

Trends of the Institutional Repositories on Agricultural Universities in Japan

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Abstract

The development of institutional repositories allows universities to apply systematic leverage to accelerate changes taking place in scholarship and scholarly communication. The present status of institutional repositories in agricultural universities was surveyed in January 2010. There are over seventy of agricultural universities which include the broad area related agriculture such as the faculty and graduate school of Agriculture, Veterinary Medicine, Life Science, Fisheries Sciences, Agricultural Resource Sciences, Horticulture, Marine Science and Technology, Textile Science and Technology, Environmental Studies in Japan. The experimental project of institutional repositories was started in 2004 in Japan. Since then, over 100 universities have joined the National Institute of Informatics Institutional Repositories Program. The contents of institutional repositories consist of journal article, dissertation, bulletin, meeting article, document for meetings, book, technical report, magazine article, preprint, learning material, data/dataset, software and other material. The number and type of contents of institutional repositories differ between each agricultural university. The contents of institutional repositories at each agricultural university should expand qualitatively and quantitatively. It is hoped that the number and quality of general learning materials will also increase in the future. The future direction of institutional repositories of agricultural universities in Japan is also discussed.

Introduction

Institutional repositories provide universities with a sound method/way of significantly improving scholarship and scholarly communication. More and more, a university-based institutional repository provides a service to universities in Japan for the management and dissemination of digital materials created by the institution and its community members. While operational responsibility for these services may reasonably be situated in different organizational units at different universities, an effective institutional repository, of necessity, represents a collaboration among librarians, information technologists, archives and materials managers, faculty, and university administrators and policymakers [Clifford A.L., 2003]. An institutional repository differs from other digital collections that might be offered by a university library such as access to e-book or e-journal etc. In the case of an institutional repository, content is deposited in a repository by the creator or owner, so it is necessary that repository architecture manages the content and the metadata, and repository software offers a minimum set of basic services to input or retrieve the content. The repository must be sustainable, trusted, well supported and well-managed [Tedd, L. A. 2009]. At any given point in time, an institutional repository will be supported by a set of IT tools. A key part of the services that comprise an institutional repository is the management of technological changes, in particular the migration of digital content from one set of IT tools to the next as part of the organizational commitment to providing repository services. It can be said that an institutional repository is not simply a fixed set of software and hardware [Clifford A.L., 2003]. For a scientist who works to give the widest possible dissemination, and to gain as much recognition for it as possible, open access is the way to go. The visibility comes from having open access vehicles indexed by Google, Google Scholar and other web search engines. The recognition and impact

come from the fact that these search engines lead us directly being able to access the scientist's full-text articles on the readers' desktops. There are two main ways to make open access work. One is to publish articles in open access journals and the other is to deposit articles in open access research repositories [Swan A., 2009]. The development of institutional collections of published outputs which are made openly available over the Web is an important role of the university-based institutional repository. From the perspective of the institutions, the research institutional repository might have two functions. One is an administration tool for the institutions in relation to annual reports, research assessment exercises, etc, and the other is a way of showcasing the research output of the institutions. Clearly, the present state of research institutional repositories is not yet in the final phase of innovation implementation called 'infusion', whereby the scholarly communication system as a whole will function at a higher level. However, working on three tracks to improve the functionality of the repositories for authors, institutions and users will make this final stage of innovation adoption achievable [Vernooy-Gerritsen, M. et al, 2009]

The experimental project of institutional repositories was started on 2004 in Japan [Murakami Y. and Adachi J. 2006]. To amplify the current content services and develop the next generation of scholarly content infrastructure, NII helps universities in Japan to introduce and operate institutional repositories [NII Phase 1 Report. 2008]. Since an institutional repository started in 2004 in Japan, over 100 universities have joined the National Institute of Informatics Institutional Repositories Program [NII Institutional Repositories Program. <http://www.nii.ac.jp/irp/en/about/>]. There are over seventy agricultural faculties and universities in Japan, which investigate the broad area related to agricultural studies, such as the faculties and/or graduate schools of Agriculture, Veterinary Medicine, Life Science, Fisheries Sciences, Agricultural Resource Sciences, Horticulture, Marine Science and Technology, Textile Science and Technology, Environmental Studies. The contents of institutional repositories consist of journal article, dissertation, bulletin, meeting article, document for the meeting, book, technical report, magazine article, preprint, learning material, data/dataset, software and other material.

In this paper investigations are carried out to evaluate the present status of institutional repositories on agricultural faculties and universities in Japan. Our study highlights five main factors influencing the status of institutional repositories; the type of universities, the type of materials, the number of material titles, the number of materials and the size of universities. It is studied how the number and type of contents among institutional repositories on agricultural faculties and universities are different or varied.

Method

The authors chose the site of the National Institute of Informatics (NII) Institutional Repositories Program (<http://www.nii.ac.jp/irp/en/about/>) to obtain a list of institutional repositories which also includes universities in Japan. The authors accessed each university site based on the list of institutional repositories by NII and then downloaded the metadata of repositories archived in the institutional repository in each university during January 2010. The datasets which are the type of universities, the type of materials, the number of material titles, the number of materials and the size of universities were taken out from institutional repositories on agricultural faculties and universities in Japan. When the user visits an institutional repository at first, most all of institutional repositories request the user registration to use their service for downloading full-text articles or original documents. The authors registered the password in each site of institutional repositories and then accessed their service for downloading full-text articles or original documents, if needed, to verify the type of materials. When a user accesses sites of institutional repositories at first, many of the sites request the registration of user name and password. We had the registration at first and then accessed at each site of institutional repositories for getting the data.

Data Analysis and Results

Institutional repositories at universities in Japan

The number and percentage of institutional repositories at universities in Japan are shown in Table 1. The total number of universities is 773, based on the data of school basic survey 2009 by the Ministry of Education, Culture, Sports, Science and Technology in Japan. The number and percentage of institutional repositories at universities were 104 and 13.5, respectively. The number of faculties and universities in agricultural fields, calculated from the data of school basic survey 2009, was 77. Among the total number of universities, the percentage of faculties and universities in agricultural fields was 10.0. The number of institutional repositories at faculties and universities in agricultural fields was 39. The percentage of faculties and universities in agricultural fields which established an institutional repository since 2004 was 50.6. It is significant that more than half of the universities in agricultural fields have established their institutional repositories in the last six years.

Table 1. Number of institutional repositories at universities in Japan

	Number	%
Institutional Repositories of B	39	5.0
Agricultural Faculties and Universities (B)	77	10.0
Institutional Repositories of A	104	13.5
All Universities (A)	773	100.0

The number and percentage of institutional repositories at three different types of university in Japan are shown in Table 2. There are three different types of university in Japan: National University Corporation, Prefectural and Municipal University, and Private University. The number and percentage of institutional repositories among the three different types of university were 73(70.2%), 4(3.8%) and 27(26.0%), respectively. As we have indicated before, the institutional repositories in National University Corporations formed the largest part among them. The number and percentage of institutional repositories at faculties and universities in agricultural fields among the three different types of university were 37(94.9%), 1(2.6%) and 1(2.6%), respectively. The institutional repositories of agricultural fields in National University Corporations form the largest portion among all universities.

Table 2. Number of institutional repositories at the three different types of universities in Japan

	National University Corporation	%	Prefectural and Municipal University	%	Private University	%	Total	%
Institutional Repositories of B	37	94.9	1	2.6	1	2.6	39	100.0
Agricultural Faculties and Universities (B)	43	55.8	12	15.6	22	28.6	77	100.0
Institutional Repositories of A	73	70.2	4	3.8	27	26.0	104	100.0
All Universities (A)	86	11.1	92	11.9	595	77.0	773	100.0

Material titles and types of materials

The types of materials which are archived in institutional repositories consist of journal article, thesis or dissertation, departmental bulletin paper, conference paper, presentation, book, technical report, research paper, article, preprint, learning material, data or dataset, software, and other material. The number of material titles in each field of agricultural studies was surveyed to see whether the number and types of contents of institutional repositories in each agricultural university were different or varied (Table 3). The fields of agricultural study were divided into four broad groups; Agriculture, Veterinary science, Animal husbandry and Fisheries science. The percentage of material titles in Agriculture was the highest among the four broad groups. The number of material titles in Agriculture and the percentage of material titles of Agriculture in the total material titles were 208 and 69.8%, respectively. In Agriculture, the percentage of departmental bulletin paper among all the types of materials was the highest, that of “thesis or dissertation” was the second highest, and that of journal article was the third highest. The percentage of material titles in Fisheries science was the second highest among the four broad groups. The number of material titles in Fisheries science and the percentage of material titles of Fisheries science in the total material titles were 36 and 12.1%, respectively. In Fisheries science, the percentage of departmental bulletin paper among all the types of materials was the highest, that of journal article was the second highest, and that of thesis or dissertation was the third highest. The percentage of material titles in Animal husbandry was the third highest among the four broad groups. The number of material titles in Animal husbandry and the percentage of material titles of Animal husbandry in the total material titles were 28 and 9.4%, respectively. In Animal husbandry, the percentages both of technical report and journal article among all the types of materials were the one of the highest, that of departmental bulletin paper was the third highest. The percentage of material titles in Veterinary science was the fourth highest among the four broad groups. The number of material titles in Veterinary science and the percentage of material titles of Veterinary science in the total material titles were 26 and 8.7%, respectively. In Veterinary science, the percentage of journal article among all the types of materials was the highest, that of technical report was the second highest, percentages of departmental bulletin paper and “thesis or dissertation” were the third highest. As described above, the number and types of material titles are different among the four broad groups of agricultural studies which are archived in institutional repositories of agricultural faculties and universities (Table 3).

Table 3. Number of material titles in each field of agricultural studies in Japan

Types of materials	Agriculture		Veterinary science		Animal husbandry		Fisheries science		Total	
	Number of material titles	%								
Journal Article	25	12.0	9	34.6	9	32.1	6	16.7	49	16.4
Thesis or Dissertation	33	15.9	5	19.2	2	7.1	5	13.9	45	15.1
Departmental Bulletin Paper	95	45.7	5	19.2	5	17.9	15	41.7	120	40.3
Conference Paper	17	8.2			1	3.6	4	11.1	22	7.4
Presentation										
Book	4	1.9							4	1.3
Technical Report	17	8.2	7	26.9	9	32.1	1	2.8	34	11.4
Research Paper	2	1.0							2	0.7
Article					1	3.6			1	0.3
Preprint										
Learning Material	6	2.9					2	5.6	8	2.7
Data or Dataset	2	1.0			1	3.6			3	1.0
Software										
Others	7	3.4					3	8.3	10	3.4
Total	208	100.0	26	100.0	28	100.0	36	100.0	298	100.0

The types of materials which are archived in institutional repositories were surveyed at the sites in all universities and also ones in agricultural faculties and universities in Japan (Table 4). The number of materials in all universities is derived from the data at the site of NII Institutional Repositories Program on January 2010. The number of materials in agricultural faculties and universities is obtained by accessing each site of the institutional repositories at the faculties and universities in agricultural studies on January 2010 directly. The authors registered the password at each site of the institutional

repositories and then accessed their service for downloading full-text articles or original documents. The total number of materials was 798,115 among all universities and 31,507 among agricultural faculties and universities, respectively. The percentage of materials in agricultural faculties and universities was 3.9%. As we have indicated before, the number of materials in agricultural faculties and universities is only a small proportion of that for all universities. In all universities, the percentage of departmental bulletin paper among all the types of materials was the highest, that of journal article was the second highest, and that of others was the third highest. On the other hand, in agricultural faculties and universities, the percentage of departmental bulletin paper among all the types of materials was the highest, that of journal article was the second highest, and that of conference paper was the third highest. Although the fact remains that the percentage of departmental bulletin paper was the highest in both cases, the percentage of the one in agricultural faculties and universities was very high over-sixty percent.

Table 4. The types of materials are archived in institutional repositories in Japan

Types of materials	All Universities		Agricultural Faculties and Universities	
	Number of materials	%	Number of materials	%
Journal Article	199,603	25.0	3,505	11.1
Thesis or Dissertation	43,309	5.4	3,036	9.6
Departmental Bulletin Paper	343,542	43.0	20,858	66.2
Conference Paper	52,796	6.6	2,401	7.6
Presentation	2,206	0.3		
Book	16,526	2.1	23	0.1
Technical Report	4,181	0.5	1,336	4.2
Research Paper	13,205	1.7		
Article	26,993	3.4	106	0.3
Preprint	294	0.0		
Learning Material	4,138	0.5	112	0.4
Data or Dataset	607	0.1	125	0.4
Software	8	0.0		
Others	90,707	11.4	5	0.0
Total	798,115	100.0	31,507	100.0

Materials in each field of agricultural studies

The number of materials in each field of agricultural studies was surveyed to see whether the number and types of materials on institutional repositories in each agricultural university are different or varied (Table 5). The fields of agricultural studies were divided into four broad groups; Agriculture, Veterinary sciences, Animal husbandry and Fisheries science. The percentage of materials in Agriculture was the highest among the four broad groups. The number of materials in Agriculture and the percentage of materials of Agriculture in the total materials were 23,586 and 74.9%, respectively. In Agriculture, the percentage of departmental bulletin paper among all the types of materials was the highest, that of conference paper was the second highest, and that of “thesis or dissertation” was the third highest. The percentage of materials in Fisheries science is the second highest among the four broad groups. The number of materials in Fisheries science and the percentage of materials of Fisheries science in the total materials were 3,402 and 10.8%, respectively. In Fisheries science, the percentage of departmental bulletin paper among all the types of materials was the highest, that of journal articles was the second

highest, and that of “thesis or dissertation” was the third highest. The percentage of materials in Veterinary sciences was the third highest among the four broad groups. The number of materials in Veterinary science and the percentage of materials of Veterinary science in the total materials were 2,878 and 9.1%, respectively. In Veterinary science, the percentages of departmental bulletin paper among all the types of materials were the highest, that of journal article was the second highest and that of “thesis or dissertation” was the third highest. The percentage of materials in Animal husbandry was the fourth highest among the four broad groups. The number of materials in Animal husbandry and the percentage of materials by the total materials were 1,641 and 5.2%, respectively. In Animal husbandry, the percentage of departmental bulletin paper among all the types of materials was the highest, that of technical report was the second highest and that of journal articles was the third highest. As described above, the number and types of materials which are archived in institutional repositories at the agricultural faculties and universities are different among the four broad groups in agricultural studies (Table 5).

Table 5. Number of materials in each field of agricultural studies in Japan

Types of materials	Agriculture		Veterinary science		Animal husbandry		Fisheries science		Total	
	No of materials	%	No of materials	%	No of materials	%	No of materials	%	No of materials	%
Journal Article	2,285	9.7	397	13.8	213	13.0	610	17.9	3,505	11.1
Thesis or Dissertation	2,349	10.0	384	13.3	69	4.2	234	6.9	3,036	9.6
Departmental Bulletin Paper	15,512	65.8	2,037	70.8	775	47.2	2,534	74.5	20,858	66.2
Conference Paper	2,398	10.2					3	0.1	2,401	7.6
Presentation										
Book	23	0.1							23	0.1
Technical Report	798	3.4	60	2.1	478	29.1			1,336	4.2
Research Paper										
Article					106	6.5			106	0.3
Preprint										
Learning Material	91	0.4					21	0.6	112	0.4
Data or Dataset	125	0.5							125	0.4
Software										
Others	5	0.0							5	0.0
Total	23,586	100.0	2,878	100.0	1,641	100.0	3,402	100.0	31,507	100.0

Six main national universities and other universities in agricultural studies

The number and types of materials which are archived in institutional repositories in both six main national universities and other universities in agricultural studies in Japan are shown in Table 6. The number of materials in six main national universities was 15,467 and the percentage of materials by the total number of materials was 48.4, respectively. The number of materials in the other universities was 16,504 and the percentage of materials by the total number of materials was 51.6, respectively. The number of materials in six main national universities is in a same proportion of the one in the other 28 universities. In six main national universities, the percentage of departmental bulletin paper among all the types of materials was the highest, that of conference paper was the second highest, and that of journal article was the third highest. On the other hand, in the other 28 universities, the percentage of departmental bulletin paper among all the types of materials was the highest, that of “thesis or dissertation” was the second highest, and that of journal article was the third highest. Although the fact remains that the percentage of departmental bulletin paper was the highest in both cases, the percentage of departmental bulletin paper in six main national universities was very high nearly-eighty percent. The fact shows the coverage of contents at the institutional repositories in six main national universities is very limited in scope. As shown in the percentage of “thesis or dissertation” and journal article of the other 28 universities, it is clear that the variation of types of materials was relatively larger than that of six main national universities. It is absolutely essential to expand the coverage of contents at the institutional repositories in a future for supporting the activities of academic research in the universities.

Table 6. Number of materials in six main national universities and the other universities

Types of materials	Six main national universities		The other universities	
	Number of materials	%	Number of materials	%
Journal Article	860	5.6	2,645	16.0
Thesis or Dissertation	349	2.3	2,687	16.3
Departmental Bulletin Paper	12,273	79.3	8,585	52.0
Conference Paper	1,690	10.9	711	4.3
Presentation				
Book			23	0.1
Technical Report	223	1.4	1,145	6.9
Research Paper				
Article			106	0.6
Preprint				
Learning Material	70	0.5	42	0.3
Data or Dataset			125	0.8
Software				
Others	2	0.0	435	2.6
Total	15,467	100.0	16,504	100.0

Conclusion

It is clear that the institutional repository is a very powerful tool that can serve as an engine of change for our institutions of higher education, and more broadly for the scholarly enterprises that they support. If properly developed, it advances a surprising number of goals, and addresses an impressive range of needs. This is an area where universities need to invest aggressively, but where they also need to proceed thoughtfully and carefully, with broad consultation and collaboration across the campus community and with a full understanding that if they succeed they will permanently change the landscape of scholarly communication [Clifford A.L., 2003]. It is thought that every higher education institution will need or want to run an institutional repository in a future. The institutional repository of universities in Japan is now moving in the direction of the realization of this hope. The contents of institutional repositories consist of journal article, dissertation, bulletin, meeting article, document for the meeting, book, technical report, magazine article, preprint, teaching material, data/dataset, software and others. The number and types of contents at institutional repositories in each agricultural university were different and varied. It is necessary to add the contents at institutional repositories in each agricultural university in Japan in order to improve retrieval functions of academic information in the age to come. The number of learning materials at institutional repositories is rather small in Japan. The coverage of contents at institutional repositories should expand to learning materials for using the inside and outside of classrooms in a future.

The institutional repositories of agricultural fields in National University Corporations form the largest portion of the ones in all universities. The institutional repositories at Prefectural and Municipal Universities, and Private Universities should expand the content qualitatively and quantitatively in a future. The fields of agricultural studies were divided into four broad groups; Agriculture, Veterinary science, Animal husbandry and Fisheries science. It is clear that the number and types of material titles are different among the four broad groups of agricultural studies which were archived in institutional repositories of agricultural faculties and universities. It could be to say the contents archived in institutional repositories rely heavily on the study fields in agriculture. Although the fact remains that

the percentage of departmental bulletin paper was the highest in both cases of all universities and of agricultural faculties and universities in Japan, the percentage of that in agricultural faculties and universities was very high over-sixty percent compared with that of all universities nearly-forty percent. The coverage of institutional repositories at the agricultural fields could say to be very limited compared with that at the entire area of research fields in universities in Japan. The number and types of materials archived in institutional repositories at the agricultural faculties and universities are different among the four broad groups in agricultural studies. It could be also to say the contents archived in institutional repositories rely heavily on research fields in agriculture. Although the fact remains that the percentage of departmental bulletin paper was the highest in both cases in six main national universities and the other universities in agricultural studies in Japan, the percentage of that in six main national universities was very high nearly-eighty percent. It is very obvious that the institutional repositories at the agricultural research fields have large possibilities to introduce the various types of material titles and/or materials to the constituent members of university in a future.

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