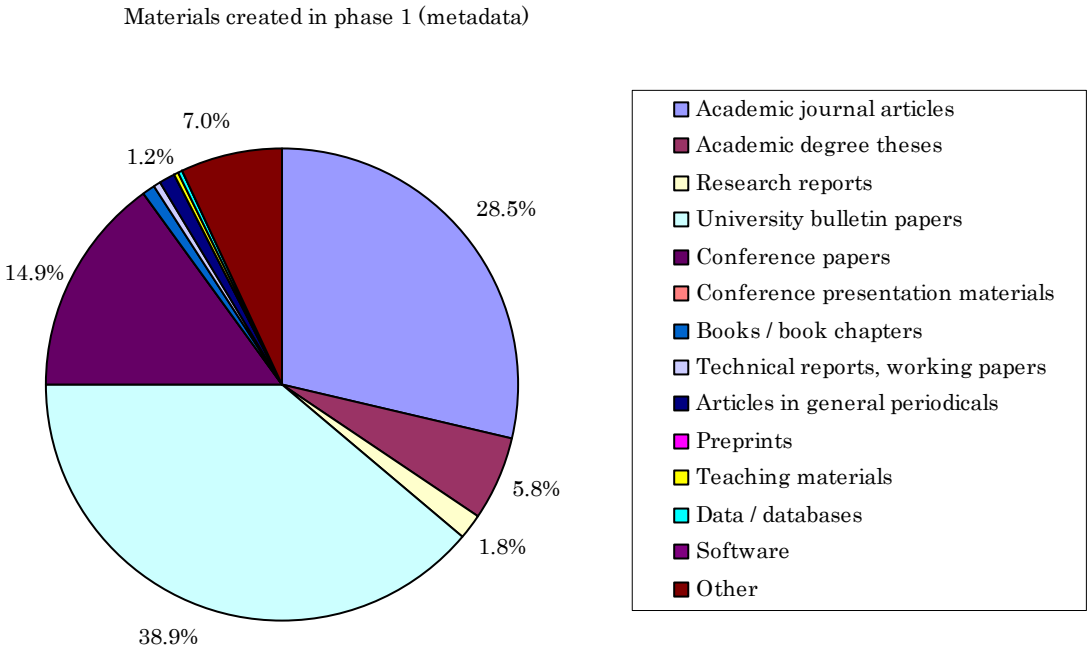


Figure 6. Materials created in phase 1 (metadata)

3.2 Targets for IR content

As the initial setup stage comes to an end, there is an observable trend in content production towards articulation of the distinctive features of each commissioned institution. The role and strategic positioning of an IR within a university is determined by where the IR's content is targeted. Several universities, for example, have opted to store scholarly papers and other academic materials in separate IR files from special collections such as images of rare books, thus achieving integration with existing e-library functions. In many universities, databases of the work of university researchers have been linked with IRs; some universities, however, are looking to go one step further, merging these two systems to create a database that integrates both listings and content to provide the foundation for university evaluation activity.

Priority content types designated for CSI-commissioned projects in FY 2008 and 2009 include academic degree theses, research reports, and papers published in university bulletins. This specification of target content can be seen as a strategy for linking IRs to pre-existing services and thereby cementing their position. In other words, by developing and enriching unique content – materials not published in e-journals – and enabling access to required materials without the need to use interlibrary duplication services, IRs can play a distinct role in the service framework for provision of academic and scholarly information, further justifying their own existence and contributing to labor-saving in administrative and clerical sectors.

Content development initially focused on quantitative expansion, employing an unsystematic approach to input of materials based on ease of inclusion. IRs now appears to have graduated from this stage to a more targeted approach to development of foundation content, informed by the aim of qualitative enhancement.

4. Prospects for the future

4.1 Continuity

The number of IRs in Japan has grown to 85 as of September 2008, and content development is progressing smoothly. It cannot be assumed, however, that this progress with continue into the future.

In terms of operational structure, each commissioned institution has devised methods of handling personnel and organizational issues in accordance with its own conditions. As stated above in "2.2 Organization," the average personnel

commitment to IR projects does not even amount to one regular employee. This is thought to be due to the fact that regular employees often take on responsibility for project development, policy formulation and other IR planning and operational work on top of their existing duties, meaning that actual hands-on tasks must be delegated to non-regular staff or outsourced. Under current conditions it is certainly not realistic to anticipate any increase in regular staff numbers: there will probably be no option other than to continue the present arrangements.

To date, this IR activity has been funded through a combination of internal budget and external sources such as funds provided under this commission program. However, it will be necessary to secure funding under ordinary internal budgets if IRs are to be maintained on an ongoing basis into the future. In order to establish the kind of presence worthy of allocation of university budget, each IR must make steady efforts to enhance its functions and materials content, and continue promoting its cause both within and outside the university; sustained lobbying at the upper echelons of the university organization is also likely to be crucial.

It is thus necessary to explore means for sustaining IRs in terms of both operational structures and funding sources.

4.2 Copyright processing

FY 2007 saw a rise in the number of universities engaging in activity related to copyright permission. Work in this area must be dealt with on a case-by-case basis, and outsourcing entails considerable expense: copyright thus becomes a bottleneck in the process of entering materials in IRs in all universities. Some of the problems are systemic, and the immediate prospects for a definitive solution are slim. At this stage, all that can be done is to enable the sharing of information and know-how among commissioned institutions, and to pursue whatever efficiency gains may be possible.

4.3 Cases of good practice

Cases of good practice in Area 1 are too numerous to list individually. As these cases have already been described in reports, discussion meetings and other forums, no specifics will be provided here. For more information, please refer to the final report of the Digital Contents Project conducted by the Committee on Scholarly Information of the Japan Association of National University Libraries, *Toward the Advancement of Digital Library Functions 3* (especially pp.19-29); and the collection of materials and papers from the "National Institute of Informatics, CSI Conference 2007 (Contents)".

A review of these materials reveals that most of the cases presented involve extra initiatives beyond the simple establishment and operation of IRs. These include customization of systems for greater functionality, and a range of creative approaches to the procurement of content. Secondhand information cannot rival direct observation, however, and the quickest way to understand the achievements of Area 1 projects is to visit the IR websites of individual universities directly. Listings of Japanese IRs are provided on sites operated by the NII Institutional Repositories Program (http://www.nii.ac.jp/irp/) and Open Access Japan (http://www.openaccessjapan.com/): please take the time to taste the many fruits of each university's efforts and judge for yourself the quality of the crop yielded in three years of commissioned projects.

III. Outcomes of CSI Project Area 2: Building new services through collaboration among IRs

1. Outline of CSI Project Area 2 (2006-2007)

CSI Project Area 2 employs empirical approaches to address technical and systemic problems relating to the creation and operation of IRs, aiming to procure practical outcomes oriented to the resolution of these problems (*Next-Generation Academic Information Infrastructure Project, Interim Report*). Its major objectives involve creation of new services through collaboration between IRs, in order to stimulate educational and research activity, and surveys, research and development to contribute to enhancements in the usability of IRs ("*Re: Call for Applications for Entrusted Projects, 2008-2009*").

The following themes were formulated in order to achieve the Area 2 project objectives (*Next-Generation Academic Information Infrastructure Project, Interim Report*).

(1) Technology for IR creation
Including development of highly versatile software packages, and standardization and development of methods for content version control.

(2) Technology to bolster dissemination capacity
Including development of value-added portal services, and collaboration between IRs and link resolvers.

(3) Systemic issues
Including copyright clearance and license agreements.

(4) Production of IR evaluation standards

(5) Intra-organizational collaboration
Linkage with performance and evaluation systems, implementation of promotional and informational campaigns, collaboration with educational and research activities.

(6) External collaboration
Including international partnerships, linkage with area-specific repositories and regional repositories, and creation of jointly operated repositories under consortium frameworks.

Applications for Area 2 CSI-commissioned projects were taken along with Area 1 in FY2006, and 30 universities filed applications/proposals. 22 of these proposals were selected as commissioned projects, involving a total of 37 universities. 7 of these projects were concluded within the 2006 fiscal year, at least as far as their Area 2 involvement was concerned; the remaining 14 project topics were carried over into FY2007 as two-year projects. In practice, there was some diversity in project content: some did not necessarily address any of the themes set, while others

covered two or more themes.

Please refer to Table 8 below for data on the topics, universities and thematic categories of projects selected under Area 2.

Table 8. List of Major Projects in Area 2 (refer to reference materials for details)

	Project Name	Universities	Thematic Category	Service Orientation	Project Website	Distribution of Outcomes, etc.	Program Continuation under CSI2
1	Access path to Institutional Resources via link resolvers	Hokkaido University, Chiba University, University of Tsukuba, Nagoya University, Kyushu University	Bolstering dissemination capacity (discovery routes)	Researcher support	http://airway.lib.hokudai.ac.jp/index_ja.html	Customization of AIRway using 1CATE and SFX	Research and development towards enhancing accessibility and discovery of information resources using Irs
2	Evaluation of Institutional Repository	Chiba University, Mie University	IR evaluation	Repository management support	http://www.ll.chiba-u.ac.jp/~joho/CSI/standardization.html	Public release of a generic analysis method	Development of infrastructure for IR evaluation
3	Society Copyright Policies in Japan	University of Tsukuba, Chiba University, Kobe University	Systemic issues (database of copyright permissions)	Repository management support	https://www.tulips.tsukuba.ac.jp/scp/	SPCJ Database	Copyright management project on open access and self-archiving
4	Digital Repository Federation	Hokkaido University, Chiba University, Kanazawa University	External collaboration (formation of IR communities)	Repository management support	http://drf.lib.hokudai.ac.jp/drf/index.php	Workshops, international conferences, mailing list, Wiki	Building a more active IR community
5	Development of a XooNIps Library module	Keio University	Technology for IR creation (IR package development)	Repository management support Researcher support	http://sourceforge.jp/projects/xoonips-library/	XooNips Library module	Initiatives towards a new repository system based on XooNips
6	A Project on Data Sharing for Achievement Database and Institutional Repository	Kanazawa University, Waseda Univeristy, Kyushu University	Intra-organizational collaboration (achievement/evaluation database)	Researcher support	http://www.lib.kanazawa-u.ac.jp/kura/achievement/	Uploading tools (for Dspace), etc.	Program for collaboration with researcher information system
7	Development of a Journal Editing and Publishing System	Waseda University, Hiroshima University, Nagasaki University	Intra-organizational collaboration (linkage with educational and research activity) and bolstering dissemination capacity	Researcher support	http://www.wul.waseda.ac.jp/ir/epubs/	Japanese-language version of OJS, review system source code	Experimental development to establish a model for collaboration between repositories and e-publishing
8	Federated Search for Institutional Academic Resources	Kyushu University	Bolstering dissemination capacity (value-added portals)	Researcher support	No site	Libros (source unreleased)	Structures of human resource evolution for sustainable Irs
9	Invoking Co-evolutional Academic Research and Education	Chiba University, Kyushu University	Intra-organizational collaboration (linkage with educational and research activity)	Researcher support	No site	None	Experimentation on data curation function extension for development of e-Science infrastructure
10	Name Authority Resolution System	Nagoya University	Technology for IR creation (development of system enhancement functions)	Researcher support	http://info.nul.nagoya-u.ac.jp/pubwiki/index.php?ANDISC	Development and planned release of API (2008 or beyond)	Development of collaborative system tools for scholarly IRs
11	Mutual Exchange of Diverse Metadata Schemes	Nagoya University	Technology for IR creation (development of system enhancement functions)	Repository management support	http://info.nul.nagoya-u.ac.jp/pubwiki/index.php?ksconv	Public release of conversion program source code	As above
12	Tokyo Tech Research Repository(T2R2) Project	Tokyo Institute of Technology	Technology for IR creation (IR package development)	Researcher support	http://t2r2.star.titech.ac.jp/	T2R2 (source unreleased)	None
13	Development of Education Subject Repository	Tokyo Gakugei University, Other national universities of education	External collaboration (subject-based repositories)	Repository management support Researcher support	https://library.u-gakugei.ac.jp/edu-rp/	Provision of harvesting functions to universities and colleges of education	Development into a subject repository in the area of education
14	User interface by correlation map of controled keywords	Hokkaido Univerisity	Bolstering dissemination capacity (development of analysis functions)	Researcher support	http://eprints.lib.hokudai.ac.jp/navi/	None	None
15	Integrated Searching Environment for Education	Mie University	Bolstering dissemination capacity (value-added portals)	Researcher support Student support	http://miuse.mie-u.ac.jp/hbs/	Isee (source unreleased)	None

The following paragraphs outline the projects by thematic category.

(1) Technology for IR creation: An archetypal example of the projects under this theme is provided by Keio University's Development of a XooNips Library Module. This is renowned as an open source module developed by the university and RIKEN, one of Japan's leading research institutes. A community of users has been formed as the system expands, and the dynamic information-sharing activities resulting from this project have yielded noteworthy results.

Tokyo Institute of Technology's project for development of a new repository system (T2R2) is in a similar vein. This is not an open source system, but it is unique in its provision of capabilities such as registration of research performance metadata alone, and data output for Grant-in-Aid for Scientific Resarch applications. Alongside repository-specific functions for storage and transmission of full-text content, this system thus provides more broad-ranging support for dissemination of research information.

Other projects applicable to the theme of Technology for IR creation are Nagoya University's two projects on Mutual Exchange of Diverse Metadata Schemes and Name Authority Resolution System, and Hokkaido University's User Interface by Correlation Map of Controled Keywords.

(2) Technology to bolster dissemination capacity: Hokkaido University's AIRway Project, which uses an OpenURL protocol to enable linkage of IR and link resolver systems, is typical of projects addressing this theme. AIRway uses a link resolver to make user-pays content from commercial databases (such as Web of Science and Scopus) available to users along with open-access content from repositories. A report on the this project's development outcomes appeared in D-Lib Magazine, an open access journal on library and information science published in the United States, and AIRway is now one of the most prominent among all Area 2 projects.

Kyushu University's Federated Search for Institutional Academic Resources and Mie University's Integrated Searching Environment for Education both involved development of systems for integrated searching of multiple electronic resources both within and outside the respective universities (Mie Unversity's project differs from Kyushu University's in that it includes external resources). They are both examples of development of value-added portal services to bolster information dissemination capacity.

(3) Systemic issues: One project addressing this theme is SCPJ, developed by the University of Tsukuba, Chiba University and Kobe University. This project involved creating a database of consent policies for inclusion of data in repositories, mainly

focusing on Japanese academic societies. Consent policies were organized and published employing the same category labels (green, blue, and yellow) as used by the SHERPA/RoMEO project funded under JISC in the UK. SCPJ represents a fundamental initiative for the support of IR operation across the board in Japan. The primary data used for SCPJ were taken from the collated results of a survey of academic societies conducted in FY2005 by the Japan Association of National University Libraries (JANUL): the project could thus be seen as a successor to this JANUL initiative.

(4) Production of IR evaluation standards: With regard to this field, the IRS (Interoperable Repository Statistics) project, implemented by the University of Southampton in the U.K. with a grant from JISC, is making progress in the development of standards and tools for use in RAEs (Research Assessment Exercises). Similar moves are being made by DRIVER in Europe to address what is seen as a common issue for all IRs. The Evaluation of Institutional Repository project pursued by researchers at Chiba and Mie Universities is informed by these European developments at the same time as using the COUNTER standards for online usage statistics of electronic resourses as a base for its pursuit of a standardized analysis method using IR access logs. Like SCPJ, this project lays important groundwork for the operation and management of IRs.

(5) Intra-organizational collaboration: Two projects relating to this theme are the Project on Data Sharing for Achievement Database and Institutional Repository at Kanazawa, Waseda and Kyushu Universities, and Chiba and Kyushu Universities' Invoking Co-evolutional Academic Research and Education project. The former seeks to develop systems linkage between IRs and databases on research output / research performance, which are used more and more as core data sources in the context of university evaluation. The latter project uses repositories, syllabi, class feedback systems and other tools to extract correlations between subjects addressed in lectures and other educational activities in order to facilitate the development of researcher communities.

These projects involve system development, and as such can be related to other themes such as bolstering dissemination capacity and technology for IR creation. They have been categorized as intra-organizational collaboration projects, however, because their primary focus is the provision of better support for research and learning through use of IRs in internal educational and research processes and the creation of cooperative connections among faculty and students.

(6) External collaboration is typified by the Digital Repository Federation project at Hokkaido, Chiba and Kanazawa Universities, and Tokyo Gakugei University's Development of Education Subject Repository. The former is already well known

among those involved in IRs, under the acronym DRF. Using mailing lists, websites, workshops, international conferences and other forms of active information-sharing and international collaboration, DRF is supporting the development of a community of IR personnel extending beyond the institutions involved in the CSI-commissioned projects.

The Education Subject Repository at Tokyo Gakugei University is a type of subject repository maintained by a consortium of universities and colleges of education – the Japan Association of National University of Education Libraries. A working group was established within the Association to develop metadata script guidelines for education-related data, and harvesting trials are being conducted with the involvement of several different universities. This was originally a one-year project for 2006 only, but a new application in FY2008 has led to its re-selection and continuation to the present day.

Other single-year projects commissioned in FY2006 included the University of Tokyo's Development of UT Repository Registration and Management System, the Development of "OneWriting & MultiOutput system" at Ochanomizu Women's University, Osaka University's Development of a Cooperative Institutional Repository for Load Reduction on Registering Information, the Project for Establishing a Repository Focused on Educational Contents of Tohoku University, Hiroshima University's Peace Studies Repositories Project (progressively dissolved into a regional associated repository), and the project on Construction and Release of Mathematical Literature Archive at Kyoto University, Hokkaido University, and the University of Tokyo. These projects yielded results in areas such as system development (The University of Tokyo), inclusion of priority content in IRs (Hiroshima, Tohoku), and digitization of academic bulletins in the field of mathematics (Kyoto/Hokkaido/Tokyo); on the basis of their content and performance record over the year, however, the primary focus of these projects was adjudged to lie in the enhancement of IR content. For this reason, it was determined to continue them in FY2007 as Area 1 CSI-commissioned projects.

2. Project outcomes and evaluation

This section outlines the process of implementation for each project and identifies the principal achievements of each one, as well as making some general assessment in light of the overall aims of Area 2. Please note that the following text consists of extracts and summaries of material contained in the *FY2007 Next-Generation Academic Information Infrastructure,– Report on Project Outcomes (Area 2)*, a document collating reports submitted to NII by each commissioned institution. Where necessitated by the issues involved, information on some projects was also obtained by telephone, e-mail and other means.

2.1 Technology for IR creation

This category includes Keio University's development of a XooNips Library module, Nagoya University's development of an author name directory and mutual exchange of diverse metadata schemes, and Tokyo Institute of Technology's development of T2R2.

2.1.1 Development of a XooNips Library Module (Keio University)

This project consists of the assessment and improvement of XooNips, a content management system developed by RIKEN that is used as a basic system for IRs, the development of additional repository functionality (i.e., XooNips Library module), the development of a user community, and incorporation with Keio University's internal databases.

XooNips is an information management software developed by a research group at RIKEN as a platform for the new discipline of neuroinformatics.

XooNips is used by combining the actual software with item types. Item types refer to additional modules that handle mapping for types of IR-listed data, metadata items, and OAI-PMH data and tags at output. Since there were insufficiencies in this area of the software, Keio teamed up with RIKEN to develop item types with metadata items by using the Metadata Object Description Standard (MODS). The result was the XooNips Library module. This development provided the fundamental functions required in an IR base software, allowing for the addition of article types, block registration modules, and the creation of webpages that are aligned with IR operations.

Version 1.0 was released in November 2006, and in addition to updates to the XooNips software, extensions are also released. It is offered as open source software with a GPL license, making it freely available for use.

Concurrent with the growing number of institutions that use the XooNips Library module, Keio and RIKEN organized a XooNips research group and set up a users group to handle user demands for additional functions and upgrades and to share information. The research group established a homepage and a mailing list and held 2 workshops in FY2007 in an effort to share information and expand the system. The scope of these activities are reaching out not only to universities but also to research institutes, significantly contributing to further expand and establish a Japanese original open source software. As of September 2008, universities that are using XooNips include Keio University, Saitama University, Sapporo Medical

University, Kinki University and Beppu University. Refer to the following links for information on the XooNips Library module and the research group.

Sourceforge.jp: http://sourceforge.jp/projects/xoonips-library/

XooNips research group: http://nijc.brain.riken.jp/xoonips/index.php?Top

Other references:

MODS: http://www.loc.gov/standards/mods/

XooNips: http://sns.ibr.neuroinf.jp/modules/xoonips/detail.php?item_id=77

On the Keio University campus, they have successfully connected the university's institutional repository, KOARA, to the Keio Researchers Information System, K-RIS. The connection was implemented by building links between the two systems using author IDs and conversion tables. With this, users can browse Keio researcher information from K-RIS and link to KOARA, or they can instantly browse an author's researcher data from the metadata in articles listed in KOARA. This has unique significance given that the research database linkup, an extended function of the institutional repository, was achieved with the open source XooNips software.

In addition to these projects, Keio University is developing and testing the following:

(1) Cross-searching of e-journal titles
Adding functionality to link to periodical titles in KOARA from the Keio e-journal search engine (EJOPAC)

(2) Link resolver connection
Connecting the MetaLib/SFX link resolver with metadata harvested from KOARA

(3) Harvesting from XooNips
Harvesting JuNii+ and OAIster at fixed intervals (as a standard feature of XooNips)

(4) Connecting to the National Institute for Informatics IMAGINE System
Testing cross searches among National Institute for Informatics IMAGINE, KOARA and KOARA-A
IMAGINE: http://imagine.bookmap.info/index.jsp

In this manner, Keio University not only develops and disseminates open source code, the university ambitiously conducts development and testing on and off campus (mainly through cross searching internal resources). These projects maintain a high level of activity with subsequent ripple effects.

However, an overview of projects (1) through (4) above including development information, concepts and specifications as well as their output must be clearly

presented on university websites. This issue applies to other research projects as well. As opposed to Area 1 projects whose objectives were the establishment of IRs and the addition of contents, Area 2 projects require universities to account for project content through information sharing and disclosure and to make efforts to disseminate achievements throughout the IR community.

2.1.2 Development of a Name Authority Resolution System and Mutual Exchange of Diverse Metadata Schemes (Nagoya University)

The aim of the Nagoya University project is to develop a uniform method for handling myriad data dispersed across information services by using the IR platform as a hub.

The project consists of the following 2 programs:

(1) Linking multiple database records to institutional repository contents by identification of author name(i.e., the development of an author name directory)
(2) Converting metadata of differing standards from various information services (i.e., databases) into standard metadata for storage in the IR (i.e., mutual exchange of diverse metadata schemes)

The Name Authority Resolution System developed under program (1) does not apply to just one system (i.e., the IR), but links the records of multiple, differing systems with keys, that is, author names identified after ambiguities have been resolved. For this, Nagoya University developed the information-rich author name knowledge base required to identify and redirect author names. This is known as the Author Name Directory. A web service was created that functions as follows: when a request containing an author name is made to the knowledge base, the author name is identified and redirected with the appropriate parameters to the required linked URL.

The authority system links 2 campus databases, the NAGOYA Repository and the faculty profiles (the Nagoya University Faculty publications database), to the JST ReaD (research information database). A button linking to the authority system has been incorporated into the NAGOYA Repository making researcher publications across multiple databases easily viewable from the repository. The authority does not rely on any specific system and can be applied in other institutions.

Mutual exchange of diverse metadata schemes refers to a program to mutually exchange metadata of different formats across several services in order to handle diverse data uniformly across multiple systems. Nagoya University developed this program as a command-line application to exchange Electronic Theses and

Dissertations Metadata Standard (ETDMS), open-source software metadata called Learning Object Metadata (LOM) and other types of metadata. The source code is openly available.

Both projects use keys, either authors or metadata, to easily connect diverse resources, and they could possibly be used as part of the Integration and Presentation of Diverse Information Resources project supervised by Kyushu University. Neither program relies on a specific system, so they can be used in other institutions' repositories. The potential for ripple effect is commendable.

However, command-line execution means the programs are not entirely user-friendly. GUI development and rollout efforts are expected. As with the Keio University project, it is important for Nagoya University to present an outline of the project, including the development systems concept and application methods for other institutions' repositories, in an easy to understand manner together with a clear forward vision. Insofar as this is a major development, greater efforts to disseminate information and promote widespread use will be important for the future of IRs.

The Name Authority Resolution System can be accessed from the following link:
Name Authority Resolution System: http://info.nul.nagoya-u.ac.jp/resolve/search/
Nagoya University Faculty Profile: http://kenpro.mynu.jp:8001/scripts/websearch/

Programs are publicly available at the following link:
NAGOYA Repository Lab: ttp://info.nul.nagoya-u.ac.jp/pubwiki/index.php?ksconv

An outline of the project was presented as follows:
Tanahashi Koreyuki, Yamamoto Tetsuya, Kajita Kenji and Jiromaru Akira. "Development of the Name Authority Resolution System," *Annals of Nagoya University Library Studies* No. 6 (March 2007).
Yamamoto Tetsuya. "Developing a General-Purposed Data Converting Framework," idem.

Both articles are available in full-text versions:
http://libst.nul.nagoya-u.ac.jp/report/f_report.html

2.1.3 Development of the Tokyo Tech Research Repository (T2R2) (Tokyo Institute of Technology)

Tokyo Institute of Technology developed its T2R2 repository software based on an original concept, and began university-wide operation on August 31st, 2007.

The original T2R2 software can comprehensively accumulate, manage and disseminate research information as well as manage accumulated achievement data. For this reason, it comes equipped with the following features: (1) automatic web page creation for Achievement Lists, (2) output of application forms for Grants-in-Aid for Scientific Research, and (3) automatic loading of metadata from analyzed PDF files, as a means of input support. These functions can be used to transmit large batches of data to JST's ReaD system and to create internal Achievement Lists.

In this manner, T2R2 accumulates metadata not only for scholarly papers that can be made publicly available, but for all papers that university researchers write. By providing researchers with myriad user functions, the Tokyo Tech system aims not only to gather papers and make them public, but also to serve as total management system for researcher output.

In light of these objectives and functions, the registration of metadata only is clearly stated as a part of repository policy. As a result, the unique feature of this program is the exceptional increase in metadata numbers after papers are made publicly available. This phenomenon resembles the trend in British repositories to register only metadata in order to implement Research Assessment Exercises (RAE).

This project is considered unique in that T2R2 is utilized as a researcher information system, effectively linking researcher convenience to repository usage. Researchers are already calling for an English version, and the future development of this project – both as a means for researchers to disseminate their own research and as a response to their needs for research information management – is sure to garner attention.

On the other hand, when one looks at guaranteeing external researchers and users access to full-text content, the question arises as to the extent to which the system's functions can be linked to incentives for self-archiving full-text papers, not stopping merely at the secondary information management of metadata. This is the key to the success or failure as an IR.

T2R2: http://t2r2.star.titech.ac.jp/

2.2 Technology to bolster dissemination capacity

Category 2, Technology to Bolster Dissemination Capacity, is comprised of the following 3 projects: the Hokkaido University-led AIRway project (development of an Access Path to Institutional Resources via Link Resolvers), Kyushu University's development of Federated Search for Institutional Academic Resources, and Mie University's development of the Integrated Searching Environment for Education.

2.2.1 AIRway Project (Hokkaido University et al)

The development of a link resolver compatible system by Hokkaido University, Chiba University, University of Tsukuba, Nagoya University and Kyushu University (the project name was changed to "Access Path to Institutional Resources via Link Resolvers" in FY2007) was formerly named "Research and Development Project for Navigation of Open Access Literature" (FY2007 Project Report, Area 2), which sought to develop a navigation system for IRs via link resolvers. OCLC Informatics has been selected as a joint development partner. OCLC Informatics, one branch of the Online Computer Library Center, is a vendor of the link resolver system 1 CATE (Now called, OCLC WorldCat LinkManager)

Using the OpenURL protocol for guiding end users to the appropriate copy (i.e., the document that the user requires), link resolvers are electronic resource navigation systems to guide users from the resource to the target. Resources refer to the contents of Web of Science, Scopus, CiNii and other document databases. Targets may include OPAC and other search services for checking collections or paid contract e-journals and printed media. Open access journals and full-text articles in CiNii can now be navigated. In other words, resources refer mainly to searchable document databases, and targets can be thought of as full-text content.

The following two methods for systemic linkage with the repository were considered.

(1) Resolvers possess knowledge bases (i.e., metadata DBs) related to the institutional repository. When an OpenURL query comes from a resource, they read the knowledge bases to guide users to content;
(2) The resolver receives the query from the resource and passes the OpenURL query to the repository to identify content.

The latter method was chosen on the basis of its feasibility (i.e., ease of implementation for the resolver vendor).

AIRway, the Access path to Institutional Repositories via link resolvers, is a database that receives the content ID query from resolver and functions to navigate the user to the appropriate full-text content in the repository. Queries from the resolver must be transmitted to the AIRway server in line with the OpenURL standard and a few local rules. With local customization of these queries, the location of full-text content can be confirmed from any resolver.

AIRway regularly harvests data from participating universities, which as of September 17th, 2008 include the following: Hokkaido University, Otaru University of Commerce, Muroran Institute of Technology, University of Tsukuba, Chiba

University, Kanazawa University, Nagoya University, Mie University, Kyoto University, Hiroshima University, Kyushu University and Cranfield University in the UK. If there is content in these universities' holdings that is indexed to the above mentioned targets, the resolver will present the location directly to the user via a secondary window. The only condition for data harvesting is that metadata of the citation information for documents in each university's institutional repository complies with JuNii+.

When considering the growth in the implementation of link resolvers in Japan, it is expected that more universities participate in the AIRway project to create an environment in which more users can access IR content through widely used access paths (secondary source databases). This would also be an effective public relations strategy to boost visibility of the IRs themselves.

AIRway is a unique idea with wide-ranging capabilities. Increased international participation in this outstanding project should spur its development. The team's initiative in jointly authoring an article on the project for publication in the American open access journal *D-Lib Magazine* and spreading the word throughout the global library community is also commendable. This project seems to anticipate the issue of internationalizing Japan's librarians.

For more information on the AIRway Project, please refer to the following literature.
AIRway Project: http://airway.lib.hokudai.ac.jp/
Shigeki Sugita, Kunie Horikoshi, Masako Suzuki, Shin Kataoka, E.S.Hellman, Kenji Suzuki. "Linking Service to Open Access Repositories." *D-Lib Magazine*, Vol.13, No.3/4 (March/April 2007) (http://dx.doi.org/10.1045/march2007-sugita)

2.2.2 Federated Search for Institutional Academic Resources (Kyushu University)

The Kyushu University project is a program to develop integrated search portal functions for multiple databases including its own IR. At the same time, the project is tasked with creating a system for developing a community of researchers that use the portal for their research. In the context of researcher community development, the project shares a common vision with the Chiba University project in Section 2.5.2 ("Invoking Co-evolutional Academic Research and Education").

Universities possess a variety of information other than documents. Not all of this is available with standardized metadata. In additions, users must search through each individual information source and database.

Given this decentralized information environment, the aim of this project is to use

text searches with few restrictions, without relying on standard metadata (input), to streamline diverse academic resources. IRs are not merely text: the global trend is for them to serve as "Comprehensive Academic Resource Databases" that include laboratory data and supporting materials (FY2007 CSI-commissioned project report, Area 2). This project attempts to propose the Japanese model for IR amidst this trend.

The first order of business for the project was the verification of full-text search engines. It compared SIGMA, Namazu, and JiroSearch, and after verifying text conversion, indexing and search times, JiroSearch's core system, Lucene, was chosen. The following 3 systems are subject to the comprehensive search:

(1) Social Network Service (SNS)
(2) Version Management System (online version)
(3) Kyushu University Institutional Repository (QIR)

Kyushu University developed Libros as an integrated search interface. The interface provides an academic database model that comprehensively references works in progress (Version Management System), complete articles (QIR) and comments and advice on the research process (SNS). Using the authorization and approval function of the SNS community, the team conceived that it could contribute to communication among research labs and project teams and provide information in response to user requests. This indicates the potential for collaborationwith Chiba University's Invoking Co-evolutional Academic Research and Education project.

Regarding the features of this project, text data (i.e., metadata) is first extracted from each system and arranged in a database. Searching is conducted through this database, thus realizing a federated search function that does not rely on the standardization of the individual systems or metadata. The project can also be commended for its concept of integrating institutional repositories and other databases into the research cycle to expand the usability of the repository and for presenting one model for cross-referencing internal resources.

On the other hand, it is vital going forward to promote the system's usage to researchers and to receive their feedback in order to assess system viability and the concept of a Japanese IR model. As with other system development projects, it is essential to disclose user (i.e., university faculty member) feedback externally. Utilizing this feedback to diversify target information resources will most likely be another issue.

Please refer to the following link for information on Libros:
http://libra.unknownlabo.com/

2.2.3 Integrated Searching Environment for Education (Mie University)

With this project, Mie University has developed an integrated search system for myriad academic resources accumulated and distributed throughout Japan and the world. Mie University is creating an academic environment to support the entire spectrum of access pathways for discovering, obtaining and using academic information by realizing an integrated search of institutional repositories, databases, and search engines.

This project examines institutional repository usability in the context of learning, education and research with the aim of clarifying the necessary conditions for functions and content to promote the effective use of institutional repositories.

In particular, Mie University has developed an integrated search prototype known as ISee (Integrated Searching Environment for Education) which allows for the cross-searching of the following content.

(1) Foreign document databases (PubMed, CINAHL)
(2) Japanese document databases (MAGAZINEPLUS, IchushiWeb (Japan Medical Abstracts Society))
(3) E-journals (Science Direct, Ingenta Connect etc.)
(4) Collection indices (Mie University OPAC, NACSIS-Webcat etc.)
(5) Article search services (NikkeiBP, Nikkei Telecon etc.)

Users may select the databases they wish to search. Paid databases are automatically excluded from external access.

In addition to this development, the university has placed the ISee integrated search button on the top page of the Mie University Course Management System, Moodle, as part of its policy to utilize IR content for educational activities. Another function of the system allows users to define keywords in advance for each lecture and utilize ISee to display search results based on those keywords, automatically generating lists of documents related to their lectures.

Miuse, the Mie University institutional repository, focuses on educational content. Using the results of this project, it is important for the project team to verify the usability of the content for teaching and learning and enhance Miuse content by incorporating feedback from students and faculty members.

Mie University's project differs from the Kyushu University project in that it includes external resources in its searches, thus making for an original project. Since both of these projects can serve as a model for the development of

cross-searching that includes IR content, Mie University should make public its successful development concept for integrated search, and an overview of search methods, as Kyushu University did, in order to promote information sharing.

Please refer to the following links for ISee and Moodle:
ISee: http://miuse.mie-u.ac.jp/hbs/
Moodle: http://portal.mie-u.ac.jp/moodle07/

2.3 Systemic issues

2.3.1 SCPJ (Society Copyright Policies in Japan) Project (University of Tsukuba, Chiba University, Kobe University)

The SCPJ database, created and maintained jointly by University of Tsukuba, Chiba University, and Kobe University, is based on the data collected through a survey conducted in FY2005 by the Japan Association of National University Libraries (JANUL) Committee on Scholarly Information, as part of the Digital Contents Project. In the FY2005 survey targeting the 1,731 academic societies on the Directory of Academic Societies (2004 – 2006), 766 societies replied (response rate: 46%). To complement data obtained in this survey, the SCPJ Project conducted two additional surveys as outlined below.

One survey was sent to the 964 societies that did not reply to the FY2005 survey: 171 responses were received (response rate: 17.7%). Another survey was conducted on 595 societies that chose not to disclose results in the FY2005 survey: 181 societies replied to this survey (response rate: 30.4%). The data from these surveys serves as the foundation on which SCPJ was built.

The CSI-commissioned project started in FY2007 continues with the following surveys and activities.

(1) Working with non-responding societies on publicizing consent policies;
(2) Conducting surveys of societies that have copyright policies available on their society homepages but that are not registered with SCPJ;
(3) Contacting societies that have not made decisions on document disclosure in repositories;
(4) Conducting surveys of non-responding and new societies.

As a result of this continuing research, there are now 1,815 cases on file, of which 39 societies are “Green” (i.e., consent granted for archiving post-prints and pre-prints in IRs), and 194 societies are “Blue” (i.e., consent granted for archiving post-prints only). The success of IR projects hinges on increasing the number of consenting societies, and on the number of publishing consents the team can obtain from

researchers. The SCPJ Project will have a major impact on making repositories more efficient and on furthering open access to Japanese documents.

The project team has strived to continue its research and to enhance the data functions of the database with the following measures.

First, the website was redesigned in July 2006, and functionality was added to allow searches by journal name. In October of the same year, data from the List of Society Copyright Policies regarding NII-ELS Content was incorporated, and in November data from the SPARC Japan Partners 2008 was added. Data from the 2007-09 Directory of Academic Societies was also added. By enriching the data, the average number of hits to the SCPJ homepage jumped to 2,600 per month, and with this, the project team was able to provide numerical data for their contribution to boosting the efficiency of the work of repository operators.

The team has strived to publicize its project in addition to conducting this kind of research.

First, they made SCPJ Project posters and distributed them at the Library Fair and Forum held on November 9th, 2006. At the 3rd DRF Workshop (DRF3) held during the Forum, the project team participated in a panel discussion alongside participants from academic societies and publishers, including the Chemical Society of Japan, Springer Japan, Elsevier Japan and the British Physical Society, to publicize SCPJ.

In January 2007, university participants in the DRF and the project team visited the SHERPA/RoMEO group at Nottingham University where they gave a presentation on SCPJ and shared information. In that same month, the team gave a poster exhibition at the DRF International Conference (DRFIC2008) held at Osaka University and exchanged information with one of the presenters from overseas, Ms. Paula Callan of QUT (Queensland University of Technology), on the OAK Law Project, a similar project in Australia. In this manner, the team also proactively cooperates with international partners.

SCPJ activities are essentially altruistic, and its contributions to Japan's repository community above and beyond the scope of the CSI-commissioned project have been great. As the universities participating in the CSI-commissioned project continue to expand the database, while obtaining consent to register documents in the institutional repository though information collection and publicity, they are also expected to provide positive support to the SCPJ project.

SCPJ has since been designated as an integral part of DRF activities for 2008 and

beyond. If the project team can gain the support of other institutions as part of a consortium such as DRF, it will make it easier for them to continue in their altruistic endeavor. In that sense, it is necessary for the entire Japanese repository community to support SCPJ as a fundamental and core program of CSI-commissioned projects. Refer the following link for information on SCPJ.

SCPJ: https://www.tulips.tsukuba.ac.jp/scpj/

Tomita Kenichi, Saito Mika, Hirata Kan. "SCPJ," *Senmon Toshokan* No. 228, pp.45-49.

2.4 Creating evaluation standards for institutional repositories

2.4.1 Institutional Repository Evaluation Systems (Chiba University, Mie University)

This project developed institutional repository evaluation standards for the following areas.

(1) Improvements for IR architecture and operation
(2) Activities to promote content collection and use
(3) Input
(4) Output

Evaluation indicators for the 4 areas are listed below.

(1) Improvements for IR architecture and operation
- Existence of university executive-level approval and documentation of IR development policies
- Existence of documented repository operational regulations
- Existence of an established university-wide committee on repository creation / operation
- Status of administrative organizations concerning repository creation / operation

(2) Activities to promote content collection and use
- Events to commemorate repository establishment
- Internal information sessions (meetings and/or training) / Number of informational activities for individual faculty members
- Reports and presentations at international workshops / registration with repository directories
- Status of search engine registration

(3) Input
- Number and types of stored content
- Number of content items added annually
- Existence of an overlay journal
- Number of content items created

- Number and percentage of faculty members that have registered content in the repository

(4) Output
- Number of sessions
- Number of metadata displays
- Number of downloads
- Number of sessions per referrer
- Number of download for most used content

Of these, indicators in the first 3 categories have been adopted as is for the evaluation of CSI Area 1 university repositories.

The Output Indicators in (4) are based on the institutional repository access logs. In FY2006, a preliminary analysis was conducted using the Chiba University CURATOR access log. Since each university uses different log designs and applications, data processing methods must be revised. In addition, it was found that there has not been sufficient standardization among the types of access mapping software in use: this has made a simple cross comparison impossible. For this reason, a conceptual review was conducted, and a consensus was reached that the following processes to refine logs, that is, to standardize log data, were needed.
Processes to Refine Logs

(1) Exclude requests that did not connect to usage (Use HTTP status code)
(2) Exclude access from crawlers, robots and spamware that do not relate directly to usage
(3) Exclude fragmented files that compose a webpage from the file count
(4) Control successive multiple requests (i.e., double clicking) from the same user
(5) Eliminate internal usage for administrative purposes

To carry out these processes, it was agreed that an analysis would be conducted in which an originally-developed access filter would refine items with HTTP status code and eliminate duplicate access, after which AWStats freeware would be used to exclude visits by robots and crawlers and analyze by file types.

In January 2008, the Institutional Repository Output Assessment Workshop was held at the National Institute of Informatics where the 14 participating universities were requested to provide their log files. In the end, 11 agreed. After analyzing these logs, quantitative data on the number of hits, PDF file downloads, number of hits by access point, access routes and frequently used content was obtained.

These standardized quantitative data make it possible to conduct a comparison of cross-repository use (i.e., output) and a multi-angled examination and analysis of repository usability. However, only 2 of the 11 universities had saved their entire

logs, revealing a variation in the need to actually collect data and the use of log rotation and other processing technologies. Activities to raise awareness of the importance of collecting, administering and analyzing logs will be necessary as will the adoption of standard evaluation indicators among the repository community.

In order to compare multiple institutional repositories, one possible method is to collect log files after deciding upon a standard log file design that presumes metadata storage. The Los Alamos National Laboratory's MESUR Project proposed expanding and using OpenURL ContextObject (Z39.88-2004), and it appears that this method will be employed in the ongoing IRStats Project at Southampton University in the UK.

Global trends such as these should be kept in mind by those involved in this project as well. The project team will be expected to standardize log analysis methods that allow for analysis of repositories from many different angles and to disclose and share its statistical tools. In addition, the team should also examine content usage status and repository usability by way of log analysis.

Background on the analytical methods employed in this project can be found in "Analyzing IR Access Data: Methodologies and Trends" on p. 50 (Topic 1) and in the literature below.

Sato Yoshinori. "Kikan ripojitori no autoputto bunseki (Analysis of institutional repository output)." FY2007 CSI Conference 2007 (Contents) Presentation Materials.
(http://www.nii.ac.jp/irp/event/2008/debrief/pdf/3-01_tohokugakuindai.pdf)
Sato Yoshinori. "Kikan ripojitori no riyô tôkei no yukue (The future of institutional repository usage statistics)." CA1666 Current Awareness No.296.
(http://current.ndl.go.jp/ca1666)
Chiba University Library. "Kikan ripojitori no autoputto bunseki (Analysis of institutional repository output)." (Pre-print)

2.5 Intra-organizational collaboration

There are four projects that form a part of the theme, (5) Intra-organizational Collaboration; the Development of a Journal Editing and Publishing System by Waseda University, Hiroshima University and Nagasaki University; Invoking Co-evolutional Academic Research and Education by Chiba University and Kyushu University; the Project on Data Sharing for Achievement Database and Institutional Repository by Kanazawa University, Waseda University and Kyushu University; and the User Interface by Correlation Map of Controled Keywords by Hokkaido University. While these all fall into the category of intra-organizational

collaboration they also encompass an aspect of construction technology for bolstering dissemination capacity.

2.5.1 Development of a Journal Editing and Publishing System（Waseda University, Hiroshima University, Nagasaki University）

The "Development of a Journal Editing and Publishing System" project by the three universities of Waseda, Hiroshima and Nagasaki aims to create a Japanese language version of the Open Journal System (OJS) developed by the Public Knowledge Project (PKP) in Canada and made available as an open source. In addition, the project aims to develop a new, unique review and refereeing system for the Japanese environment.

As is well known, OJS was developed by PKP at Simon Fraser University in Canada as a key open source software. It provides all functions necessary for the publication of digital journals and their distribution in open access environments, including functions for configuring submission requirements and review processes, online submission and management of all content, subscription modules with delayed open access options, end user reading tools, e-mail notification and commenting ability for readers, and OAI-PMH harvesting and robot search registration. Presently over 1,400 journals are published worldwide using OJS.

The Japanese version of OJS created by this project is now available by downloading from the PKP site. A journal review system for the Japanese environment was also developed in partnership with a domestic vendor, and the source code has been made public.

Parallel to this, a system which sends a notification by email to the repository manager when OJS contents are saved in the repository was also developed. Originally, the project concept involved a strategy to facilitate the process of archiving content accumulated in OJS journals by providing OJS open access publishing functions to in-house publications and promoting collaboration with researchers. Therefore it can be said that the Japanese version OJS was developed to complement the strategy for facilitating content collection. Waseda University Library Journal "*Tsuta*" was chosen as the trial platform for investigating the results of this development. The project team will also collaborate with the newly-established Japanese Association for the Contemporary and Applied Philosophy, which is planning to utilize OJS for the creation of a new academic society journal, to continue experimental investigations into OJS use with the aim of expanding the possible applications of OJS in this country.

The adoption of a system such as OJS to launch open access journals has great

potential as a major step towards the promotion of the open access concept. Overseas, the JISC project RIOJA, a combination of arXiv and OJS, is an attempt to supplement the review and refereeing function missing from arXiv (demonstration journals are due to be published). This promises being one effective method that Japanese repository managers and libraries can use to support dissemination of research information, particularly in areas and media such as small-medium academic societies and journals, where digitalization seems to be lagging behind.

While referring to new overseas examples like RIOJA, trial publications such as the Japanese Association for the Contemporary and Applied Philosophy's trial and "*Tsuta"* should be utilized to explore diverse possibilities for business models using OJS. It is anticipated that this will entail not only translation and public release of open source software, but publication of actual operating cases and their achievements, facilitating information sharing throughout the IR community. The aim from FY2008 is to be able to announce concrete results for both the CSI Project Area 2 and Nagoya University's plan to digitalize their journal using OJS.

Translated documents are available on the project site. For more information on PKP and OJS please refer to the links below.

Development of a Journal Editing and Publishing System:
http://www.wul.waseda.ac.jp/ir/epubs/
PKP: http://pkp.sfu.ca/

2.5.2 Invoking Co-evolutional Academic Research and Education (Chiba University, Kyushu University)

The aim of this project is to provide a digital environment network for systematic provision of integrated support to research activities including literature searches, informal communication and writing processes.

A trial was carried out which involved installing a document server system and making use of systems like CURATOR, CUFA (Chiba University's Achievement Database) and digital resources, while using the student syllabus as a core for deriving a community of faculty members from across a number of subjects and departments. In other words, this was a trial to link faculty members with potential for collaboration by identifying common themes included in the digital resources they have provided.

In FY2007 feedback from students attending faculty members' lectures were added to the network (random theme/term), and through this a framework was built to derive correlations between different lectures – i.e., driving a researcher community in the area of teaching. This is being combined with work on the mounting of a

pathfinder to integrate information transferred from faculty members to students and refining an integrated system of information required by both sides.

The greatest achievement of this project is that it enables effective searches to be carried out on the community database by combining this bottom-up pattern of gathering feedback on lectures with the top-down (Pathfinder) style of information transfer from faculty to students.

This is a pilot project on employing the contents of repositories and other tools to the context of education: it is hoped that it can eventually be implemented as an actual application of the repository project. However, further effort is required to disseminate the shared system concept, processes and results of the faculty community that has been formed.

2.5.3 Project on Data Sharing for Achievement Database and Institutional Repository (Kanazawa University, Waseda University, Kyushu University)

This program is made up of a development model by Kanazawa University and Waseda University and a separate development model by Kyushu University.

Kanazawa University and Waseda University both set the main objective to provide a one-stop service for article submission by enhancing the functions of their respective achievement DBs. In the current state, the Achievement DB has more intra-organizational visibility than the IR and within the present evaluation environment has a higher level of recognition from university management. Taking advantage of this situation, the achievement DB system has been enhanced to allow researchers to submit actual papers and articles when renewing their database entries (i.e. adding new achievements), in the hope of realizing the following three aims: (1) labor-saving in the area of self-archiving by researchers; (2) using achievement DB metadata in IRs; (3) using the visibility of the achievement DB to encourage more effective self-archiving.

Points (1) and (2) are the realization of the One Input / Multi Use idea of imputing data once to make multiple output possible, which is labor saving for both the researcher and the repository manager. Point (3) aims at leaving out the complicated process of submitting articles to IRs and improving the effectiveness of self-archiving.

The system was developed as a DSpace external attachment tool that allows the following functions:

(1) The system is installed on to DSpace's server disk as an article upload tool.
(2) When the researcher inputs the bibliography from his/her newly written article

into the Achievement DB, the article can also be uploaded directly from the researcher's computer. At this time the article is given a unique ID (Achievement ID).

(3) The bibliography (metadata) from point (2) and the article are forwarded to DSpace and ingested in to an interim community and interim collection.

(4) After confirming approval for registration, the repository manager will edit and add the metadata and map the item to its proper community and collection.

(5) Once it officially becomes an item, a handle name will be outputted to a directory specifying the file which pairs with the Achievement ID.

(6) The Achievement DB periodically acquires the file pair via FTP and using the Achievement ID as a key writes the handle name into the Acievement database as link information to the actual article.

It is hoped that if this uploading of articles from the Achievement DB is made into a routine activity, then in essence it will become a self-archiving function.

Kyushu University developed a mid-way database system to allow reasearchers themselves to link publication information on the researcher database with the full text archived in the Kyushu University Institutional Repository (QIR). The information connecting both sides is written in the mid-way database so when a link-out is made from the researcher database this information is referred to and the document is displayed. In this case the information for data linkage is the researcher database article ID and the QIR article ID and the URL that displays the article. This midway database system is known as an article link system.

The 5 main functions of the article link system are (1) article link function, (2) article saving function, (3) function to save search results, (4) time stamp history update function, and (5) access history management function. Researchers use these functions when updating publication data in the researcher database, to self archive to QIR, to set links out from their researcher database to QIR (via the article link system), and to identify (re-confirm) article links (information) when organizing publication data in their researcher database entries.

The case of Kyushu University is based on the premise that researchers actually carry out self-archiving: researchers themselves use both researcher database and QIR, save their articles and edit article information and enter link out information from the researcher database system to the QIR.

In contrast with this approach, Kanazawa University and Waseda University only require researchers to submit their articles: the remainder is completed by the system using upload tool and handle name return functions, and librarians (i.e., staff in charge of the IR) save items. This is the reason that the self-archive style

and substitute registration style models were separated at the time of development.

In either case, the characteristic feature of this project lies in its linkage between the researcher's article information update activities and the process of saving information on to the IR (self-archiving). It is expected that this approach will lead to an increase in the number of articles saved. Whether or not the implementation of the system results in any changes in researchers' self archiving activities will need to be verified, and further feedback and information sharing will be required.

The products (upload tool, link information output function) developed by Kanazawa University and Waseda University are both publicly available for free download. Efforts are made to share project results and processes online, through activities such as a questionnaire regarding plans for achievement DB and IR collaboration carried out through CSI-IR or DRF mailing lists. The project team must be commended on their efforts to share Area 2 research and development activity with the wider repository community, through public release of outcomes and disclosure and collation of data on results.

The products, documents, questionnaire results and other items from the Project on Data Sharing for Achievement Database and Institutional Repository can be viewed through the link below. For information on the Kyushu University development, please refer to the article below.

Project on Data Sharing for Achievement Database and Institutional Repository website:
http://www.lib.kanazawa-u.ac.jp/kura/achievement/index.html
Ono Mayumi, Inoue Sozo, Hoshiko Nami, and Mori Masao. "Kyûshû daigaku gakujutsu jôhô ripojitori QIR to kenkyûsha jôhô no renkei (Linkage between the Kyushu University Institutional Repository QIR and researcher information)." Kyushu University Library, Research and Development Division Annual Report, July 2006.
https://qir.kyushu-u.ac.jp/dspace/bitstream/2324/8085/1/2006_001.pdf

2.5.4 User Interface by Correlation Map of Controled Keywords (Hokkaido University)

The aims of this project are to make the connection between HUSCAP content titles visible, to allow a systematic search of articles, and to support research.

In concrete terms, the keywords and titles that result from an article provision request on the Web of Science search are grouped and a hash is created using the title as a key. From the hash, connections between titles that share the keyword are defined. The strength of the connection depends on the number of shared keywords.

Depending on this, a graph is defined with the title set as a node then placed in dot language after which the title, author, URI and NDC are extracted from the metadata and linked to the title. The graph is produced in a node configuration following a spring model, and the nodes are given different colors depending on NDC. The URI and author are included into the nodes.

It can be said that this project was successful in its aim to increase IR utility for researchers in the way it graphed the correlation between IR contents and provided a document title search function.

Feedback from faculty regarding the outputs of this project (i.e. document correlation graph) included comments such as, "there are many documents that must be read in the process of education and research – couldn't these be presented in the same way?" and "is it possible to add a time axis?"

It is hoped that by equipping IRs with an analysis function for this type of research support, the document search functions of IRs can be enhanced. However, details of the project and its results need to be shared online. Similarly, the Chiba University project states its main theme and aim as the support of education and research based on content theme and keyword analysis: it could thus be said that both projects are part of the same category of development program.

2.6 External collaboration

2.6.1 Digital Repository Federation (Hokkaido, Chiba and Kanazawa Universities)

The Digital Repository Federation (DRF) has become well known not only among universities involved in CSI-commissioned projects, but also in library circles and repository communities, and among researchers and publishers.

The primary aim of the DRF project is to create a community for mutual support in the operation of IRs, by enabling those engaged therein to share their experiences and insights. The project focuses particularly on collective action towards the promotion of IRs, using a Wiki, mailing list and other tools to share information and experiences from forerunner libraries, and providing assistance for follower libraries.

From the standpoint of open access, it is vital that IR content reaches a critical mass: the development of more robust community-based activity to aid establishment of common goals and build consensus on content issues offers one key to project success. IR initiatives in North America and Europe that are achieving

success at present tend to be found in countries that have developed strong community functions at national level and taken a premeditated approach to project advancement, such as the U.K. and the Netherlands.

Activities in the two years of the DRF project are listed below.

(1) Hosting the DRF Wiki and open mailing list:
http://drf.lib.hokudai.ac.jp/drf/index.php
(2) Sponsoring a series of workshops DRF1 to DRF3 (at Chiba University, Waseda University and the Yokohama Library Fair & Forum)
(3) Sponsoring a series of regional workshops: DRF-Hiroshima (at Hiroshima University), DRF-Kanazawa (at Kanazawa University), DRF-Sapporo (at Hokkaido University)
(4) Holding the DRF International Conference 2008 (at Osaka University)
(5) Creating a list of academic bulletins and a glossary of IR terms
(6) Organizing a combined overseas survey involving the universities of Hokkaido, Tsukuba, Chiba, Kanazawa and Hiroshima:
SHERPA/RoMEO project (University of Nottingham), SHERPA/Leap project (University of London), UKOLN (University of Bath), White Rose Consortium (University of Sheffield), University of Southampton

Hokkaido Universities hosts the server for (1) above. (2) was conducted with the co-sponsorship and collaboration of Kanto Regional Association of the Japan Association of National University Libraries (JANUL) and the Japanese Coordinating Committee for University Libraries. The regional workshops in (3) were also held in association with organizations including the JANUL's Shikoku and Koshinetsu Regional Associations, with emphasis given to partnership with pre-existing library consortiums.

The activities of DRF provided support in line with the expansion of the IR community through the CSI program at NII, and can be deemed a success in terms of creating a new framework to facilitate the ongoing operation of IRs in Japan. Along with the SCPJ project headed by the University of Tsukuba and the Evaluation of Institutional Repository project by Chiba University and its partners, it is possible to characterize DRF as an initiative that has helped lay the foundations for Japan's IR community as a whole, transcending its original scope as a CSI-commissioned project.

Looking beyond Japan, a similar example is provided by the JISC-funded Repository Support Project (RSP) in the U.K. Like DRF, RSP has a workshop series for IR personnel across the U.K., and also organizes a "Summer School" workshop in the summer months.

Projects such as SCPJ, Evaluation of Institutional Repository and DRF lay the foundations to secure the sustainability of the IR community: it is anticipated that they will continue to operate actively and make further contributions to this community. Building on these projects' activities over the two-year commissioned period, it is also hoped that the community will grow from one propelled by a few leaders into one in which many different parties can participate fully.

3. Organization of the Repository Network under CSI

Following on from the discussion in the brief project outlines provided in the section above, some comments will now be made regarding the position of each project in the repository network formed through the CSI program.

Basic IR functions are realized through a network of service providers and data providers that pivots on harvesting through OAI-PMH. This arrangement is termed a "repository network." In the context of CSI, however, it is also possible to perceive a repository network in the complementary structure formed by the various CSI-commissioned projects, as IR groupings and survey/research projects develop collaborative linkages with one another in a supplementary process through which their functions are strengthened mutually. Figure 7 outlines this idea by placing CSI Area 2 projects into four conceptual categories.

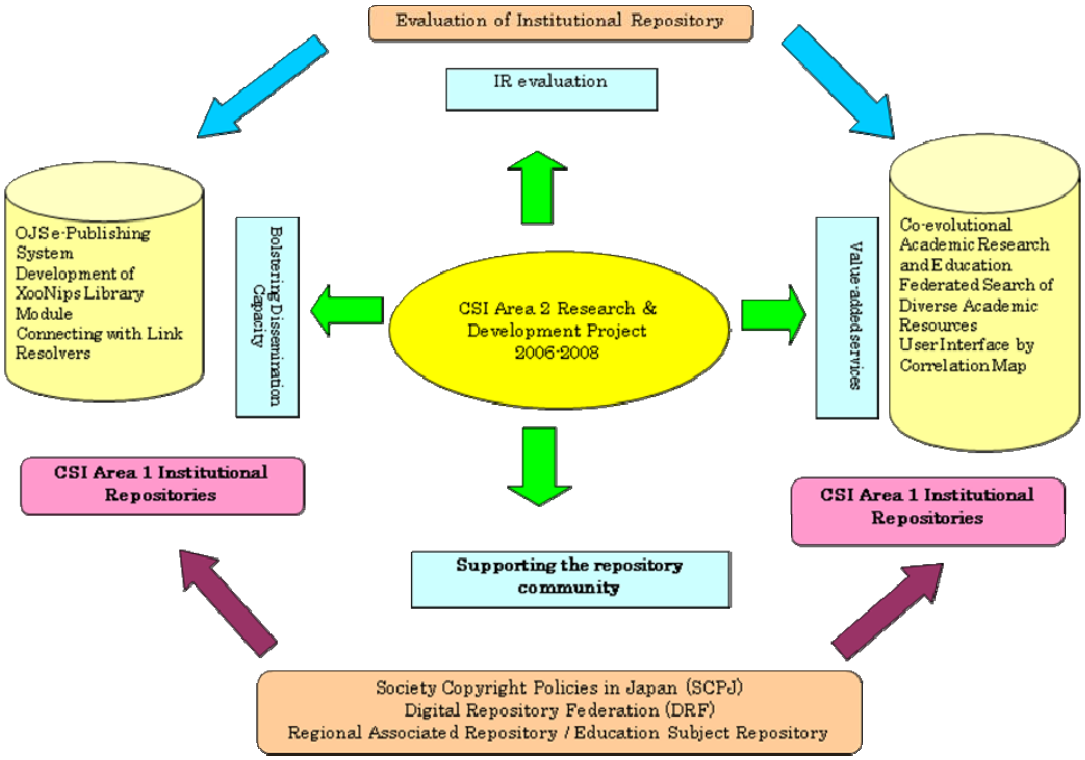


Figure 7. Organization of the repository network under CSI

Supporting the repository community

Through its database of society copyright policies regarding inclusion of content in IRs, SCPJ provides the respository community with the most fundamental source of information for IR operation. Meanwhile, DRF furnishes opportunities for bottom-up training and forums for exchange of ideas through its workshops, website and mailing list.

Regional associated repositories support information dissemination initiatives in the academic community by offering hosting services to regional universities and other academic institutions that would find it difficult to construct a repository on their own. Education subject repositories use horizontal subject-based linkage among repositories to support community-building functions and dissemination of information by researchers, thereby guaranteeing a communal approach to repository operation.

By furnishing the infrastructure required for effective operation of repositories, these projects provide robust indirect support for the IR operations in each university under CSI Area 1. As a whole they can be seen as fundamental to the formation and maintenance of the repository community in Japan.

The most important function of SCPJ is to maintain close communication with academic associations and societies in order to expand the scope of material that can be made available through IRs. Regional associated repositories are a community support initiative designed to expand IR content by aiding the establishment of new IRs: they present an economical model for the viability of repository projects. DRF, a program to foster the next generation of IR personnel, develops model training programs and presents them to the repository community.

Value-added services

Chiba University's program for the development of a researcher community is a value-added service that uses repository and pathfinder content to identify subject correlations among different research items and researchers.

The program on integration of diverse academic resources, implemented by a group of universities including Kyushu, Nagoya and Mie, improves the utility of IRs for researchers and students by enhancing value-added services such as cross-searching of content in repositories and in-house and external databases, and researcher identification functions. Its metadata conversion program has made it easier to include a diverse range of information in repositories.

Hokkaido University's program to develop a user interface employing a correlation map of controled keywords applies subject analysis tools to information contained in IRs to provide a subject-based search interface that promotes more effective use of repositories.

Development of supplementary analysis tools and systems to utilize contents from multiple repositories and databases together provides value added services that heighten the use value of IRs. Adding value to IRs is a crucial part of the agenda for continuation of IR projects into the future.

Strengthening dissemination capacity

The project headed by Waseda University for supporting electronic publishing through the OJS system facilitates dissemination of academic output by researchers by providing assistance for the rendering of institutional bulletins, academic society periodicals and other publications in electronic form. This involves adding a basic e-journal framework to the functions of an IR, thereby equipping it with its own means of academic communication. This system also entails function for academic review and refereeing processes, a capability not possessed by IRs themselves.

The development of a XooNips Library module by Keio University and others produced an open source module specific to Japan and adjustable to the needs of each institution, supporting the accumulation and transmission of both library content and that produced by researchers more generally. The development of a user community has bolstered the sustainability of this open source software and furnished technical support for ongoing information dissemination in each institution.

Hokkaido University's connection of IR and link resolver systems has coupled IRs with major academic resource discovery tools such as Web of Science and Scopus to enhance the visibility of open-access papers and strengthened their communicative function (i.e., capacity for dissemination).

These outstanding projects have all produced manifest outcomes, and the open-source software, resolvers and other tools they have produced have yielded discernible enhancements in dissemination capacity for IRs.

IR evaluation

Area 2 projects have thus yielded value-added services and enhancements to dissemination capacity that augments the utility of IR projects and content developed by universities and institutions in Area 1. Further, their creation of IR

communities has increased the sustainability of those projects.

Chiba and Mie Universities' project for standardization of analysis methods for IR evaluation, on the other hand, analyzes and assesses the outcomes of CSI projects across both Areas 1 and 2, construing objective meanings for IRs from actual usage data. This is a meta-level project for CSI as a whole, and addresses the task of facilitating evaluation of repository projects overall, not just within CSI.

By applying this project's log analysis to the entire repository community and comparing it with ILL demand and supply, e-journal usage scope and other data, it will be possible to undertake objective analysis of academic information distribution through the repository network in Japan.

A distinctive form of repository network is thus being formed under CSI, with the creation of IRs in Area 1 underpinned by the Area 2 projects' strengthening of a range of IR dissemination and usage functions and the formation of a repository community. An effective means of developing such a network is to realize concrete connections between the respective functions of each specific project, at the same time as building a coordinated overall framework. It appears that Phase 1 of CSI has taken the first steps toward the creation of this network.

IV. Outlook for Phase 2 and Beyond

To date, CSI-commissioned projects have involved further expanding IRs and creating content (Area 1) and building new services through collaboration among IRs (Area 2). The outcome of these activities has been wider exposure for the term "institutional repository" itself and the ideas it represents, demonstrated by developments such as a rising proportion of search engine hits for IR content. When our successors look back on the history of IRs in Japan, they will undoubtedly see this first phase as one in which the seeds for subsequent IR growth were sown. Following this line of thinking, it is inevitable that Phase 2 be characterized as a period of cultivation, and Phase 3 as the harvest stage.

IRs can thus be perceived in terms of a progression over several different stages; it is also necessary, however, to comprehend the relationships between the many different constituent factors in IR development. If we are to reap a successful harvest, it will be vital to maintain a firm grasp on the direction for this development as we enter the cultivation stage. This chapter reviews the range of ideas canvassed during the CSI-commissioned projects, using them to inform an exploration of prospects for Phase 2 and thereafter.

1. Future prospects in light of overseas trends

1.1 The move towards obligatory provision of open access by universities, research institutes and research support institutions

One trend which has drawn attention in relation to IRs is the adoption of mandatory open access policies by American and European universities, research institutes and other institutions which provide support and assistance for research activity.

In recent years, North American and European universities, research institutes and grant funders have decided to adopt policies creating a general principle of open access to research findings produced by their researchers. There are an increasing number of cases where IRs are being used to store these research findings and make them available to the public.

According to ROARMAP (the Registry of Open Access Repository Material Archiving Policies)[1)], as of September 2008, 54 universities, research institutes and grant funders have adopted Open Access policies like those referred to above.

To cite an example, in February 2008, Harvard University was given nonexclusive

rights to electronically store and grant access to academic papers of teaching staff from its Faculty of Arts and Sciences, and it was unanimously decided by the faculty that, as a general rule, academic papers would be made accessible to the public through the IRs of the university, free of charge.[2)3)4)] In May 2008, the Harvard Law School[5)] also decided to adopt a similar policy. This was a world-first amongst law schools.

The policy of mandatory registration of research findings with Institutional Repositories has been adopted in America by the Stanford University School of Education[6)] and the Howard Hughes Medical Institute[7)], and in the United Kingdom by the Universities of Southampton[8)] and Stirling.[9)]

Amongst institutions which provide research grant, the Public Access policy of the National Institutes of Health (NIH) in the U.S. [10)], the world's largest biomedical research institute, has drawn particular interest. Under this policy, all researchers who have received support from NIH are required to register their research papers with PubMed Central (PMC, a free, electronic archive of academic journals, managed by National Library of Medicine) within 12 months of having their papers published in an academic journal.

At the time of the decision to adopt this policy in 2005, registration was requested; however in January 2008 registration became mandatory, and it has become a condition of contracts granting research subsidies. It is estimated that more than 80,000 scholarly journal articles will be subject to this policy annually, making the impact of free access via PubMed Central enormous.

Institutions that have adopted policies of providing research assistance funding on the condition that funded journal articles be available for open access include the United Kingdom's Wellcome Trust[11)] and the Research Councils UK [12)], the Canadian Institutes of Health Research[13)], the Australian Research Council[14)], the European Research Council[15)] and the European Commission.[16)]

In stating that "dissemination of the knowledge that our scholarly activities generate is central to the mission of the University,"[17)] Professor Stuart M. Shieber, a key force behind Harvard University's open access policy, suggests that universities and research institutes that have decided to adopt a policy of open access embrace a mission and duty to circulate research findings generated by their researchers for use by virtually anyone.

IRs are the means by which this mission is achieved. These are primarily overseen by university libraries, which have traditionally collected, stored, provided access to, and maintained scholarly information. It took a number of years before Harvard

University decided to implement an Open Access policy, and one may think it unlikely that there will be a rapid increase in the number of universities around the world which will implement similar policies in the near future. However, there is a need to keep a close watch on the effect of open access policies of well-known international universities and research institutes on similar institutions in Japan, and to respond as necessary.

1.2 Assistance in scholarly communication for university associates, via university libraries

In general, researchers have not been greatly interested in the distribution of scholarly information. Although this interest is increasing with time, one cannot help but note that there is still a low level of familiarity with IRs and open access.[18)19)20)] For this reason, in order to ensure implementation of and adherence to open access policies at universities, research institutes and grant funders like those mentioned above, moves are now being made to provide assistance and education in scholarly communication for all those associated with universities, particularly the faculty members. University libraries are playing a central role in providing such assistance.

For example, in the context of the NIH's aforementioned Public Access policy, many university libraries in America are now providing information on the policy and procedures for complying with NIH Public Access Policy. SPARC, an organization of university libraries in the U.S., provides information on its website in support of the NIH policy. This includes an explanatory page, a collection of links to original sources of information, and a webcast focusing on legal rights in relation to the registration of manuscripts with PMC[21)].

In general, university libraries are leading the way in providing education and assistance in relation to scholarly communication. They are, for example, holding group discussions and communicating one-on-one with academic staff members about things such as the economic side of scholarly publication, the rights of the author, contributing to repositories, and the advantages of open access journals. This promotes understanding of the various problems related to scholarly communication. Amongst the 123 university libraries that are affiliated with the Association of Research Libraries (ARL), 55 are engaged in these kinds of activities.[22)]

At the Harvard University Library, in line with the aforementioned open access policy, an Office of Scholarly Communication has been established; repository management, policy enforcement, and outreach activities targeting other faculties are taking place; an advisory committee of academic staff has been established, and

is set to provide support for presentations on open access journals, and address issues in the publishing of humanities-related books and other diverse problems related to scholarly communication. [23)24)]

By engaging in wide-ranging dissemination of the knowledge and research output they have generated, universities and research institutions can potentially attract the individuals who will produce further knowledge and research products in the future. The 2005 Program Evaluation Findings Report[25)] published by Massachusetts Institute of Technology (MIT), a leader in OpenCourseWare (OCW), reveals that 30.7% of newly-enrolled MIT students were aware of its OCW site before applying, with 35% of these indicating that the OCW site was either very important or important to their choice of university. Thus, although the numbers are limited, in MIT's case the provision of information resources online appears to be having a positive influence on prospective students.

Within Japan, the July 2008 release of the government's plan to accept 300,000 international students has highlighted the need to bolster information dissemination as one way of enhancing universities' admissions and enrollment functions. IRs have the potential to operate as valuable information sources for prospective international students selecting undergraduate and graduate programs in Japanese universities. Beyond IRs themselves, it should also be possible to develop linkage with OCW – now being adopted by more and more institutions in Japan – to offer access to information on both educational content and research output through a unified digital archive, providing a complete showcase of teaching and research activity at the university.

2. General level

The most important role of institutional repositories is seen as that of leading a "revolution in academic communication." However, we still do not have a concrete image of what will come after the revolution. If we continue this program without a common perception of our goals there is a danger that the projects that were undertaken in Area 2 will conclude in their present disjointed state. Before we move in to the second phase of the project we should establish a certain level of shared understanding. There is a pressing need to develop a grand design for cyber science infrastructure, not least for the purposes of securing a new budget allocation.

In the UK, JISC commissioned a project on linkage among UK repositories that has created an organizational model, a technical model and a business model. While these JISC models provide a good point of reference, they cannot be applied as-is, due to the differences in the Japanese situation. With this in mind, in preparation for the grand design that will inevitably become necessary in the near future, this

section of the report will present a model constructed from points that have arisen in the CSI project.

Figure 8 is a conceptual model of IR creation and usage. First of all, it is presumed that the two principal elements that constitute an IR are "people" and "items"; on top of those, the IR's functional aspects are broken into "creator" and "consumer." The left side of the figure is the creator side and the right, consumer. On the creator side, "items" begin with consumer (developer) relationships, with metadata assigned to the items from a consumer's perspective. Meanwhile, on the consumer side, access is through item relationships, and metadata is assigned with value added from a community standpoint encompassing disciplinary fields and academic societies.

The reason that discussions on metadata scale often process at cross-purposes is that they do not differentiate between metadata assigned at the time of creation and metadata for use. Also, as can be seen from the descriptions of Area 1 and Area 2 in this report, Area 1 centers its discussion on the left or creator side, while Area 2 mixes discussions from both the creator side and consumer side. It is thought that until now many people have experienced a sense of misalignment when discussing IRs: this can be explained by a lack of sufficient distinction between creator and consumer sides. To be precise, while both sides share the same principal elements of people and items, there was no awareness that the roles and relations of people and items differed. In the future it is possible that technology allowing access to individual items, including the development of metadata sets, may be developed further. OAI-PMH and OAI-ORE can be taken as examples of this trend. However, no matter what type of technology is developed, a distinction between different item types is necessary: immediate procedural and organizational provision should be made for the application of the DOI system.

The second important role of IRs is the permanent preservation of contents. This is related to the storage of metadata: as digital information sources become more central to the processes of disseminating scholarly and academic information, it becomes crucial for each institution to make its research findings and educational outcomes available via the Internet, and to preserve them permanently. These developments could also find active application in the context of accreditation – a challenge now being confronted by all academic institutions.

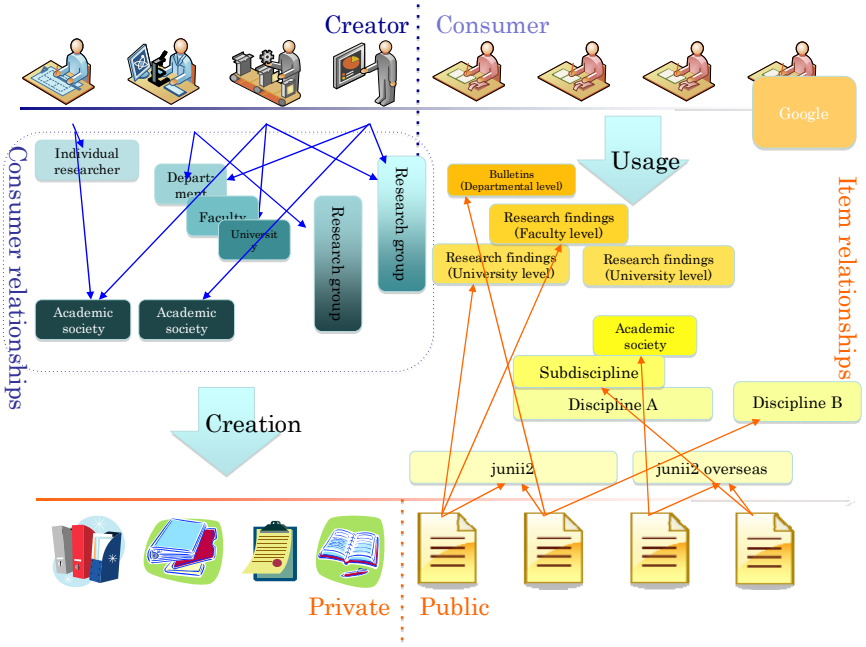


Figure 8. Conceptual model of creation and consumption

3. Institutional level

The third important role for IRs is that of "improving university visibility and accountability." This is usually explained as the university's responsibility to communicate to society the fruits of its research and education activities. This concept may first appear quite comprehensible; however, from the perspective of the wider community, simply saying that one has created an institutional repository is not likely to be seen as a sufficient way of fulfilling that responsibility. Here we need to reconsider the nature of university accountability with regards to IRs. In other words, until now the focus has been on the "repository," with almost no thought given to the "institution". More discussion is needed about the elementary proposition of what an "institutional" repository is. The following paragraphs identify some key points for further consideration of this issue, to be carried over into discussion of the Phase 2 agenda.

The easiest way to think of an "institution" is as a "showcase." This is a term that is often used when explaining IRs, but like "accountability," does not appear to have been given the kind of considered attention that it deserves. It was inevitable that the main focus of Phase 1 was to create the repository itself, but it is also clear that the IR will not become a showcase just by registering contents randomly. In a traditional library display, simply lining up the materials in a glass case or on a table does not make a true display. The order in which the materials are presented must not only suit the content and context of the materials, but each individual

resource's position as one of the whole; consideration must also be given to whether the materials are in accordance with the overall theme of the display. In the same way, an IR is not a showcase simply because its contents can be searched and browsed. It must be made clear which contents will be used to construct which context, and what message is to be conveyed. In other words, we return to the problem of how the university's identity can best be formulated.

Nowadays, regardless of whether they are public or private, universities stake their survival on publicity and communication, trying to convince the public of their unique attributes in education, research and social contribution. Studies invariably point to the website as the principal means by which prospective students choose their universities. If a university can showcase its distinguishing features through IRs, it gains an important advantage in the pursuit of prospective students. From the students' perspective, the IR is a tool that helps them evaluate whether or not the alluring words used to describe the university in abstract actually ring true. In short, it can be said that the contents of the IR constitutes important evidence of the university's activities. As mentioned in IV.1.2, the situation is the same overseas.

Once the IR is recognized as "evidence," a variety of applications to university administration become possible. For example, evidence of educational and research activities could become evidence for use in budget acquisition. When seeking to access competitive funding sources, researchers can use IR contents to underline their proficiencies and their capacity for using funds effectively. The same can be said for soliciting donations from the private sector, municipalities, alumni associations and supporting groups. The IR could also be used as evidence for the allocation of funds and human resource management within the institution. Presently most institutions require faculty to submit a list of authored works to demonstrate their achievements: it is not possible, however, to assess the content, quality and value of researchers' work from such a list. Linkage with the IR would enable actual content to be easily confirmed. The quality of educational and research activities can thus be demonstrated. It follows that in the future, universities will need to develop the capacity to prepare this showcase from an administrative standpoint.

If, in this way, the IR becomes an important means for displaying the distinguishing features of the "institution," a method of evaluating not only *quality* but also *quantity* becomes necessary. A practical way to demonstrate the effectiveness of the IR is to display information on the extent of its usage. The method stated in "III. 2.4 Creating Evaluation Standards for Institutional Repositories" analyses log files and makes it possible to produce a standardized output evaluation index without placing a heavy burden on the institution, allowing institutions to evaluate IR output even in situations where this was formerly problematic. What is needed is the

development and expansion of an output evaluation system that combines access log filtering compliant with COUNTER standards, metadata capture, and output of analysis results. Some ideas that may be considered are: (1) development of a set of standard data specifications; (2) construction of a server for output evaluation demonstrations; (3) development of software to allow log data from several universities to be handled simultaneously; (4) integration with access log filtering software; (5) isolation and management of IP addresses for exclusion from the access count; (6) development of modules to assimilate metadata to log files.

With the participation of several universities, a demonstrative experiment could be carried out and evaluated. Based on this evaluation, a practical system could be developed to evaluate IR output nationwide. This will require development of implementation procedures, and continued research and development to identify and manage the IP addresses to be excluded from the access count. At the same time, the framework for system administration and maintenance should also be considered.

It will also be necessary to review these data through comparison with IR content analysis data, analytical data from the Web of Science, SCOPUS and other commercial information services used to evaluate academic information distribution, and data from IR output evaluation systems. It will also be possible to engage in multiple forms of analysis on the much discussed topic of whether or not "documents stored in IRs are often cited."

It is hoped that through the realization of the above, it will become possible to demonstrate the effectiveness of IRs to stakeholders such as those in finance, university administration and research, thus raising the level of recognition of IRs and making it easier to obtain the necessary assistance from both within and outside the institution.

In addition, guidelines should be determined for the construction of IRs from an evaluation viewpoint, based on a review of international trends. Past achievements and projected results could be reported and a workshop held in order to achieve a widened awareness of the proposed guidelines and to solicit feedback thereon. At this workshop an international proposal could be made on methods of quantifying IR usage, based on Japan's experiences. IR creation and evaluation guidelines could act as a guide for universities considering creating an IR; it is anticipated that such guidelines would also have a significant effect both on universities that do not yet operate IRs, and in terms of general public awareness of IRs achieved through channels such as the mass media.

We must also work to promote IRs for the purpose of accountability in institutions of

higher education (i.e., universities and research institutions). To this end, it will be necessary to conduct publicity activities aimed at stakeholders, particularly the general public, informing them of the abovementioned data, empirical analysis and research trends, and trends in information usage.

4. Library level

The three challenges that libraries need to address in Phase 2 are as follows:

(1) Becoming coordinators of communication from the "creator" side as mentioned under "2. General Level" above.
(2) Becoming showcase editors as mentioned under "3. Institutional Level."
(3) Becoming service creators integrating existing library services.

The institutional mission is to transmit all intra-organizational items with appropriate metadata. In doing so, the possibility arises for not only the major contents but also minor contents to be placed in the spotlight. As a result, the institution can demonstrate its unique characteristics in more detail, as well as reaping the benefits of value invested by external users. The library is the only department that can appropriately assign metadata and coordinate their transmission. In the process of seeking to accumulate *all* items held within the institution, the library inevitably gains an appreciation of the institution's activities and an understanding of its distinctive features. Conversely, the depth of the library's understanding of the institution's activities will be reflected in the quality of its showcase. In this way, the launch of an IR is an excellent opportunity for libraries to make their presence known in a bigger way.

However, it is important not to accord IRs too much special treatment. As was the case for "digital libraries" in the 1990s, designating the IR as an independent administrative unit creates a sense of division between library services and IR services both within and outside the library organization, leading to isolation of both staff and service. The result is that the IR's achievements are measured separately, and the anticipated synergic effect with other university activities can no longer be realized. An additional concern is that if the IR is perpetually treated differently, it will never be included as a part of the university's regular services.

If there is anything to be learned from the "digital libraries" of the 1990's, it is that perception of the need for incorporation in general library service was lacking. Digital library enterprises were an inevitable part of the era in question and, as mentioned in the first chapter of this report, their contribution in terms of developing the digital service environment is still felt today. In particular, the development of the technical platform for metadata owes a lot to the work that was conducted on digital libraries.

The concept of library services did not originally refer to one single service, but to a variety of connected functions that complement each other. Each individual function is positioned appropriately within the process of document delivery in its broadest sense, forming part of a system in which the document is ultimately delivered to the user. We must always be conscious of the place of institutional repositories, as well as electronic journals, databases and books in this document delivery process. An IR will not solve all problems, but neither will it be possible to restructure library services without them. It is important to maintain a firm sense of relativity and balance.

5. Researcher level

Much debate on IRs has been raised from the researcher level perspective. The following paragraphs will focus on scholarly papers and articles as IR content.

There are some who question the significance of the enormous assemblage of bulletins and periodicals that characterize IR content at Japanese universities. However, the role of these publications serving as a broad base supporting top-level research should be acknowledged. Without doubt, academism in Japan would not be what it is today if either of these base studies and top-level research was missing. At the very least, it is only reasonable to provide portals using OAI-PMH to harvest metadata from university bulletins in such fields as humanities, education and natural science. Even in the natural sciences, there is no doubt that the publication of bulletin articles still constitute activity supporting research that is later published in the top journals.

It should be noted that the reason some researchers do not use IRs is only that "IRs are not used in their specialty field of research," and not that they are rejecting the creation of content itself. A typical example of this is of a mathematician using arxiv.org for pre-print searches and MathSciNet for article searches. Regardless of this, there are IRs furnished with high quality metadata and the OAI-PMH metadata API serving as an important part of content supply.

The significance of the IR can be seen in the fact it can provide a picture of the institution's activities as a whole. While in this era it is natural for institutions to have a website, there are still few websites that are constructed to allow an overview of the whole range of institutional activities. The IR has a part to play here, alongside systems like OCW.

The use of the term "overview" demands some more thorough explanation. When assessing research output, in the commonly-used sense of scale and quality (for

example, referring to articles published in journals included in Web of Science) universities such as The University of Tokyo and Kyoto University may well come out on top; surely, however, small and medium-scale universities should be able to differentiate themselves by presenting distinctive forms of output, not produced by the likes of Tokyo and Kyoto Universities, alongside the more conventional forms.

There is also a high probability those accessing general information about a university via a search engine – be they students trying to decide on a university, members of an evaluation team seeking to evaluate the university, or interested members of the general public – will proceed to browse a little. Contents that provide a broad overview of the institution's features may provide a buttress against crude uniform assessment.

A university information database that focuses on search functions does not accord with the goal of providing an effective overview, and regular web pages tend to be too transient: IRs thus have high potential to take the lead here. A research group seeking to make cross-organizational use of content held in the IR will require high quality metadata: because the library is the only department that can design and furnish such metadata, it is the only department suited to managing the IR. It would be pleasing to see this metadata developed in consultation with the institution's researchers whenever possible.

In order to create an IR that satisfies the conditions mentioned above, the library needs to be sensitive to all the activities of the entire institution, and accumulate documents and communicate with researchers with that in mind. Of course, such a feat will probably be impossible at the outset. The problem is not ignorance, but whether or not it is possible to formulate a strategy for tapping the institution's distinguishing features, and whether or not the process of identifying these features one by one, through communication with a wide range of researchers, can continue uninterrupted. For example, the responsible staff at Hokkaido University followed this process faithfully, working closely with other departments like the Communicators in Science and Technology Education Program and succeeding in creating an outstanding IR.

With the rise of Google, there is now virtually no information that is not available on the internet. IRs that collect only university bulletins without taking into account institutional characteristics, and those biased towards the collection of teaching resources alone, are effectively impeding their own chances of breaking through to new horizons. The fact that visitors to IRs come via search engine sites does not contradict this reality: well-organized IRs should be able to increase visitor numbers from search engine sites also.

Because an IR is not simply a database nor a website but a totally new concept, it is open to many different interpretations and inevitably entails problems in the early stages of development. That is precisely why it is important to develop an accurate understanding as we enter the propagation phase.

6. Summary

From the discussion above it is possible to construct the following agenda for Phase 2 and beyond.

(1) In order to further clarify the direction for cyber science infrastructure in terms of building shared understandings, the outcomes of Phase 1 should be drawn together and subjected to evaluation.
(2) An overhaul of IRs should be conducted from the various standpoints of creators, consumers (users) and other stakeholders, identifying and addressing deficiencies in function, services and other factors from each standpoint. Care should be taken to keep this process separate from issues of actual IR content.
(3) A system should be established for the provision of item identifiers, the foundation technology for all IR operations.
(4) Showcase functions should be strengthened with the aim of realizing substantial advancements in institutional accountability.
(5) Solutions to technical and policy problems should be sought that will enable permanent storage of IR content.
(6) IRs should be situated and instituted more clearly within the overall service framework of university libraries.

Debate on IR issues continues as we embark on Phase 2. Further practical trials and discussions are necessary to ascertain what is required to advance the cause of the institutional repository, a tool that holds the potential to transform the concept of e-Science and the fundamental processes of academic research.

References

1) "ROARMAP." http://www.eprints.org/openaccess/policysignup/ (accessed November 26, 2008)
2) Cohen, Patricia. "At Harvard, a Proposal to Publish Free on Web." http://www.nytimes.com/2008/02/12/books/12publ.html (accessed November 26, 2008)
3) "Harvard To Collect, Disseminate Scholarly Articles For Faculty." http://www.fas.harvard.edu/home/news-and-notices/news/press-releases/scholarly_02122008.shtml (accessed November 26, 2008)
4) Darton, R. "The Case for Open Access," *The Harvard Crimson*.

http://www.thecrimson.com/article.aspx?ref=521835 (accessed November 26, 2008)
5) "Harvard Law faculty votes for 'open access' to scholarly articles." http://www.law.harvard.edu/news/2008/05/07_openaccess.php (accessed November 26, 2008)
6) "Stanford University School of Education's Open Access Policy." http://ed.stanford.edu/suse/faculty/dspace.html (accessed November 26, 2008)
7) "Research Policies: Public Access to Publications (SC-320)." http://www.hhmi.org/about/research/sc320.pdf (accessed November 26, 2008)
8) "University policy on self-archiving and open access provision." http://eprints.soton.ac.uk/dvcmemorandum.html (accessed November 26, 2008)
9) "Digital Repository ePrints Policy." http://www.is.stir.ac.uk/research/repository/eprint-policy.php (accessed November 26, 2008)
10) "NIH Public Access Policy." http://publicaccess.nih.gov/policy.htm (accessed November 26, 2008)
11) "Open and unrestricted access to published research." http://www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Open-access/Guides-and-FAQ/WTX031743.htm (accessed November 26, 2008)
12) "RCUK position on issue of improved access to research outputs." http://www.rcuk.ac.uk/access/default.htm (accessed November 26, 2008)
13) "Policy on Access to Research Outputs." http://www.cihr-irsc.gc.ca/e/34846.html (accessed November 26, 2008)
14) Australian Research Council. "Discovery Projects: Funding Rules for funding commencing in 2008." http://www.arc.gov.au/pdf/DP08_FundingRules.pdf (accessed November 26, 2008)
15) "ERC Scientific Council Guidelines for Open Access." http://erc.europa.eu/pdf/ScC_Guidelines_Open_Access_revised_Dec07_FINAL.pdf (accessed November 26, 2008)
16) "Commission launches open access pilot project." http://cordis.europa.eu/search/index.cfm?fuseaction=news.document&N_RCN=29774 (accessed November 26, 2008)
17) "Interview: Stuart Shieber." *Harvard University Library Notes*, no.1344 (July 2008). http://publications.hul.harvard.edu/ln_1344/interview-stuart-shieber.html (accessed November 26, 2008)
18) Brown, S and Swan, A. "Researchers' Use of Academic Libraries and their Services: A report commissioned by the Research Information Network and the Consortium of Research Libraries." Research Information Network (April 2007). http://www.rin.ac.uk/files/libraries-report-2007.pdf (accessed November 26, 2008)

19) Rowlands, I, Nicholas, D, and Huntington, P. “Scholarly communication in the digital environment: what do authors want?” *Learned Publishing*, vol.17, no.4 (2004) p. 261-273.
20) Swan, A and Brown, S. *JISC/OSI Journal Authors Survey Report*. Key Perspectives Ltd. (2004).
21) Association of Research Libraries. “Implementing Public Access Policies.” http://www.arl.org/sc/models/public-access/index.shtml (accessed November 26, 2008)
22) Newman, K. A, Blecic, D. D, and Armstrong, K. L. *Scholarly Communication Education Initiatives*. Association of Research Libraries (2007).
23) “Harvard University Library : Office for Scholarly Communication.” http://osc.hul.harvard.edu/ (accessed November 26, 2008)
24) “Stuart M. Shieber to Lead Harvard's Office for Scholarly Communication.” *Harvard University Library Notes* no.1343 (May 2008). http://publications.hul.harvard.edu/ln_1343/stuart-m-shieber-to-lead-harvards-office-for-scholarly-communication.html (accessed November 26, 2008)
25) “2005 Program Evaluation Findings Report.” http://ocw.mit.edu/ans7870/global/05_Prog_Eval_Report_Final.pdf (accessed November 26, 2008)

Topics: 1

Analyzing IR Access Data: Methodologies and Trends

Digitization has brought great changes in terms of enhanced speed and simplicity to the process from discovery to acquisition of materials for use by researchers and students. It has also presented new possibilities to service providers – intermediaries in this process – in the form of extensive access logs that were impossible to attain in an environment based on printed media. Proper analysis of these access logs enables providers to comprehend usage patterns in unprecedented detail (i.e., individual document level): the anticipated outcome is a deeper understanding of "usage" and "users" that will optimize planning and development. For organizations administrating digitized facilities, the employment of more realistic indicators opens up the potential to secure accountability of both planning processes and the organization itself, and for pursuing advocacy.

A key challenge in the area of IR access log processing is to establish a standard processing method to provide benchmarks for analysis and comparison. One task is the development of a technique for eliminating extraneous data from raw access logs, as recommended in the COUNTER Code of Practice (third version released in August 2008), a source of practical guidelines on the application of e-journal and database usage statistics. The CSI Area 2 project "Evaluation of Institutional Repository" conducted by Chiba University and Mie University up to FY2007 addressed this task and proposed one possible processing method.

The second question is how to apply the standardized processing method to actual IR operations. There are quite a number of different types of software used for IR platforms in Japan, including DSpace, E-repository and XooNips. Developing different statistical systems for each type of software would clearly be inefficient; furthermore, there is no guarantee that individual IRs would process data properly on their own. One desirable approach, therefore, is the provision of a statistical system that uses data from web server access logs, a log format common across all institutions. The FY2008 CSI Area 2 project on " Standardization of usage statistics for IR evaluation" (Chiba University) is investigating possibilities for a centralized processing method that includes metadata processing.

Overseas, interest in the "usage factor" of academic papers and authors is growing, with a view to further analysis of IR access data. One initiative in this area is the PIRUS (Publisher and Institutional Repository Usage Statistics) Project administered by JISC, the Joint Information Systems Committee in the U.K. Scheduled for implementation over five months from August to December 2008, the aim of PIRUS is "to develop COUNTER-compliant usage reports at the individual

article level that can be implemented by any entity (publisher, aggregator, IR, etc.,) that hosts online journal articles and will enable the usage of research outputs to be recorded, reported and consolidated at a global level in a standard way." The background to this project lies in the move to include article usage levels as one of the items in assessment of research performance, as part of an overhaul of the Research Assessment Exercise (RAE) system in the U.K. Exactly what is meant by article "usage," and how it can be employed, are questions that will require further consideration into the future; nevertheless, it appears certain that the subject of usage data analysis is changing from the level of journals to that of articles, and that this is informed by a major shift away from discrete systems and towards an integrated environment.

Topics: 2

A Researcher's Perspective on the Use of IRs: Case Study from the Field of Mathematics

At present, periodicals in the field of mathematics are categorized into journals published by mathematics departments at leading universities, the Mathematical Society of Japan and the Japan Academy, and bulletins published by mathematics departments in faculties of science, engineering, education and former liberal studies schools at medium- and small-scale universities. Most of these periodicals' electronic editions use platforms compatible with OAI-PMH, and a portal has now been formed through metadata harvesting from 14 different repositories. At the same time, the value of these periodicals as research materials has been enhanced by merging classifications and identifiers provided by the Mathematical Reviews database. The portal is located at dmljp.math.sci.hokudai.ac.jp.

There are around 300 periodicals published in Japan that include mathematical content, containing around 70,000 articles. The top 30 periodicals, and around 30,000 articles, have been digitized through either SPARC JAPAN or IRs. 20,000 of these articles are on the SPARC JAPAN partner journal platform ProjectEUCLID, while more than 10,000 are held by IRs. This is significant in terms of volume, and an important outcome of collaboration between the National Institute of Informatics, university libraries, and researcher communities.

Research in the field of mathematics tends not to become outdated: the process leading to practical application of the research often spans several decades. It is thus particularly crucial that articles written in the past are made available for electronic access. The total number of articles that can be included under the broad heading of mathematics numbers 2.2 million on the Mathematical Reviews database: digitization of such a collection in its entirety is thus possible. The moves towards digitization in Japan were prompted by the advancement of a World Digital Mathematics Library scheme in Europe and North America. Lagging well behind other nations in the field of digitization, Japan's mathematics community risked being left out of this scheme. At a workshop held at Berkley in April 2005, a proposal was put forward for all nations to use 600 dpi+ Optical Character Recognition (OCR) for digitization of printed media content, which would then be harvested using OAI-PMH, with a five to three year moving wall set for sale and exchange. Digital Mathematics Library 2008, held in Birmingham in July 2008, resulted in a call for across-the-board OCR digitization.

Along with biology, mathematics has been addressed as a key area under the second phase of SPARC JAPAN since 2005. To date, eight of the leading journals published

in Japan have been digitized. The Construction and Release of Mathematical Literature Archive project, a subject repository initiative in the area of mathematics, which aims to digitize periodicals other than those selected by SPARC JAPAN in accordance with WDML standards, was selected as an Area 2 CSI-commissioned project in FY2006. The libraries of the University of Tokyo and Kyoto University have worked alongside the researcher community in Area 2 on metadata specifications, and these have been mounted on DSpace at the University of Tokyo.

There are a large number of periodical titles in the field of mathematics, and for most periodicals the total number of articles per title ranges from two to three figures. This broad coverage within relatively small numerical parameters may make IRs well suited to function as platforms for the digitization of mathematics literature and the cross-sectional organization thereof. This could also be seen as one application of the "small science" concept discussed at the International Conference on Open Repositories 2008.

Appendix: Reference Materials

1. Area 1: IR Outlines provided by commissioned institutions

2. Area 2: Project outlines
    - 2.1 Projects operating from FY2008-2009
    - 2.2 Projects operating in FY2008 only

3. Relevant advisory council reports, etc.

4. Working Committee activity records
    - 4.1 FY2005 Institutional Repository Working Committee
    - 4.2 FY2006 Institutional Repository Working Committee
    - 4.3 FY2007 Institutional Repository Working Committee
    - 4.4 FY2007 Library Liaison Working Committee

5. Screening and selection of commissioned project proposals
    - 5.1 FY2007 Next Generation Academic Information Infrastructure Commissioned Project Proposal Form
    - 5.2 FY2007 Next Generation Academic Information Infrastructure Commissioned Project Proposal Selection Guidelines
    - 5.3 FY2007 Next Generation Academic Information Infrastructure Commissioned Project Proposal Evaluation Criteria

6. Calendar of events
    - 6.1 FY2005
    - 6.2 FY2006
    - 6.3 FY2007

1. Area 1: IR Outlines provided by commissioned institutions

No	Organization name	Institutional repository name	URL	Software	Trial release date	Release date
1	Hokkaido University	Hokkaido University Collection of Scholarly and Academic Papers	http://eprints.lib.hokudai.ac.jp/	Dspace	2005/07/20	2006/04/01
2	Obihiro University of Aguriculture and Veterinary Medicine	Obihiro University of Aguriculture and Veterinary Medicine Academic Repository	http://ir.obihiro.ac.jp/	Dspace	2007/02/19	2007/06/01
3	Kitami Institute of Technology	Kitami Institute of Technology Repository	http://kitir.lib.kitami-it.ac.jp/	Dspace 1.2.3	2007/05/10	2007/06/18
4	Asahikawa Medical College	Asahikawa Medical College Repository AMCoR	http://amcor.asahikawa-med.ac.jp	XooNIps	2007/02/15	2007/02/28
5	Hirosaki University	Hirosaki University Repository for Academic Resources	http://repository.ul.hirosaki-u.ac.jp/dspace/	Dspace	2007/03/14	2008/05/01
6	Tohoku University	Tohoku University Repository TOUR	http://ir.library.tohoku.ac.jp/re/?locale=en	Dspace	2006/12/15	2007/03/05
7	Yamagata University	YOU Campus Repository	http://repo.lib.yamagata-u.ac.jp/?lang=en	NALIS-R	2007/03/26	2007/07/01
8	Fukushima University	Fukushima University Repository	http://ir.lib.fukushima-u.ac.jp/	Dspace	2007/12/10	2008/03/03
9	University of Tsukuba	Tulips-R	http://www.tulips.tsukuba.ac.jp/dspace/	Dspace	—	2007/03/23
10	Gunma University	GAIR:Gunma University Academic Information Repository	https://gair.media.gunma-u.ac.jp	Dspace	2007/03/01	2007/11/20
11	Saitama University	Saitama United Repository for Access to Outcomes from Resources	http://sucra.saitama-u.ac.jp/	XooNIps	2007/03/20	2008/03/01
12	Chiba University	Chiba University Repository for Access to Outcomes from Resources	http://mitizane.ll.chiba-u.jp/curator/index_e.html	e-Repository	2003/05	2005/02/18
13	The University of Tokyo	UT Repository	http://repository.dl.itc.u-tokyo.ac.jp/index_e.html	Dspace	—	2006/04/01

No	Organization name	Institutional repository name	URL	Software	Trial release date	Release date
14	Tokyo University of Foreign Studies	Prometheus Academic Collections	http://repository.tufs.ac.jp/doc/index_e.html	Dspace	2007/06/15	2008/03/01
15	Tokyo Gakugei University	Tokyo Gakugei University Repository	https://ir.u-gakugei.ac.jp/?lang=en	NALIS-R	—	2007/04/01
16	Tokyo Institute of Technology	Tokyo Tech Research Repository	http://t2r2.star.titech.ac.jp/index_en.html	T2R2	2007/01/09	2007/08/31
17	Ochanomizu University	TeaPot:Ochanomizu University Web Library - Institutional Repository	http://teapot.lib.ocha.ac.jp/ocha/?locale=en	Dspace	2007/03/29	2007/04/18
18	Hitotsubashi University	HERMES-IR (Hitotsubashi University Repository)	http://hermes-ir.lib.hit-u.ac.jp/ir/index.html	Dspace	—	2007/05/01
19	Yokohana National University	Yokohama National University Repository	http://kamome.lib.ynu.ac.jp/	Dspace	2007/03/22	2008/10/01
20	Niigata University	Niigata University Academic Repository	http://repository.lib.niigata-u.ac.jp/	Dspace	2007/05/15	2007/05/17
21	Kanazawa University	Kanazawa University Repository for Academic Resources	http://dspace.lib.kanazawa-u.ac.jp/dspace/	Dspace	2006/04/01	2006/06/12
22	Shinshu University	Shinshu University Institutional Repository	https://soar-ir.shinshu-u.ac.jp/	Dspace	2007/03/15	2007/08/01
23	National University Corporation Gifu University	Gifu University Institutional Repository	http://repository.lib.gifu-u.ac.jp/?lang=en	NALIS-R(Dspace)	2007/02/15	2008/03/31
24	Nagoya University	NAGOYA Repository	http://ir.nul.nagoya-u.ac.jp/dspace/	Dspace	2006/01/11	2006/02/28
25	Mie University	MIUSE(Mie University Scholarly E-collections)	http://miuse.mie-u.ac.jp/	Dspace	2006/11/15	2007/03/29

No	Organization name	Institutional repository name	URL	Software	Trial release date	Release date
26	Shiga University of Medical Science	Shiga University of Medical Science Open Repository	http://repository.shiga-med.ac.jp/dspace/	Dspace	2007/04/01	2008/04/01
27	Kyoto University	Kyoto University Research information Repository	http://repository.kulib.kyoto-u.ac.jp/	Dspace	2006/06/07	2006/10/02
28	Kyoto Institute of Technology	KIT Academic Repository	http://repository.lib.kit.ac.jp/dspace/index.jsp	Dspace	2007/03/27	2008/03/31
29	Osaka University	OUKA (Osaka University Knowledge Archive)	http://ir.library.osaka-u.ac.jp/portal/index_e.html	e-Repository	—	2007/02/20
30	Osaka Kyoiku University	Osaka Kyoiku University Repository	http://ir.lib.osaka-kyoiku.ac.jp:8080/dspace/	Dspace	2007/08/02	2007/11/01
31	Kobe University	Kobe University Repository Kernel	http://www.lib.kobe-u.ac.jp/kernel/	Infolib-DBR	2006/07/12	2006/10/02
32	Hyogo University of Teacher Education	HEART:Hyokyo Educational Academic Resources for Teachers	http://repository.hyogo-u.ac.jp/	Dspace	2007/04/16	2008/03/11
33	Nara University of Education	Nara University of Education Academic Repository	http://dspace.nara-edu.ac.jp:8080/dspace/	Dspace	2006/12/01	2007/03/01
34	Nara Wemen's University	Nara Wowen's University Digital Information Repository	http://nwudir.lib.nara-wu.ac.jp/	Dspace	2007/03/30	2008/03/04
35	Shimane University	Shimane University Web Archives of Knowledge	http://sir.lib.shimane-u.ac.jp/	e-Repository	2007/03/02	2007/04/02
36	Okayama University	ePrints@OUDIR	http://eprints.lib.okayama-u.ac.jp/	Eprints	2006/10/02	2007/04/01
37	Hiroshima University	Hiroshima University Institutional Repository	http://ir.lib.hiroshima-u.ac.jp/portal/	e-Repository	2006/04/12	2006/10/06
38	Yamaguchi University	Yamaguchi University Navigator for Open Access Collection and Archives	http://petit.lib.yamaguchi-u.ac.jp/eng/	InfoLibDBR	2006/01/10	2007/10/16

No	Organization name	Institutional repository name	URL	Software	Trial release date	Release date
39	Kochi University	Kochi University Digital Repository for Academic Resources	https://ir.kochi-u.ac.jp/dspace/	Dspace	2007/12/27	2008/03/24
40	Kyushu University	Kyushu University Institutional Repository	https://qir.kyushu-u.ac.jp/dspace/	Dspace	—	2006/04/14
41	Saga University	Saga University Institutional Repository	http://portal.dl.saga-u.ac.jp/	NALIS-R	2006/12/01	2008/03/24
42	Nagasaki University	Nagasaki University's Academic Output SITE	http://naosite.lb.nagasaki-u.ac.jp/?locale=en	Dspace	2006/04/28	2007/02/07
43	Kumamoto University	Kumamoto University Repository	http://reposit.lib.kumamoto-u.ac.jp/	NALIS-R(Dspace)	2006/03/31	2006/05/01
44	Oita University	Oita University Institutional Repository : OUR	http://ir.lib.oita-u.ac.jp/dspace/	Dspace	2007/05/15	2008/03/17
45	Kagoshima University	Kagoshima University Repository	http://ir.kagoshima-u.ac.jp/?lang=en	Dspace	2003/12/21	2007/04/01
46	University of the Ryukyus	University of the Ryukyus Repository	http://ir.lib.u-ryukyu.ac.jp	NALIS-R	2007/03/01	2007/11/16
47	Japan Advanced Institute of Science and Technology	JAIST Repository	https://dspace.jaist.ac.jp/dspace/index.jsp?locale=en	Dspace	2007/05/30	2007/05/30
48	Keio University	Keio Associated Repository of Academic resources	http://koara.lib.keio.ac.jp/	XooNIps	2006/02/01	2006/10/01
49	Toyo University	Toyo Univ Spatial Repository	http://gbs2.itakura.toyo.ac.jp/repository	GLOBALBASE	2006/10/15	2007/10/16
50	Hosei University	Hosei University Repository	http://rose.lib.hosei.ac.jp/dspace/index.jsp	Dspace	—	2007/04/16
51	Waseda University	DSpace@Waseda University	http://dspace.wul.waseda.ac.jp/dspace/index.jsp	Dspace	2005/04/19	2005/11/28
52	Kanto Gakuin University	Kanto Gakuin University Repository	http://opac.kanto-gakuin.ac.jp/en/	iLisSurf	2003/10/01	2005/03/01

No	Organization name	Institutional repository name	URL	Software	Trial release date	Release date
53	Doshisha University	Doshisha University Academic Repository	http://elib.doshisha.ac.jp/english/index.html	iLisSurf e-lib	—	2007/02/26
54	Kansai University	Kansai University Institutional Repository	http://kuir.jm.kansai-u.ac.jp/dspace	Dspace	2007/03/30	2008/04/01
55	Kwansei Gakuin University	Kwansei Gakuin University Repository	http://kgur.kwansei.ac.jp/dspace/index.jsp	Dspace	2007/07/20	2007/10/01
56	Kochi University of Technology	Kochi University of technology Academic Resource Repository	http://kutarr.lib.kochi-tech.ac.jp/dspace/	Dspace	2007/09/05	2007/10/01
57	Ritsumeikan Asia Pacific University	R-Cube	http://r-cube.ritsumei.ac.jp/	Dspace	2008/04/03	2008/04/03
58	Otaru University of Commerce	Otaru University of Commerce Academic Collection	http://barrel.ih.otaru-uc.ac.jp/dspace/?locale=en&lang=en	Dspace	2007/11/07	2008/03/07
59	Iwate University	Iwate University Repository	http://ir.iwate-u.ac.jp/dspace/	Dspace	2007/04/01	2007/08/01
60	Utsunomiya University	Utsunomiya University Academic Information Repository	http://uuair.lib.utsunomiya-u.ac.jp/	Dspace	—	2008/04/01
61	The University of Electro-Communications	学術機関リポジトリ	http://www.lib.uec.ac.jp	Dspace	2008/03/24	—
62	Tokyo University of Marine Science and Technology	Tokyo University of Marine Science and Technology Open Access Collection of International and Scholarly Papers	http://oacis.lib.kaiyodai.ac.jp/	Dspace	2008/03/28	—
63	University of Toyama	University of Toyama Repository	http://utomir.lib.u-toyama.ac.jp/dspace/index.jsp	Dspace	2007/12/26	2008/03/09
64	Shizuoka University	Shizuoka University REpository	http://ir.lib.shizuoka.ac.jp/?locale=en	Dspace	2008/02/29	2008/04/01

No	Organization name	Institutional repository name	URL	Software	Trial release date	Release date
65	Hamamatsu University School of Medicine	HamaMed-Repository	http://hikumano.hama-med.ac.jp/dspace/	Dspace 1.4.2	2008/03/17	2008/06/02
66	Nagoya Institute of Technology	Nagoya Institute of Technology Repository System	http://repo.lib.nitech.ac.jp/?lang=en	NALIS-R	2007/11/07	2008/03/03
67	Kyushu Institute of Technology	Kyushu Institute of Technology of Academic Repository	http://ds.lib.kyutech.ac.jp/dspace/	Dspace	2007/12/07	2008/03/03
68	Tokyo Dental College	Tokyo Dental College Institutional Repository : IRUCCA@TDC	http://ir.tdc.ac.jp/	Dspace	2006/11/15	2008/02/06
69	The Jikei University School of Medicine	The Academic Repository, The Jikei University School of Medicine	http://ir.jikei.ac.jp/	Dspace	2008/03/12	2008/06/12
70	Meiji University	Meiji Repository	http://m-repo.lib.meiji.ac.jp/dspace/	Dspace	—	2008/03/31

2. Area 2: Project outlines

2.1 Projects operating from FY2008-2009

Item		
(1) Project name	Digital Repository Federation	
(2) English abbreviation	DRF	
(3) Project homepage URL	http://drf.lib.hokudai.ac.jp	
(4) Coordinating institutions	Institution name	Principal duties
Principal institution	Hokkaido University	Website development, mailing list operation
Partner institution	Chiba University	Hosting workshops
Partner institution	Kanazawa University	Communication, coordination, etc.
Partner institution		
Partner institution		

(5) Overview of the project

The Digital Repository Federation organized under this project undertook liaison activities centered around information-sharing through a mailing list and website, and exchange activities through workshops and other gatherings.

A total of 394 e-mail addresses were subscribed to the mailing list (including proxy addresses for broadcast distribution), with information exchanged through a total of 1,390 e-mail messages after the list's creation in October 2006. The project website was developed using a Wiki (http://drf.lib.hokudai.ac.jp/), and since its opening in October 2006 has been accessed 16,845 times (top page access only). The website contains announcements and records of gatherings, an introduction to literature on IRs and open access, information on software, and a mailing list archive. The project also organized three workshops on a national scale, one international conference featuring guests from overseas, and three regional workshops focusing on projects and activities in specific regions. These events were well received, and attracted a total of 859 participants.

A report on the abovementioned activities titled *Digital Repository Federation: Activities in FY2006-2007 and Future Prospects* was published in March 2008 and supplied to CSI-commissioned institutions (58 institutions in all), NII and other associated bodies.

Item		
(1) Project name	Access path to Institutional Resources via link resolvers	
(2) English abbreviation	AIRway	
(3) Project homepage URL	http://airway.lib.hokudai.ac.jp	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Hokkaido University	System administration, publicity and promotion
Partner institution	University of Tsukuba	Assistance with publicity and promotion
Partner institution	Chiba University	Assistance with publicity and promotion
Partner institution	Nagoya University	Assistance with publicity and promotion
Partner institution	Kyushu University	Assistance with publicity and promotion

(5) Overview of the project

This is a research and development project that aims to use link resolvers to create an access path to resources available on open access in IRs and elsewhere. The nature of AIRway makes it amenable to widespread use for locating open access resources through OpenURL requests, not only link resolvers.

System linkage with AIRway's server enables link resolvers to guide users who do not possess e-journal subscriber licenses to full-text documents, thus enhancing resource access paths.

By providing their metadata to the AIRway server under OAI-PMH, universities and research institutions that manage IRs can attract users of link resolvers in addition to users of Internet search engines such as Google and OAI-PMH-compliant service providers such as OAIster.

Through these means, the AIRway project aims to further improve the visibility of material held in IRs.

Item		
(1) Project name	A Project on Data Sharing for Achievement Database and Institutional Repository	
(2) English abbreviation	None	
(3) Project homepage URL	http://www.lib.kanazawa-u.ac.jp/kura/achievement/index.html	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Kanazawa University	Coordination of project development, fundamental design
Partner institution	Waseda University	Assistance in fundamental design
Partner institution	Kyushu University	Assistance in fundamental design
Partner institution		
Partner institution		

(5) Overview of the project

Kanazawa University, Waseda University and Kyushu University modeled and implemented two separate programs for collaboration between achievement databases and repositories (DSpace).

Model 1 (Proxy Registration)
Kanazawa University and Waseda University developed and released a DSpace tool by which articles and other content inputted by faculty members into the achievement database are sent to the IR, which then sends back to the achievement database identifier information ("Handles" in DSpace) to enable linkage to IR content from the achievement database.

Model 2 (User Support)
Methods were explored for achieving linkage between the Kyushu University Institutional Repository and the pre-existing achievement database – the Kyushu University Academic Staff Educational and Research Activities Database – without the need for large-scale modification to the database system. In FY2007, the project extended the functionality of the "Article Link System" launched in the previous fiscal year.

Item		
(1) Project name	Society Copyright Policies in Japan	
(2) English abbreviation	SCPJ	
(3) Project homepage URL	http://www.tulips.tsukuba.ac.jp/scpj/	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	University of Tsukuba	Database creation and development
Partner institution	Chiba University	Informational and promotional activities
Partner institution	Kobe University	Questionnaire surveys
Partner institution		
Partner institution		

(5) Overview of the project

Designed to promote the archiving of scholarly documents into IRs, this project addressed the issue of copyright procedures necessary for IRs seeking to archive articles that have appeared in publication issued by academic societies and other associations in Japan. It conducted surveys on societies' consent policies regarding the inclusion of such articles in IRs, and used the results to produce, maintain and make available a "Society Copyright Policy Database." It also conducted an informational and promotional campaign to encourage academic societies to grant permission for IR inclusion.

In FY2007 the project maintained and expanded its FY2006 activities, continuing to conduct surveys of academic society copyright policies, as well as seeking to extend database functions and enhance content through steps such as creating a search function based on publication name and recording the names of all organizations listed in the *Gakkaimeikan* (directory of academic societies). Efforts were also made to influence those involved in academic societies and the publishing industry, producing and distributing a pamphlet directly targeting this group. Furthermore, the project team shared information and opinions with people working at organizations with similar aims to this project outside Japan, as a stepping stone towards cross-border collaboration with these organizations.

Item		
(1) Project name	Tokyo Tech Research Repository(T2R2) Project	
(2) English abbreviation	T2R2 Project	
(3) Project homepage URL	t2r2.star.titech.ac.jp	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Tokyo Institute of Technology	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

This project developed its own T2R2 system, realizing new IR system functions such as those listed below and providing a model that other universities can refer to.

(1) Provision of a diverse range of input support functions linked with university-wide authentication and authorization systems, enabling low-cost input by researchers themselves.

(2) Linkage with university-wide authentication and authorization systems, facilitating not only correlation between the individual inputting the information and the scholarly paper or other item entered, but correlation between the item and all authors from within the university, including co-authors. This function enables management of item duplication.

(3) Accumulation of metadata not only for papers that can be made publicly available in their entirety, but for all papers and books that researchers at the university write, and provision of a variety of usage functions for the researchers themselves. This creates a research output management system (research support tool) for the university's researchers, transcending the mere accumulation and public release of academic information.

(4) On top of the above functions, realization of linkage with the researcher information system (university information database), effectively promoting the input of research achievements required by the university information database.

(5) Use of functions for linkage of data with Tokyo Tech OCW, Tokyo Tech ODM and other systems to realize a coordinated approach to the dispatch of information both within and beyond the university, as well as data linkage with both in-house and external systems, at the same time as developing a distinctive repository attuned to individual content features.

Item		
(1) Project name	Federated Search for Institutional Academic Resources	
(2) English abbreviation	FS Project	
(3) Project homepage URL	http://libra.unknownlabo.com/	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Kyushu University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

Universities possess a wide variety of academic information apart from documents, and several different databases with different purposes may exist within one organization. Users seeking to access academic information, however, are required to identify the location of these databases themselves. Enabling access through a single unified interface would enhance usability and dramatically increase the capacity for dissemination of academic information.

Databases other than IRs do not necessarily hold metadata, and for some databases the provision of metadata is problematic. It is thus impossible simply to roll them all into a single database. This project proposes a model that enables consolidated access, using text-based search technology –which is subject to few restrictions – to create loose connections between many different types of academic information. The use of text-based searching enables text data to be handed as metadata, extending naturally into full-text document searches. User feedback, such as comments on articles, can also be searched as metadata.

Moves are being made throughout the world to treat the IR not simply as a database for academic papers already presented or published, but as a large-scale academic resource database that encompasses content including educational materials and data. This project seeks to furnish a Japanese model for this new type of IR. Another major aim is to demonstrate that in cases where the goal simply involves searching rather than data exchange, the kind of "loose integration" envisaged by this project is better suited than the traditional IR mainstay approach of rigid metadata management.

Item		
(1) Project name	Mutual Exchange of Diverse Metadata Schemes	
(2) English abbreviation	MEDMS	
(3) Project homepage URL	http://info.nul.nagoya-u.ac.jp/pubwiki/index.php?ksconv	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Nagoya University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

This project seeks to develop a uniform method for handling myriad data dispersed across different information services. It takes metadata from different services and converts them to the proper format using appropriate methods depending on the specific characteristics of the metadata, enabling public release under a standardized transmission procedure. This will make it possible for metadata from various services to be exchanged with a uniform procedure.

In FY2006, the project team developed a data conversion program for use with formats such as the metadata standard for academic degree theses and dissertations ETDMS, and the metadata format for open course ware (OCW) Learning Object Metadata (LOM). In the current academic year, this program was restructured into a more generalized format. Rather than offering a conversion program specific to certain select forms of metadata, each processing unit in the data conversion software was formulated as a discrete plug-in module that can be combined to realize data conversion for various types of metadata. This resulted in the development and release of an easy-to-use command-line data conversion program.

The team is now working to develop a tool with a higher level of re-usability.

Item		
(1) Project name	Evaluation of Institutional Repository	
(2) English abbreviation	None	
(3) Project homepage URL	None	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Chiba University	Overall management, formulation of indicators for IR evaluation
Partner institution	Mie University	Formulation of indicators for IR evaluation, development of a statistical processing program for DSpace
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

Continuing on from FY2006 in its quest to develop evaluation indicators and standardize methods for measurement, the project undertook analysis of IR output using web logs.

The aim of this analysis is to develop indicators to gauge the effectiveness of IRs by employing actual usage records to assess the extent to which they are used. The concrete objective for the immediate future is to furnish information and ideas for the enhancement of systems and services use, through (comparative) analysis of reported usage statistics – number of visits, number of visitors, number of pages viewed, number of downloads, frequently used resources, usage channels, and so on.

Using the framework under consideration since last year, IR access logs from 11 universities were analyzed and a process flow was established for converting them into reliable statistical information capable of cross-comparison. In addition, statistical values were obtained through actual procedures including narrowing down status codes and eliminating duplicate counts using a filter developed by the project team itself, and elimination of bot access using AWstats.

The results of this analysis revealed several facets of IR usage, including the fact that IRs are being accessed from many different countries, that a wide range of contents are being used, and that they are being accessed by many different types of institution.

Item		
(1) Project name	Integrated Searching Environment for Education	
(2) English abbreviation	ISee	
(3) Project homepage URL	http://miuse.mie-u.ac.jp/hbs/	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Mie University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

The purpose of this project is to use the creation of integrated search functions as the basis for examining IR usability in the contexts of learning, education and research, at the same time as identifying the necessary conditions for function and content to promote the effective use of IRs.

In concrete terms, the project's initial task is to develop an integrated search system for myriad academic resources accumulated and distributed both within and outside the university. An academic environment is being created to support the entire spectrum of access pathways for discovering, obtaining and using academic information by realizing an integrated search of institutional repositories, databases, and search engines. This system is equipped with a dedicated interface that allows each user to customize search objects and screen layout, and is also linked with the university's Course Management System, web syllabus and other internal online resources for education and learning, thus assessing the usability of IRs and integrated search functions in the education and learning contexts and identifying functional requirements relating thereto.

Item		
(1) Project name	Invoking Co-evolutional Academic Research and Education	
(2) English abbreviation	I-CARE	
(3) Project homepage URL	http://cures.ll.chiba-u.jp/ (experimental site)	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Chiba University	Support for sharing information of use in research and education, promotion of content sharing, support for reciprocal information circulation
Partner institution	Kyushu University	Storage and provision of extended metadata
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

This project aimed to furnish support for the emergence of a research community formed organically around IRs. It involved the consolidated use of existing databases in the development of technology for bottom-up construction of "linkages" attuned to different goals and objectives, and the implementation of a system for this purpose. The system accorded only minimal attention to "information management" issues, instead furnishing infrastructure for individual researchers (participants) to provide information to the IR and researcher information databases and thereby augment the "circulation of information" function required by these researchers themselves.

The agenda for bottom-up organization involved two interdependent aspects: (1) to trigger the process of inputting research and educational products into the IRs and instigate a community with the capacity for information circulation; (2) to develop the functions required for circulation to take place.

In regards to (1), with a view to providing assistance for research advancement and research funding access, the project team created a prototype system for visualizing and tendering latent communities from information in the Chiba University Achievement Database, as well as undertaking functional analysis of the Connotea software for sharing information on academic references. Primarily utilizing the subject syllabus used by students, a demonstrative trial was conducted to identify communities of faculty members in subjects across several different departments as a unique social networking service.

In regards to (2), results of a survey analyzing the research interests of faculty members, primarily those at Kyushu University, have been used as the basis for the creation of an evaluation version of a system for resource correlation and academic document version management. The project team has now begun linking this system to the Kyushu University SNS.

Item		
(1) Project name	Development of a Journal Editing and Publishing System	
(2) English abbreviation	ePubs	
(3) Project homepage URL	http://www.wul.waseda.ac.jp/ir/epubs/	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Waseda University	Planning, surveys (case studies from Japan and overseas: OJS etc.), development, testing
Partner institution	Hiroshima University	Surveys (fact-finding survey on internal periodical publications and overseas case studies: Dpubs etc.), testing
Partner institution	Nagasaki University	Surveys (fact-finding survey on internal periodical publications and overseas case studies), testing

(5) Overview of the project

1. Outline

Entering bulletins and other in-house periodicals into a repository entails a huge effort, and there is no guarantee that such an effort will be sustained. This project aims to develop the first ever free-of-charge electronic publishing system in the Japanese language (also equipped with editing and referee functions), enabling in-house university periodicals and other scholarly content to be loaded onto repositories on an ongoing basis.

After analyzing a variety of pre-existing e-publishing systems, the project team decided to base development of their new system on the Open Journal System (OJS), an open source editing, refereeing and publishing system created by the Public Knowledge Project (PKP).

2. Summary of project elements

Following the outline above, the project involved the following tasks towards development of an e-publishing system.

(1) To perform trial operation and evaluation on a prototype developed in the period up to FY2006, and to form partnerships with the OJS community and bring the e-publishing system to completion;
(2) To make the e-publishing system that has been developed available to the public free of charge;
(3) To lobby in-house publishing organizations to make use of the e-publishing system;
(4) To explore policies for operation, maintenance and usage promotion.

Item		
(1) Project name	Name Authority Resolution System	
(2) English abbreviation	NARS	
(3) Project homepage URL	http://info.nul.nagoya-u.ac.jp/pubwiki/index.php?ANDISC	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Nagoya University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

This project is developing a "Name Authority Resolution System" to resolve problems of discrepancy in the notation of authors' names arising from the peculiarities of each system. In addition to resolving ambiguities in name notation within single systems, the Name Authority Resolution System aims to resolve name ambiguities and link records across different systems.

In concrete terms, the project is creating a web-based service that, when a user issues a request containing author name parameters, identifies the author name and redirects it with the appropriate parameters to the required link. The system incorporates a database equipped with the information required to perform these author name identification and redirection tasks.

The feature of this system is that it can be incorporated with only minimal modification to existing systems, making cross-linking using author names possible among disparate systems between which linking was formerly considered difficult.

Item		
(1) Project name	Development of a XooNIps Library module	
(2) English abbreviation	None	
(3) Project homepage URL	http://sourceforge.jp/projects/xoonips-library/ (developers' site)	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Keio University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

This project performed renovations and functional extensions to the XooNIps Library Module that is used as the system platform for KOARA (KeiO Associated Repository of Academic resources) – the IR at Keio University – and IRs in other university and public libraries. Responding to the increasing diversity of institutions using the Library Module and the growing need to furnish and share information and to develop a more organized grasp of different requirements, the project also launched a XooNIps study group together with RIKEN, XooNIps' original developer, and workshops were held on two occasions.

In addition, linkages between KOARA and external systems were evaluated and verified, and functions with general applicability were designed for integration into the Library Module.

The following specific tasks were undertaken:

1) Renovating, expanding functions and repairing bugs in the Library Module to coincide with the XooNIps renewal conducted in partnership with RIKEN;
2) Collecting demands and requests from other organizations using the Library Module and communicating them to RIKEN as a combined library opinion;
3) Starting a XooNIps study group, and organizing two workshops to promote the use of XooNIps and the Library Module and to share information thereon;
4) Evaluating linkage between XooNIps and other systems.

Item		
(1) Project name	User interface by correlation map of controled keywords	
(2) English abbreviation	None	
(3) Project homepage URL	http://eprints.lib.hokudai.ac.jp/navi/	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Hokkaido University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

This project involved trials to make the correlations visible between different content items in HUSCAP, the IR at Hokkaido University. This was implemented under a policy of proximate display of the distance between different articles that share the same keywords.

In particular, the use of controlled keywords for articles appearing in journals included in Web of Science, which comprises an important part of HUSCAP's content, yielded meaningful results . Visualization was achieved through use of the graph generation tool Graphviz.

At a meeting of the Subcommittee on Academic Information Transmission held in March, members practicing in several different fields provided feedback on this project.

2.2 Projects operating in FY2008 only

Item		
(1) Project name	Project for establishing a repository focused on educational contents of Tohoku University	
(2) English abbreviation	None	
(3) Project homepage URL	None	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Tohoku University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

Highlighting our university's attributes as an eminent educational institution, this project will initiate the creation of a repository with content focused on achievements in education. There is very little record of full-scale initiatives in this area up to FY2007: this project will constitute an exploration of new possibilities for the "repository" system. (The above text is extracted from the Project Proposal Form.)

In practice the concept is to accumulate academic degree theses and dissertations as the primary form of educational output. The Academic Information Strategy Meeting, a faculty investigative body established in FY2006, also concluded that this approach should be given priority for the following reasons:

- Theses and dissertations often contain information that is of value in academic research;
- They are currently stored under many different conditions and there are no uniform conditions for their use;
- There is currently no resource at Tohoku University that provides an overview of output to date.

It is hoped that this initiative will furnish a wider range of options regarding the future direction of the repository, which was originally developed around articles published in academic journals. In addition, the system developed in this project has customized features to aid input, including a function to specify the date of release, and can thus offer an aid to other institutions considering similar initiatives.

Item		
(1) Project name	Coordination of international cooperation in view of improving the scholarly communication infrastructure in Japan	
(2) English abbreviation	None	
(3) Project homepage URL	None	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Chiba University	International symposium planning
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

Set against the challenges in information infrastructure being addressed by higher education, research and governmental institutions as well as academic societies and associations, this project contributed to the organization of an international symposium to develop a shared outlook on the future of academic and scholarly communication. Experts were invited from both within and outside Japan and discussion took place on the following issues:

1) Using institutional repositories as the basis for advancing scientific research and sharing information in the evolving digital environment as typified by e-Science.
2) New possibilities beyond conventional publication methods, copyright issues, and other challenges in relation to the dissemination of scientific and scholarly research outcomes.
3) The effect these developments will have on the nature of higher education institutions.

A Keynote Speech by Daniel Greenstein was followed by presentations on Institutional Repositories: Evolving Infrastructure for Research (Session 1), Research Publishing: Evaluating, Accessing, Disseminating (Session 2) and The Challenge of Digital Resources for Higher Education (Session 3). 290 people registered to attend the symposium, with actual attendance at each item in the program as follows: Keynote address – 200; Session 1 – 200; Session 2 – 150; Session 3 – 120.

Item		
(1) Project name	Development of UT Repository registration and management system	
(2) English abbreviation	None	
(3) Project homepage URL	None	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	The University of Tokyo	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

The University of Tokyo has developed and delivers services through the "UT Repository" utilizing the Japanese language version of the IR software DSpace.

It is a troublesome and awkward task for researchers themselves to add content to IRs through the DSpace interface. To avoid this imposition on researchers, in practice content is usually added by members of staff from the Information Technology Center. However, there is no function in DSpace for managing copyright permissions relating to full-text content, making it necessary to manage information on copyright permissions on personal computers or other local systems. For an IR that incorporates a wide variety of content, this kind of local management outside the core system can result in different types of content each being managed differently, creating a bottleneck when the IR comes to handle content in large volumes. This project aims to develop a system equipped with functions for managing copyright permission data on content added to the IR and connecting this with the public DSpace platform, allowing the process of adding content to be managed more efficiently.

The key points in development of this system are as follows:

- Design and implementation of a database for managing copyright permission data;
- Development of a function to prevent the addition of content for which copyright permission is inadequate;
- Development of a function to identify contents for which copyright permission has not been granted;
- Development of a function for date-specified automatic addition of content with a predetermined release date.

Item		
(1) Project name	Development of Education Subject Repository	
(2) English abbreviation	None	
(3) Project homepage URL	None	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Tokyo Gakugei University	
Partner institution	National universities of education, etc.	
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

It is envisaged that from now on, many institutions will move to establish IRs that collect and furnish a wide variety of information. Researchers in the field of education, however, will need an efficient means for capturing education-related information from these collections. This project addresses this need by designating Tokyo Gakugei University's IR as an Education Subject Repository, and examining and implementing measures for gathering not only research output at this university, but also products of education-related research from a wide range of other institutions that specialize in education. To this end, Tokyo Gakugei University is working in partnership with other universities of education to explore issues such as standards for the creation of metadata attuned to the characteristics of education-related information, and methods for capturing education-related metadata using OAI-PMH. The project also involves the creation of a system for all-inclusive entry of information on education-related research achievements without requiring university faculty members to exert undue effort, alongside improvements to the interface for provision of this information.

Item		
(1) Project name	Development of "OneWriting & MultiOutput system"	
(2) English abbreviation	None	
(3) Project homepage URL	None	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Ochanomizu University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

This project institutes the "OneWriting & MultiOutput System" for information on education and research products generated within the university, thereby reducing the time and cost drain on both academic and administrative staff involved in accumulating and disseminating this information. Linkage and integration with pre-existing university information systems will enable education and research information assets already accumulated by each department and division to be utilized more economically. This will furnish a model system for development and administration of the "accumulation and dissemination of content" in other small-scale universities similar to our own

In FY2006, with a view to linkage and unification with the university's existing systems and databases (including the database for evaluation of faculty members' activities and the database of faculty members), the project team carried out detailed surveys on each database and system, and started work on designing the new system.

Item		
(1) Project name	Construction and release of mathematical literature archive	
(2) English abbreviation	None	
(3) Project homepage URL	None	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Kyoto University	Adding the Research Institute for Mathematical Sciences *Kôkyûroku* to the IR
Partner institution	Hokkaido University	Harvesting from projecteuclid.org, etc.
Partner institution	The University of Tokyo	Adding European-language publications of the Graduate School of Mathematical Sciences to the IR
Partner institution		
Partner institution		

(5) Overview of the project

This is a project to formulate a course of action for creation of content in the field of mathematics within Japan. It involves collaboration between three institutions: Hokkaido University's Department of Mathematics, the University of Tokyo, and Kyoto University.

Hokkaido University collects content in the form of metadata through OAI-PMH compliant harvesting of sources including projecteuclid.org, used as the platform for periodicals selected for inclusion in SPARC Japan, and the preprint server arxiv.org.

The University of Tokyo provides support for preparing the *Journal of Mathematical Sciences, The University of Tokyo* (JMS) for public release through the UT Repository. This publication, an English-language journal issued by the university's Graduate School of Mathematical Sciences, is one of Japan's few international journals in the mathematical sciences. Making it available publicly through the IR is a highly significant move in terms of content development in the field of mathematics in this country.

Kyoto University is adding to its IR the *Kôkyûroku*, a series that has been published continuously by since 1967. *Kôkyûroku* contains records of research workshops and colloquia organized as communal initiatives by the Kyoto University's Research Institute for Mathematical Sciences, a national joint-use research facility. It is a precious resource that provides an overview of more than 40 years of progress on mathematical research in Japan.

Item		
(1) Project name	Development of a cooperative institutional repository for load reduction on registering information	
(2) English abbreviation	None	
(3) Project homepage URL	http://ir.library.osaka-u.ac.jp/	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Osaka University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

By developing connections between the IR and other academic information systems already being used within the university, this project aims to secure greater ease of use for researchers entering content to the university's IR themselves. It will also conduct research and development on, and actual application of, ways to make the process of inputting data provided by researchers simpler and more convenient for those members of library staff who provide support for IR content entry. In concrete terms this involves linkage with the university's basic system for unified authentication to realize an arrangement whereby users logged into other university systems can access the IR without the need for further logins (a "single sign-on" feature). It is envisaged that this will encourage greater use of the IR. The project will also seek to reduce the burden on both those adding content and those accessing the IR. This involves furnishing support for addition of bibliographic data through linkage with the library operations system and exploring ways to make the process of adding content more efficient by connecting the IR to other internal systems such as the basic faculty data collection module, as well as realizing greater efficiency in the area of copyright processing. The project will thus identify issues to be addressed in the course of creating an integrated system.

To date there have only been a few instances of system development for the purpose of reducing the burden of data entry in IR systems. If linking the IR to the single sign-on function proves effective in encouraging the addition of more content, other institutions will also be prompted to trial introduction of the single sign-on model in their own IRs, and the conditions for more active use of IR systems will be realized.

Item		
(1) Project name	Peace Studies Repositories Project	
(2) English abbreviation	PAIR	
(3) Project homepage URL	http://www.lib.hiroshima-u.ac.jp/pair/pair.html	
(4) Coordinating institution(s)	Institution name	Principal duties
Principal institution	Hiroshima University	
Partner institution		
Partner institution		
Partner institution		
Partner institution		

(5) Overview of the project

Founded on Hiroshima University's guiding principle of "the pursuit of peace," this project aims to create a peace studies repository as a distinctive form of IR. This involves the following tasks.

1. Rather than simply gathering together materials related to peace studies produced by organs within the university, the project seeks to contribute to the creation and distribution of new peace studies materials. To this end, it is translating and publishing for release on the IR the SIPRI Yearbook, produced by the Stockholm International Peace Research Institute (SIPRI), a world-renowned authority on arms reduction. Additionally, the project contributes to teaching and research on peace studies by producing a Japanese language version of the SIPRI database of Facts on International Relations and Security Trends (FIRST), and developing a peace studies portal site integrating the peace studies repository and other sources of information on peace studies.
2. The Hiroshima Associated Repository Project (HARP) will be launched by university libraries within Hiroshima prefecture. HARP will conduct experimental development with the aims of involving more IRs and expanding content, and bring together materials related to peace studies held at university libraries throughout the prefecture.
3. By combining 1 and 2 above, the project aims to become a comprehensive source of scholarly works on peace studies, contributing to the advancement of peace studies research both within Japan and elsewhere. It is also believed that the project can furnish a model for the creation of joint repositories.

3. Relevant advisory council reports, etc.

- *Daigaku toshokan ni okeru denshi toshokanteki kinô no jûjitsu/kyôka ni tsuite (kengi)* [Enhancement and Strengthening of Electronic Library Functions in University Libraries (Proposal)]
  July 29, 1996 Science Council
  http://wwwsoc.nii.ac.jp/anul/j/documents/mext/kengi.html

- *Gakujutsu jôhô no ryûtsû kiban no jûjitsu ni tsuite (shingi matome)* [Enhancing the Distribution Infrastructures for Scholarly Information (A Summary of the Deliberation)]
  March 12, 2002 Working Group on Digital Research Information Infrastructure, Information Science and Technology Committee, Subdivision on Research Planning and Evaluation, Council for Science and Technology
  http://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu2/toushin/020401.htm

- *Gakujutsu jôhô hasshin ni muketa daigaku toshokan kinô no kaizen ni tsuite (hôkokusho)* [Improving Library Functions for Dissemination of Scholarly Information (Report)]
  March 17, 2003 Information Division, Research Promotion Bureau, Ministry of Education, Culture, Sports, Science and Technology
  http://wwwsoc.nii.ac.jp/anul/j/documents/mext/kaizen.pdf

- *Denshi toshokan no aratana chôryû* [New Trends of Digital Library]
  May 29, 2003 Special Committee's Working Group on Library Advancement, Japan Association of National University Libraries
  http://wwwsoc.nii.ac.jp/anul/j/publications/reports/74.pdf

- Toward the Advancement of Digital Library Functions: a New Role of University Library in the Age of Digitalization of Scholarly Information (Interim Report of Digital Contents Project)
  June 2005 Digital Contents Project, Committee on Scholarly Information, Japan Association of National University Libraries
  http://wwwsoc.nii.ac.jp/anul/j/projects/si/dc_chukan_hokoku.pdf

- *Gakujutsu jôhô kiban no kongo no arikata ni tsuite (hôkoku)* [Ideal Ways of Scholarly Information Infrastructures in the future (report)]
  March 23, 2006 Working Group on Scientific Information Infrastructure, Research Environment and Infrastructure Committee, Subdivision on Science, Council for Science and Technology, Council for Science and Technology
  http://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu4/toushin/06041015.htm

・ Toward the Advancement of Digital Library Functions 2: Activities of University Library in the Age of Digitalization of Scholarly Information (Second Interim Report of Digital Contents Project)
June 2006 Digital Contents Project, Committee on Scholarly Information, Japan Association of National University Libraries
http://wwwsoc.nii.ac.jp/anul/j/projects/si/dc_chukan_hokoku_2.pdf

・ Toward the Advancement of Digital Library Functions 3: a New Role of University Library in the Age of Digitalization of Scholarly Information (Final Report of Digital Contents Project)
October 2007 Digital Contents Project, Committee on Scholarly Information, Japan Association of National University Libraries
http://wwwsoc.nii.ac.jp/anul/j/projects/si/dc_lastreport.pdf

4. Working Committee activity records

4.1 FY2005 Institutional Repository Working Committee

(1) Committee members

Name	Affiliation / Position	Notes
Takao Namiki	Assistant Professor, Graduate School of Science and Faculty of Science, Hokkaido University	
Norihiko Uda	Associate Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	
Sachiyo Arai	Associate Professor, Department of Urban Environment Systems, Faculty of Engineering, Chiba University	
Ikuo Sasakawa	Executive Director, University of Tokyo Library System	
Haruo Yokota	Professor, Global Scientific and Information Computing Center, Tokyo Institute of Technology	
Satoru Kinoshita	Manager, Library Services Division, Information Department, Kanazawa University	
Hiroshi Itsumura	Associate Professor, Nagoya University Library Studies	
Yoshinori Sato	Professor, Faculty of Humanities, Law and Economics, Mie University	
Hirokazu Ohno	Administrative Director, Kyoto University Library	
Takeshi Hiramoto	Director General, Hiroshima University Library	
Daisuke Ikeda	Associate Professor, Research and Development Division, Kyushu University Library	
Masamitsu Negishi	Director, International and Research Cooperation Department, National Institute of Informatics	Chair
Jun Adachi	Director, Development and Operations Department, National Institute of Informatics	
Kazunobu Konishi	Associate Director, Development and Operations Department, National Institute of Informatics	

(2) Meetings and agendas

FY2005 Meeting 1: Monday March 6, 2006

1. Overall perspective on academic content development and dissemination infrastructure; application guidelines (framework proposal)
2. Application schedule for FY2006 CSI-commissioned projects
3. Implementation status of FY2005 CSI-commissioned projects
4. The future of the Metadata Database Joint Development Project
5. Survey on research activity and open access

6. Questionnaire survey on handling of copyright and other issues

FY2005 Meeting 2: Wednesday March 29, 2006

1. Proposed application guidelines for Next Generation Academic Information Infrastructure commissioned projects
2. Proposed schedule for screening and selection of above applications
3. Procedures for screening and selection of above applications
4. Schedule for the Institutional Repository Working Committee in FY2006

4.2 FY2006 Institutional Repository Working Committee

(1) Committee members

Name	Affiliation / Position	Notes
Takao Namiki	Assistant Professor, Department of Mathematics, Graduate School of Science, Hokkaido University	
Hiroshi Itsumura	Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	
Norihiko Uda	Associate Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	
Sachiyo Arai	Associate Professor, Department of Urban Environment Systems, Faculty of Engineering, Chiba University	
Ikuo Sasakawa	Executive Director, University of Tokyo Library System	
Haruo Yokota	Professor, Global Scientific and Information Computing Center, Tokyo Institute of Technology	
Satoru Kinoshita	Manager, Information Planning Division, Information Department, Kanazawa University	
Masanori Akiyama	Associate Professor, Nagoya University Library Studies	
Yoshinori Sato	Professor, Faculty of Humanities, Law and Economics, Mie University	
Hirokazu Ono	Administrative Director, Kyoto University Library	
Takeshi Hiramoto	Administrative Director, Osaka University Library	
Daisuke Ikeda	Associate Professor, Graduate School of Information Science and Electrical Engineering, Kyushu University	
Makoto Nakamoto	Manager, General Affairs Department, Waseda University Library	
Masamitsu Negishi	Professor, National Institute of Informatics	Chair
Jun Adachi	Director, Development and Operations Department, National Institute of Informatics	
Kazunobu Konishi	Associate Director, Development and Operations Department, National Institute of Informatics	

(2) Meetings and agendas

FY2006 Meeting 1: Monday May 15, 2006

1. Selection guidelines and evaluation criteria for Next Generation Academic Information Infrastructure commissioned project proposals
2. 2005 CSI-commissioned projects debriefing and discussion meeting
3. Report on the information session for Next Generation Academic

Information Infrastructure commissioned project applications
4. International symposium on digital repositories
5. “Open House” at the National Institute for Informatics

FY2006 Meeting 2: Friday June 23, 2006

1. Evaluation and selection of Next Generation Academic Information Infrastructure commissioned project proposals
2. Outcomes of CSI-commissioned projects in FY2005
3. FY2005 CSI-commissioned project outcomes debriefing and discussion meeting
4. National Institute of Informatics “Open House” symposium

FY2006 Meeting 3: Thursday August 3, 2006

1. Developments to date and current status of FY2006 commissioned projects
2. Advancement of FY2006 commissioned projects

FY2006 Meeting 4: Tuesday September 26, 2006

1. Project implementation plan proposals
2. Framework for interim report on commissioned projects
3. Schedule for commissioned projects from now on
4. Assistance for commissioned projects
5. Development of an institutional repository portal
6. Report on trends in commissioned projects

FY2006 Meeting 5: Monday December 11, 2006

1. Production of FY2006 interim review
2. FY2006 project report
3. Towards FY2007
4. Trends in commissioned projects
5. JuNii+
6. International symposium

FY2006 Meeting 6: Thursday March 15, 2007

1. FY2006 CSI-commissioned projects interim review
2. Supplementary call for applications for FY2007 CSI-commissioned projects
3. Trends in FY2006 commissioned projects
4. Schedule for CSI-commissioned projects from now on

4.3 FY2007 Institutional Repository Working Committee

The Committee met once in FY2007. The Committee disbanded as of this meeting, and a new Library Liaison Working Committee was established.

(1) Committee members

Name	Affiliation / Position	Notes
Takao Namiki	Associate Professor, Department of Mathematics, Graduate School of Science, Hokkaido University	
Hiroshi Itsumura	Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	
Norihiko Uda	Associate Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	
Sachiyo Arai	Associate Professor, Department of Urban Environment Systems, Faculty of Engineering, Chiba University	
Haruo Yokota	Professor, Global Scientific and Information Computing Center, Tokyo Institute of Technology	
Satoru Kinoshita	Manager, Information Planning Division, Information Department, Kanazawa University	
Takeshi Hiramoto	Administrative Director, Osaka University Library	
Daisuke Ikeda	Associate Professor, Graduate School of Information Science and Electrical Engineering, Kyushu University	
Yoshinori Sato	Professor, Faculty of Humanities, Law and Economics, Mie University	
Makoto Nakamoto	Associate Administrative Director and Manager, General Affairs Department, Waseda University Library	
Masamitsu Negishi	Professor, Information and Society Research Division, National Institute of Informatics	Chair
Jun Adachi	Director, Cyber Science Infrastructure Development Department, National Institute of Informatics	
Hitoshi Hayase	Associate Director, Cyber Science Infrastructure Development Department, National Institute of Informatics	

(2) Meetings and agendas

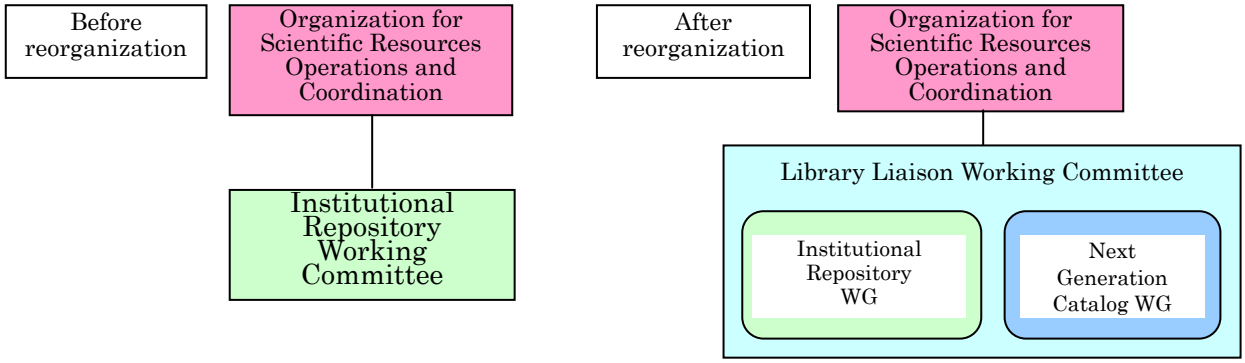
FY2006 Meeting 1: Tuesday May 22, 2007

1. Evaluation and screening of FY2007 Next Generation Academic Information Infrastructure commissioned project proposals
2. The future of this Working Committee

3. Related events
4. Trial release of JuNii+

4.4 FY2007 Library Liaison Working Committee

This Working Committee's mission is to liaise with university libraries and promote the collaborative development of infrastructure for next-generation academic information. Two working groups have been established within the committee: the Institutional Repository Working Group and the Next Generation Catalog Working Group.



(1) Committee members

Name	Affiliation / Position	Notes
Takao Namiki	Associate Professor, Department of Mathematics, Graduate School of Science, Hokkaido University	IR
Shinya Kato	Manager, General Affairs Department, Tohoku University Library	Catalog
Hiroshi Itsumura	Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	IR (Chief)
Norihiko Uda	Associate Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	IR
Sachiyo Arai	Associate Professor, Department of Urban Environment Systems, Faculty of Engineering, Chiba University	IR
Hiroya Takeuchi	Associate Professor, Faculty of Letters, Chiba University	Catalog
Kazuo Yamamoto	Library Specialist, General Affairs Division, University of Tokyo Library System	Catalog
Haruo Yokota	Professor, Global Scientific and Information Computing Center, Tokyo Institute of Technology	IR
Satoru Kinoshita	Manager, Information Planning Department, Information Division, Kanazawa University	IR
Hitoshi Terai	Associate Professor, Nagoya University Library Studies	IR
Fumiko Shima	Library Specialist, General Affairs Department, Kyoto University Library	IR

Takeshi Hiramoto	Administrative Director, Osaka University Library	IR
Daisuke Ikeda	Associate Professor, Graduate School of Information Science and Electrical Engineering, Kyushu University	IR
Yoshinori Sato	Professor, Faculty of Letters, Tohoku Gakuin University	Catalog (Chief)
Makoto Nakamoto	Associate Administrative Director and Manager, General Affairs Department, Waseda University Library	IR
Yasuko Murakami	Associate Professor, Faculty of Letters, Kansai University	Catalog
Takahiro Watanabe	Associate Professor, Faculty of Human and Cultural Studies, Tezukayama Gakuin University	Catalog
Masamitsu Negishi	Professor, National Institute of Informatics	Chair
Jun Adachi	Director, Cyber Science Infrastructure Development Department, National Institute of Informatics	
Keizo Oyama	Professor, National Institute of Informatics	
Kazutsuna Yamaji	Associate Professor, National Institute of Informatics	
Hitoshi Hayase	Associate Director, Cyber Science Infrastructure Development Department, National Institute of Informatics	

(2) Meetings and agendas

FY2007 Meeting 1: Monday July 2, 2007

1. About the Library Liaison Working Committee
2. Overall schedule from now on

FY2007 IRWG 1: Monday July 2, 2007

1. The CSI program from now on
2. FY2006 CSI-commissioned projects debriefing and discussion meeting
3. FY2007 Academic Portal Training Course
4. National Institute of Informatics Open House CSI Workshop: “First step of Institutional Repositories”

FY2007 IRWG 2: Friday September 7, 2007

1. FY2006 CSI-commissioned projects debriefing and discussion meeting
2. Promoting CSI from now on

FY2007 IRWG 3: Thursday September 20, 2007

1. Call for applications for FY2008 CSI-commissioned projects

FY2007 Meeting 2: Monday October 15, 2007

1. NII Institutional Repositories Program: Call for applications for FY2008 commissioned projects
2. Review of institutional repository metadata formats
3. Interim Report on Next Generation Catalog Information Service from a Medium and Long Term Perspective
4. FY2008 execution of the Union Catalog Database Retroactive Input Project
5. Report on Library Forum 2007

FY2007 Meeting 3: Thursday January 17, 2007

1. Analysis of the current state of institutional repositories
2. Activities of the working group on digitization of academic articles and papers
3. NII Institutional Repositories Program: Call for applications for FY2008-9 commissioned projects
4. Strategies for popularizing institutional repositories
5. Challenges for institutional repositories
6. Joint workshop for the Japan Association of National University Libraries Committee on Scholarly Information and the National Institute of Informatics Library Liaison Committee
7. Report on progress in the Next Generation Catalog Working Group

FY2007 Meeting 4: Tuesday February 26, 2008

1. NII Institutional Repositories Program: Screening and selection of FY2008-9 commissioned projects
2. Next Generation Academic Information Infrastructure program: Report on FY2007 commissioned projects
3. Current state of institutional repositories
4. The future of institutional repositories
5. Selection for the FY2008 Union Catalog Database Retroactive Input Project
6. Prospects for Next Generation Catalog Information Service (Interim Report)

FY2007 Next Generation Academic Information Infrastructure Commissioned Project Proposal Form

March 2007
National Institute of Informatics

Sheet 1

FY2007 Next Generation Academic Information Infrastructure Commissioned Project Proposal Form

April ___, 2007

To: Organization for Scientific Resources Operations and Coordination

Project name:

Applicant: [stamp]

I hereby submit a proposal for a Next Generation Academic Information Infrastructure commissioned project. Details are enclosed herewith.

Sheet 2. Applicant Institution and Outline of the Repository

1. Applicant institution

Institution name	

Address		
Project Leader	Job title:	Name:
Responsible Parties	Head of operations Job title: Telephone:	 Name: Fax:
	Administrative head Job title: Telephone:	 Name: Fax:

2. Structures and systems for implementation

3. Institutional repository

Name	
Public URL	(tentative)
Base URL	(tentative)
Trial release	(tentative)
General release	(tentative)

(1) System outline

(2) Content

Please enter the numbers of metadata (bibliographic and other secondary data) currently included in the institutional repository in the upper cells. In the lower cells please enter the number of actual items of content linked to these metadata.

Content items should only be counted if they are contained in the institutional repository itself or in other servers administered by the same university.

Please only include metadata and content items that are available for unconditional public access and not subject to any temporal or spatial restrictions.

Content that does not fall into any of the given categories and content that requires special mention (digitized rare works, ancient documents, special collections, etc.) can be entered in the "others" row.

Number of items of content

Category	Number of items*	Number of items to be generated in FY2007 (tentative)
Academic journal articles		
Dissertations and theses		
Bulletin articles		
Conference papers		
Conference materials		
Books and book chapters		
Technical reports		
Research reports		
Non-academic periodical articles		
Preprints		
Teaching materials		
Data/databases		
Software		
Others ( )		
TOTAL		

* For already established repositories, please enter the number of items currently available in the repository. For repositories scheduled for construction from now on, please enter the number of items which are ready for inclusion in the repository, with digitization, copyright processing and other preparations completed.

(3) System management and operation regime

(4) Current status of preparations for operation

Sheet 3. Project Plan

1. Outline of the project

Project aims

Yearly plan: FY2007

2. Plans for operation after termination of the project (FY2008 and beyond)

3. Necessary expenses

(1) Overall expenses

	Facilities & equipment (unit: 1000 yen)	Personnel (unit: 1000 yen)	Operating (unit: 1000 yen)	Total (unit: 1000 yen)
FY2007				
(funds raised by applicant)				
Sub-total (incl. funds raised by applicant)				

(2) Facilities & equipment expenses

Details of facilities & equipment expenses (amounts in units of 1000 yen)		
Fiscal year	Item / specification (number of items x unit cost) (institution installing item)	Amount
2007		
	TOTAL	

(3) Personnel expenses

Details of personnel expenses (amounts in units of 1000 yen)			
2007	Research staff		
	Administrative/clerical staff		
	Ancillary personnel expenses		
	Total		
TOTAL			

(4) Operating expenses

Details of operating expenses (amounts in units of 1000 yen)		
2007		
	TOTAL	

March 19, 2007
Institutional Repository Working Committee

FY2007 Next Generation Academic Information Infrastructure Commissioned Project Proposal Selection Guidelines

The National Institute of Informatics is making an open call for applications for commissioned projects that support the creation of institutional repositories in universities and linkage between these repositories. The purpose of commissioning these projects is to sustain and expand the Institute's content-related programs and contribute to the development of next-generation academic infrastructure.

Project proposals will be screened and selected in accordance with the following guidelines.

I. Selection Policy

Examination of Next Generation Academic Information Infrastructure Commissioned Project Proposal Forms (hereinafter called "Proposals") shall pay regard to the following matters stated in the application guidelines.

Area 1

One of the following two conditions must be met:

(a) The proposal promotes the creation and operation of an institutional repository that makes best use of the university's distinctive attributes, with the aim of discharging the university's social accountability by enhancing its capacity for information transmission and increasing the visibility of its educational and research activities.

(b) If the institutional repository already exists, the proposal seeks to expand and augment the content of this repository.

II. Selection Process

1. Examination of proposal documents by committee members

The secretariat shall select examiners from among members of the Institutional Repository Working Committee, excluding those with interests in the university submitting the proposal. In order to reflect external views and opinions, committee members from the National Institute of Informatics shall also be excluded. Each proposal shall be screened by three examiners.

Each examiner shall assess the proposal in accordance with the Evaluation

Criteria stipulated separately to this document, and enter marks on an evaluation sheet. Examiners may contact the applicant university via the secretariat to obtain further details where required in the course of screening.

Completed evaluation sheets shall be presented to the Institutional Repository Working Committee as materials to inform selection, together with a table of evaluation results prepared by the secretariat.

2. Adjudicative review by the Institutional Repository Working Committee

Based on the documentary examination results provided by the examiners and the table of evaluation results produced by the secretariat, the Committee shall conduct a review to assess the impartiality and validity of the marks awarded by each examiner and the overall marks awarded. As required, hearings may be arranged with applicant universities to obtain further information regarding the proposal. These results shall be classified and presented from the Chair of the Institutional Repository Working Committee to the Organization for Scientific Resources Operations and Coordination in the form of a list of candidates for selection.

3. Deliberation and final selection by the Organization for Scientific Resources Operations and Coordination

Referring to the list of candidates for selection provided by the Institutional Repository Working Committee, the Organization for Scientific Resources Operations and Coordination shall make the final determination regarding selection of proposals by common consent. If necessary in the course its deliberations, the Organization may seek further explanation from the Chair of the Institutional Repository Working Committee.

Following this final determination, selection results shall be published on the website and elsewhere under the name of the Director of the Organization for Scientific Resources Operations and Coordination. Applicant universities shall also be notified of selection results. Reasons shall be provided for proposals that were not selected.

III. Other Matters

1. Disclosure and public release
   (a) The processes of documentary examination by examiners and review by the Institutional Repository Working Committee shall not be made public.
   (b) The process of selecting proposals by the Organization for Scientific

Resources Operations and Coordination shall not be made public.

(c) Following final selection of proposals, selection results shall be made available for public perusal by means including publication on the website.

2. Assessment of expenses

Project expenses shall be assessed following selection by the secretariat, taking into account the information provided in proposal documents.

March 19, 2007
Institutional Repository Working Committee

FY2007 Next Generation Academic Information Infrastructure Commissioned Project Proposal Evaluation Criteria

These evaluation criteria shall be followed by examiners engaged in the examination of Next Generation Academic Information Infrastructure project proposal documents.

1. Each examiner shall award marks for each item under "2. Evaluation items" by reference to "3. Focus points for selection."
   Marks shall be awarded on a five-point scale consisting of 5 (highest), 4, 3, 2, and 1 (lowest).
   Overall evaluation shall also employ a five-point scale consisting of 5 (highest), 4, 3, 2, and 1 (lowest).

2. Evaluation items

(1) Proposal Sheet 2: Current status of and plans for creation of the institutional repository
   (a) Structures and systems for implementation, system outline, content, system management and operation regime

(2) Proposal Sheet 3: Conceptualization and viability of the proposal, operation plan, etc.
   (a) Project aims
   (b) Yearly plan (FY2007)
   (c) Plans for operation after termination of the project
   (d) Validity of expense estimates

3. Focus points for selection

(1) Proposal Sheet 2: Current status of and plans for creation of institutional repository
   (a) Structures and systems for implementation, system outline, content, system management and operation regime
      - Are structures for implementation comprehensive?
      - When the project involves collaboration with other universities, is there a clear division of responsibilities between the universities?
      - Are plans for system configuration and linkage with other internal and external systems substantial?
      - Is the proportion of metadata-only content low?

- To what extent are actual content items being made publicly available?
- Is there a clear division of responsibilities between university faculty/staff, outsourcers and other parties involved in system management and operation?

(2) Proposal Sheet 3: Conceptualization and viability of the proposal, operation plan, etc.

(a) Project aims
- Does the plan establish clear objectives for the project?
- Does the plan envisage clear outcomes for the project?

(b) Yearly plan (FY2007)
- Has a clear implementation plan been established?
- Are there valid correlations between the content of the project to be implemented and the proposed project expenses (including funds raised by the applicant)?
- Is there a clear division of roles in cases of collaboration with other institutions?

(c) Plans for operation after termination of the project
- Are plans for operation after termination of the project secure and sustainable?
- In particular, are there clear prospects for maintaining funding and personnel?

(d) Validity of expense estimates
- Are the expense estimates supplied valid, and is it envisaged that funding will be used effectively?

6. Calendar of Events

6.1 FY2005

	Date	Event	Venue
1	Wednesday June 22, 2005	Workshop on institutional repositories and metadata	National Institute of Informatics
2	Tuesday February 15, 2006	Workshop for personnel in charge of institutional repository operations	National Institute of Informatics
3	Monday March 6, 2006	FY2005 Institutional Repository Working Committee meeting 1	National Institute of Informatics
4	Wednesday March 29, 2006	FY2005 Institutional Repository Working Committee meeting 2	National Institute of Informatics

6.2 FY2006

	Date	Event	Venue
1	Tuesday April 19, 2006	Information session for FY2006 CSI-commissioned project applications	National Center of Sciences
2	Monday May 15, 2006	FY2006 Institutional Repository Working Committee meeting 1	National Institute of Informatics
3	Tuesday May 16, 2006	FY2005 CSI-commissioned projects debriefing and discussion meeting	National Center of Sciences
4	Friday June 23, 2006	FY2006 Institutional Repository Working Committee meeting 2	National Institute of Informatics
5	Wednesday July 12, 2006	FY2006 CSI-commissioned projects information session	National Center of Sciences
6	Thursday July 21, 2006	Information session on systems for creation of institutional repositories	National Institute of Informatics
7	Wednesday July 26 to Friday July 28, 2006	FY2006 Academic Portal Training Course	Nagoya University
8	Thursday August 3, 2006	FY2006 Institutional Repository Working Committee meeting 3	National Institute of Informatics
9	Wednesday August 30 to Friday September 1, 2006	FY2006 Academic Portal Training Course	National Institute of Informatics
10	Tuesday September 26, 2006	FY2006 Institutional Repository Working Committee meeting 4	National Institute of Informatics
11	Monday December 11, 2006	FY2006 Institutional Repository Working Committee meeting 5	National Institute of Informatics
12	Monday December 18 to Tuesday December 19, 2006	"Standing on the Shoulders of Digital Giants" International Symposium on Institutional Repositories, e-Science and the Future of Academic Communication	Toshi Center Hotel (Chiyoda-ku, Tokyo)
13	Thursday March 15, 2007	FY2006 Institutional Repository Working Committee meeting 6	National Institute of Informatics

6.3 FY2007

	Date	Event	Venue
	Tuesday May 22, 2007	FY2007 Institutional Repository Working Committee meeting 1	National Institute of Informatics
	Friday 8 June, 2007	National Institute of Informatics Open House 2007 CSI Workshop: “First step of Institutional Repositories”	National Center of Sciences
	Monday July 2, 2007	FY2007 Library Liaison Working Committee meeting 1	National Institute of Informatics
	Monday July 2, 2007	FY2007 Library Liaison Working Committee IRWG meeting 1	National Institute of Informatics
	Tuesday July 3, 2007	FY2006 CSI-commissioned projects debriefing and discussion meeting	Bellesalle Kudan (Chiyoda-ku , Tokyo)
	Wednesday July 11 to Friday July 13, 2007	FY2007 Academic Portal Training Course	Nagoya University
	Wednesday August 22 to Friday August 24, 2007	FY2007 Academic Portal Training Course	National Institute of Informatics
	Friday September 7, 2007	FY2007 Library Liaison Working Committee IRWG meeting 2	National Institute of Informatics
	Wednesday September 12, 2007	NII Library Forum 2007	National Center of Sciences
	Friday September 14, 2007	NII Library Forum 2007	Kyushu University
	Thursday September 20, 2007	FY2007 Library Liaison Working Committee IRWG meeting 3	National Institute of Informatics
	Tuesday September 25, 2007	NII Library Forum 2007	Campus Plaza Kyoto
	Thursday September 27, 2007	NII Library Forum 2007	Hokkaido University
	Wednesday October 3, 2007	NII Library Forum 2007	Nagoya University
	Friday October 5, 2007	NII Library Forum 2007	Okayama University
	Monday October 15, 2007	FY2007 Library Liaison Working Committee meeting 2	National Institute of Informatics
	Thursday January 17, 2008	FY2007 Library Liaison Working Committee meeting 3	National Institute of Informatics
	Tuesday February 26, 2008	FY2007 Library Liaison Working Committee meeting 4	National Institute of Informatics

List of contributors (by name, affiliation as of December 2008)

Name	Affiliation	Section
Hiroshi Itsumura	Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	I-1~3
Norihiko Uda	Associate Professor, Graduate School of Library, Information and Media Studies, University of Tsukuba	IV-2～4,6
Hideki Uchijima	Manager, Information Planning Division, Information Department, Kanazawa University	III
Satoru Kinoshita	Manager, Information Management Division, Kyoto University Library	II
Yoshinori Sato	Professor, Faculty of Letters, Tohoku Gakuin University	Topics 1
Hiroya Takeuchi	Associate Professor, Faculty of Letters, Chiba University	Topics2
Takao Namiki	Associate Professor, Department of Mathematics, Graduate School of Science, Hokkaido University	IV-5, Topics 2
Shinji Mine	Assistant Professor, Library Studies, Nagoya University	I-4, IV-1

Published in December, 2008

Published by: Inter-University Research Institute Corporation
Research Organization of Information and Systems
National Institute of Informatics
2-1-2 Hitotsubashi, Chiyoda-ku, Tokyo 101-8430
TEL +81-3-4212-2350
FAX +81-3-4212-2375
E-mail ir@nii.ac.jp

ISBN : 978-4-86049-047-8