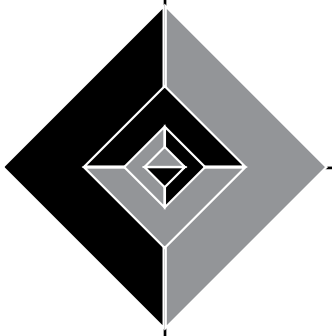

SPEC Kit 338

Library Management of Disciplinary Repositories

November 2013

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SURVEY RESULTS

REPRESENTATIVE DOCUMENTS

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SURVEY RESULTS

EXECUTIVE SUMMARY

Introduction

Disciplinary repositories are open access, host scholarly materials,[1] accept deposits from national or international contributors, and are disciplinary, multidisciplinary, or interdisciplinary resources. They are a significant component of the scholarly communication environment, and can be highly visible and important mechanisms for sharing disciplinary research to dedicated communities. This survey was developed to gain a better understanding of the ways in which research libraries are involved in the administration of disciplinary repositories. It was distributed to the 125 ARL member libraries in July 2013 and these results are based on data submitted by 49 libraries (39%) by the deadline of September 3, 2013.

Thirteen respondents reported that their institution hosts or manages a disciplinary repository. The survey identified 34 disciplinary repositories managed by ARL institutions, both with and without library involvement. For the purposes of this study, the 12 repositories that are managed entirely or in part by the library are analyzed.[2] The 12 repositories are based at seven ARL institutions, which comprise 6% of ARL membership, demonstrating that disciplinary repository management is not widespread among ARL membership. While most respondents reported management of a single repository, two institutions manage many repositories. The University of Pittsburgh Libraries manage six disciplinary repositories in partnership with other campus departments or other institutions. At Purdue University, the Libraries manage one disciplinary repository, and other campus departments manage 16 disciplinary repositories.

The development and management of disciplinary repositories seem to be unique to local circumstances, and disciplinary repositories are certainly not as common as institutional repositories. Institutional repositories are nearly always based in an institution's library, but disciplinary repositories have several models of management, only some of which involve a library. Some disciplinary repositories are managed solely by the library. Others use a library partnership with a parent institution department, a library partnership with a non-parent institution, a department as sole manager, multiple departmental partnerships, or multiple institution partnerships. Diverse management models may be a contributing factor to the lack of information published about disciplinary repository management (Adamick and Reznik-Zellen 2010).

Library management of disciplinary repositories supports one of ARL's basic principles that "Research libraries are active agents central to the process of the transmission and creation of knowledge" (Association of Research Libraries). A repository itself can help to document and define an area of study by collecting disparate research and making it discoverable in one place. The library can bring significant added value to a disciplinary repository, for example, through the development of a controlled vocabulary. Eight of the twelve repositories have developed a controlled vocabulary, which can help to define and document disciplinary terminology. Preservation is another value that libraries add to disciplinary repositories, although in most cases it was not a reported driving factor for repository development.

Like institutional repositories, disciplinary repositories require substantial staff mediation, quality control, and outreach efforts to build and maintain their specialized collections. Low contribution rates reported by a few of the respondents indicate that

the disconnect between curation activities and the research cycle (Pryor 2012) presents a barrier even for publication-oriented disciplinary repositories. The obvious exception to this is PubMed Central®, which alone has the benefit of federal legislation for content deposit. Dedicated services for knowledge generation facilitate the success of subject repositories (Armbruster and Romary 2009), and many repositories in this survey provide social networking and community building tools as well as content to their communities.

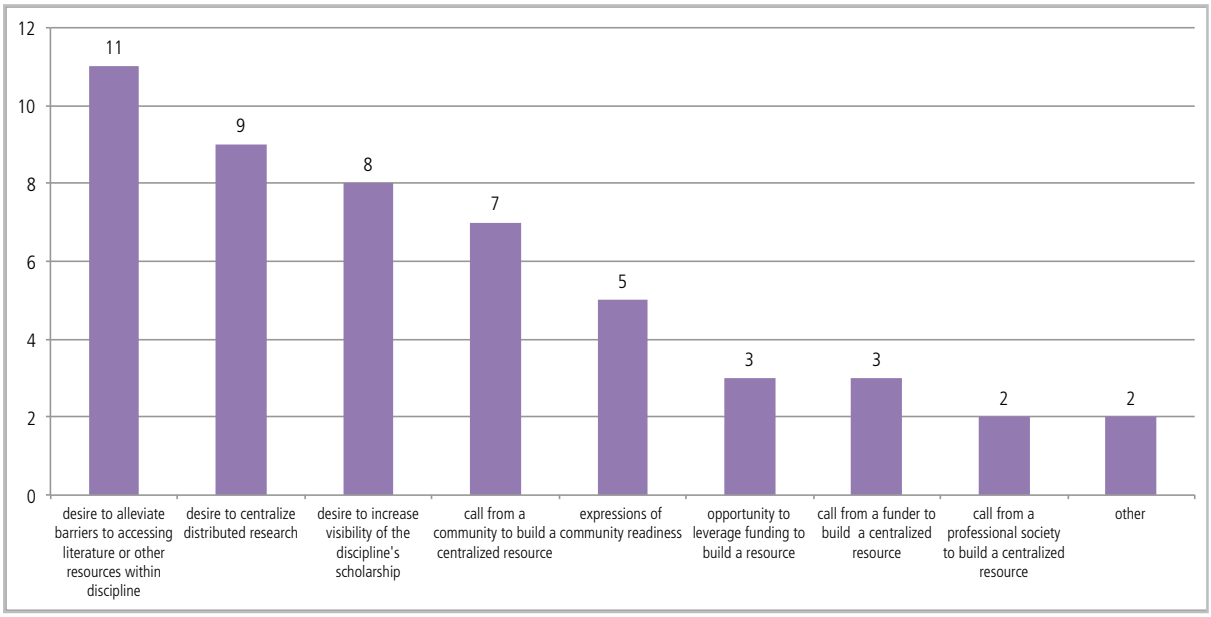
Disciplinary repositories are also similar to institutional repositories in that they both require a significant financial investment to operate. A variety of funding mechanisms, including external grant funding, internal library budgets, one-time supplements, endowments, and membership fees are employed alone or in combination to support these initiatives. Many repositories included in this study use unique funding models, but more than half of the reporting libraries support their disciplinary repositories through their own budgets. This support may contribute to a sense of confidence in repository sustainability.

There were few meaningful trends identified in the survey responses, and the low number of library-managed repositories identified are best presented in a case study report format. Because of their explicit focus on specialized communities and diverse management models, the lack of identifiable trends seems appropriate. Although disciplinary communities have a common dedication to broadening access to their research outputs, they assemble a variety of administrative models, collection development strategies, and outreach mechanisms to accomplish their goals.

Origins, Subjects, and Communities

While there are many reasons that a community would undertake the effort of developing a disciplinary repository, the primary reason reported is a desire to alleviate the barriers of accessing the literature and other resources within the discipline (see Figure 1). Centralizing resources and increasing their visibility support this inclination to remove barriers to access. The Aphasiology Archive, for example, explicitly noted the need to create a central location for the products of an annual disciplinary conference. A call from the disciplinary community itself was frequently reported, as was some evidence of community readiness that a disciplinary resource was needed. In some cases, the opportunity to leverage a funding source, or

Figure 1: Motivating Factors for the Development of a Disciplinary Repository



an explicit call from a funder were motivating factors. As an extension of this concept, InterNano noted that its development was part of "broader impacts" activities for a large research center, making it an important component of an overarching research project. Only one repository, Dryad, cited the need for preservation and archiving policies. PubMed Central, because of its unique status as the mandated repository for the National Institutes of Health (NIH), was developed out of a need to share the publicly funded products of the NIH research community. As noted by the respondent, "This initially voluntary activity was later mandated by Congress in 2008 through a requirement of National Institutes of Health researchers to submit final, peer-reviewed manuscripts to PubMed Central."

Of the 12 disciplinary repositories represented, the earliest was established in 1995 and the most recent was launched in 2013. Between 2000 and 2013, a repository was established almost annually, with the exception of 2005, 2006, and 2011 (see Table 1). However, none of the ARL libraries that responded to the survey reported active or future planning to launch a disciplinary repository.

As expected, disciplinary repositories are more common in the sciences, with only three social science repositories and two humanities repositories among those represented in this study. This may be due to the continued high rate of publication in the sciences, as well as the increase in scientific grey literature (Larsen and von Ins 2010).

The primary audience for disciplinary repositories is the academic communities that they serve. Government, non-profit workers, and industry professionals are other common audience segments, which is unsurprising given the subject matter of many of the repositories in this study. Students and the general public are less commonly reported as target audiences, although The Digital Archaeological Record (tDAR) noted, "The repository contents [are] not explicitly designed to be of interest to the general public, however, many of the visitors to the repository website appear to be members of the general public who have an interest in the archaeology of specific geographical areas or topics. We are pleased that the repository also is of interest to this audience and may in the future develop features that are of interest and relevance to such visitors and users." This is an unintended positive consequence of providing open access to disciplinary scholarly resources. Dryad uniquely includes publishers, learned societies, research institutions, and funding bodies as part of their primary audience. Dryad's content focus on research data and their content recruitment model of partnering with publishers may contribute to extended audiences.

Table 1. Repository Launch Date and Subject Coverage

Repository	Launch Date	Subject Coverage
AgEcon Search	1995	Agriculture and applied economics
PubMed Central®	2000	Biomedicine
HABRI Central	2012	Human-animal interaction
Industry Studies Working Papers	2010	Industry studies
InterNano	2007	Nanomanufacturing
The Aphasiology Archive	2003	Communication impairments and disorders
Dryad	2008	Evolutionary biology and ecology
PhilSci-Archive	2001	Philosophy of science
Resources in Integrated Care for Morbidity Management and Disability Prevention (RIIC-4MMDP)	2013	Neglected tropical diseases, disability prevention, early detection of disease and prevention
Archive of European Integration	2002	European integration
The Digital Archaeological Record (tDAR)	2009	Archaeology and related fields
Minority Health and Health Equity Archive	2004	Minority health, health disparities, ethnic and racial disparities in health research, policy, and services

Most repositories did not have a sense of audience size. Only four repositories were able to identify audience size, based on the size of the disciplinary research community, industry market, or government stakeholders. For InterNano, specifically, the range of audience types and sectors presented a barrier to gauging the size of the audience accurately. These responses indicate a need to develop a tool to gauge audience size for assessment purposes.

There are several reported preparatory activities performed prior to launching a disciplinary repository. The most common activity is the formation of an advisory board. Researching repository features, repository software, and the disciplinary environment, and creating a strategic plan for the repository are also common activities that inform repository development. HABRI Central solicited market and sustainability plans from consultants and literature reviews. Less common development activities are those that directly or indirectly solicit stakeholder feedback, such as workshops or charrettes, focus groups, or user or author surveys. Expense, time, and specialized skills required to successfully undertake these information-gathering and planning activities are considerations for disciplinary repository managers.

Features and Content

When asked about the software platform that the repositories are built upon, more than half of the respondents report using the United Kingdom-based EPrints[3] software. DSpace[4] is used by AgEcon Search and Dryad; HubZero[5] is used by HABRI Central; custom software platforms have been implemented by PubMed Central and tDAR. Dryad also incorporates custom software with their DSpace installation.

Apart from the research content that is provided by these repositories, respondents were asked about the other tools and resources that they offer to provide disciplinary context and develop community. Social networking and sharing tools are the most common, with reported ties to Twitter, Facebook, email discussion lists, RSS feeds, blogs, and LinkedIn. More labor-intensive electronic newsletters and calendars are also provided. InterNano provides a directory, original content, and a disciplinary technical process database to its users; HABRI Central offers simulation tools and statistical packages, as well as a discussion forum. PubMed Central is unique in that it is integrated with an established suite of bibliographic and database tools provided by the National Center for Biotechnology Information.[6]

All of the repositories promote use to their communities, mostly through conference presentations, email announcements, and newsletters. None of the repositories have a "build it and they will come" model, they instead use active marketing practices and make arrangements with organizations to build their collections. Repositories perform a number of content recruitment methods, and all of the repositories reported formal arrangements with publishers, professional organizations, research centers, or funding bodies to recruit content. Most of the repositories have a policy that anyone can create an account and submit materials, and a practice that the repository staff create content. Nearly all respondents reported that repository staff monitor submissions to ensure they are within a repository's scope.

When asked if the recent government mandates have impacted their repository's collection development, most respondents did not perceive a change, but others were positive or aware of the impact of government mandates. For example, PubMed Central responded that a "Congressional mandate requires NIH funded manuscripts to be deposited, which has enriched the PubMed Central database and increased its usage," and tDAR responded, "In both positive and negative ways recent government actions, including mandates, have affected tDAR's content development. On the negative side, the budget cuts required by federal government sequestration have slowed the rate at which federal agency offices have decided to use tDAR to manage the archaeological information for which they are responsible. On the positive side, the Administration's developing policy of "Open Gov" and improving access to federal scientific data, including archaeological data, has created an interest in considering by federal agency offices in using tDAR to provide for this required access."

Respondents reported a wide range of accepted content types. The most commonly accepted content is working papers, and about half of the respondents accept pre-prints, post-prints, book chapters,

books, datasets, slides, video, dissertations, theses, and reports.

The repositories described in the survey are very diverse in size, ranging from 38 digital objects in Resources in Integrated Care for Morbidity Management and Disability Prevention (RIIC-4MMDP), which is under development, to 2.8 million digital objects in PubMed Central, which is one of the largest disciplinary repositories in existence (see Table 2). When reporting the entire collection size (total records), two repositories have collections under 1,000 records, three repositories have collections between 1,000 and 10,000 records, and four repositories have collections between 10,000 and 100,000 records. AgEcon Search and Industry Studies host only full text items. All but three repositories reported that they have records that link to external resources, and a significant portion of the collections in the tDAR and HABRI Central repositories are links to external resources. The definition of collection size varies with each repository, based on the focus on digital objects or metadata records.

Table 2. Number of Digital Objects and Metadata Records in Each Repository

Repository	Digital Objects	Metadata Records	Percent of Collection is Full Text
AgEcon Search	66,000	66,000	100%
PubMed Central®	2.8 million	over 2.8 million	-
HABRI Central	400	17,000	2%
Industry Studies Working Papers	130	130	100%
InterNano	1,003	1,859	54%
The Aphasiology Archive	1,450	1,734	84%
Dryad	3,823	11,077	35%
PhilSci-Archive	3,392	not reported	-
RIIC-4MMDP	38	not reported	-
Archive of European Integration	27,171	not reported	-
tDAR	24,163	390,000	6%
Minority Health and Health Equity Archive	1,000	2,550	39%

All of the case study repositories require that metadata records include, at a minimum, the elements title, creator, and date published. Only five require an identifier element; seven require a publisher element. Other metadata elements required by some of the repositories include: format, status, refereed, conference title, location, language, and funding/grant data, among others (see Table 3).

Table 3. Metadata Properties Required by Each Repository

Repository	Title	Creator	Identifier	Publisher	Date Published	Other Metadata Fields
AgEcon Search	x	x	x		x	
PubMed Central®	x	x		x	x	x
HABRI Central	x	x	x	x	x	
Industry Studies Working Papers	x	x			x	x
InterNano	x	x	x	x	x	x
The Aphasiology Archive	x	x		x	x	x
Dryad	x	x	x	x	x	x
PhilSci	x	x			x	
RIIC-4MMDP	x	x	x		x	x
Archive of European Integration	x	x			x	

Repository	Title	Creator	Identifier	Publisher	Date Published	Other Metadata Fields
tDAR	x	x		x	x	x
Minority Health and Health Equity Archive	x	x		x	x	

All of the case study repositories allow authors to submit descriptive metadata for repository content, and most of them rely on repository staff and student workers to submit descriptive metadata, and/or enhance or perform quality control of the records. Eight of the 12 repositories have developed a customized vocabulary, which can help to document a field and standardize terminology (see Table 4).

Table 4. Metadata Practices of Each Repository

Repository	Who Enters Metadata?	Metadata Records	Descriptive Tools	Standardized Vocabularies
AgEcon Search	Authors Student workers	66,000	Local or customized vocabularies, Uncontrolled vocabularies (i.e., user tags, author keywords)	
PubMed Central®	Authors	2.8 million	Standardized vocabularies (i.e., LCSH, MeSH, NanoParticle Ontology)	MeSH
HABRI Central	Authors Repository staff Student workers	17,000	Local or customized vocabularies	
Industry Studies Working Papers	Authors Repository staff	130	Uncontrolled vocabularies (i.e., user tags, author keywords)	
InterNano	Authors Repository staff Student workers	1,859	Local or customized vocabularies Uncontrolled vocabularies (i.e., user tags, author keywords)	
The Aphasiology Archive	Authors Repository staff Student workers	1,734	Uncontrolled vocabularies (i.e., user tags, author keywords)	
Dryad	Authors Repository staff Student workers	11,077	Standardized vocabularies Local or customized vocabularies Uncontrolled vocabularies	ITIS, HIVE, LCNAF, LCSH, MeSH, NBII, TGN, UBio
PhilSci-Archive	Authors Repository staff Student workers		Uncontrolled vocabularies (i.e., user tags, author keywords)	
RIIC-4MMDP	Authors Repository staff Student workers	38	Local or customized vocabularies	
Archive of European Integration	Authors Repository staff Student workers		Local or customized vocabularies Uncontrolled vocabularies (i.e., user tags, author keywords)	
tDAR	Authors Repository staff Student workers Third party	390,000	Local or customized vocabularies Uncontrolled vocabularies (i.e., user tags, author keywords)	

Repository	Who Enters Metadata?	Metadata Records	Descriptive Tools	Standardized Vocabularies
Minority Health and Health Equity Archive	Authors Repository staff Student workers	2,550	Local or customized vocabularies Uncontrolled vocabularies (i.e., user tags, author keywords)	

Administration and Staffing

Eight ARL libraries support a disciplinary repository in some way, and some support more than one (see Figure 2). The University of Pittsburgh Libraries, for example, support multiple disciplinary repositories under two different administration models. Most commonly, the library partners either with the parent institution or with another institution. It is much less common for repositories to be administered by the library independently; only PubMed Central and AgEcon Search are administered by the library alone.

Sustainability of funds for repositories and other digital resources is a theme in literature about digital libraries (Maron and Pickle 2013), but only one repository reported an unsustainable funding model. Confidence of sustainability is probably due to the fact that seven of the repositories reported parent institution or internal library regular budget funding. Two of the three remaining repositories with external grant funding had a second income stream, which may explain confidence in sustainability. Two repositories received funding from multiple external sources. Of the six repositories that reported the receipt of external grant funding, four received funding from federal sources, and of those, three received funding from the National Science Foundation (see Table 5).

Figure 2: Administration Models for Disciplinary Repositories

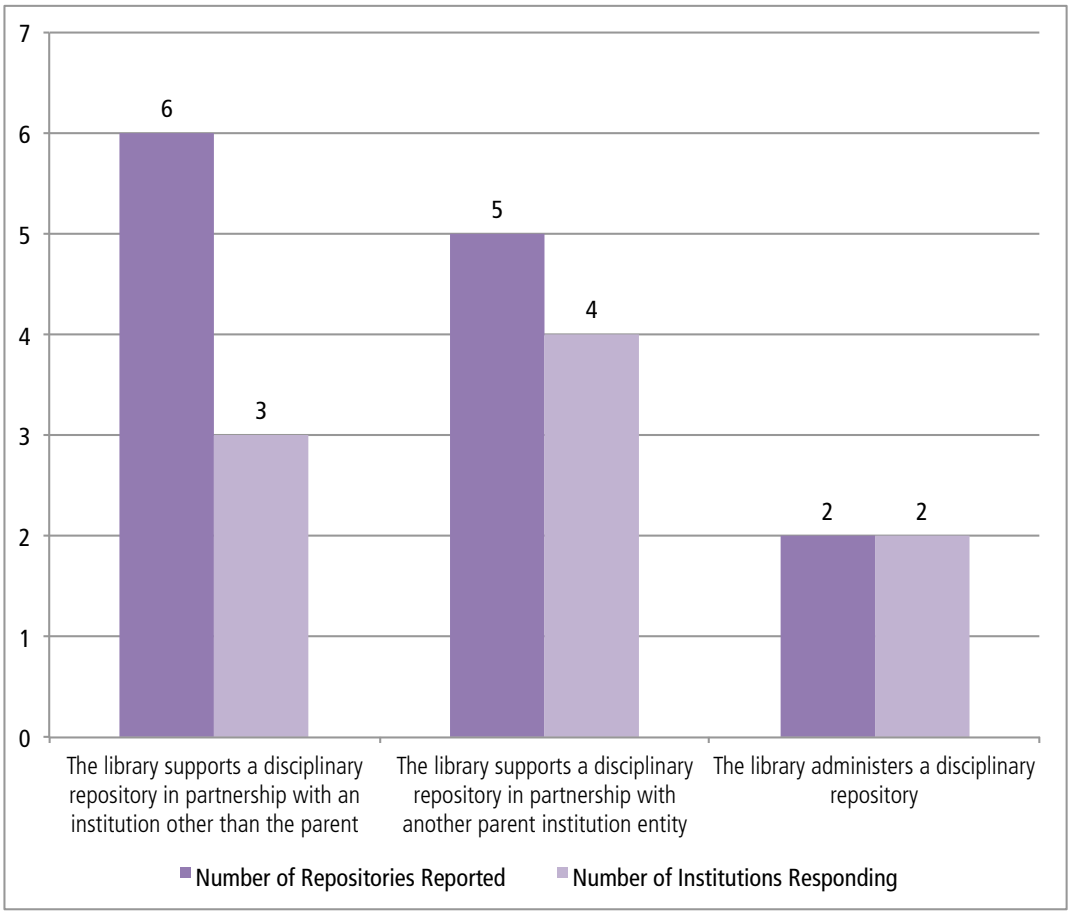


Table 5. Funding and Sustainability of Each Repository

Repository	Institution	Funding Model	External Grant Funding	Sustainable	Sustainability Plan	Budget
AgEcon Search	University of Minnesota	Internal library regular budget, One-time supplemental funds, Endowment fund, External grant funding	USDA National Agriculture Library, CME Foundation, Farm Foundation, AAEA Trust	Yes	No	102,000
PubMed Central®	National Library of Medicine	Parent institution budget		Yes	Yes	
HABRI Central	Purdue University	External grant funding	HABRI Foundation	Yes	Yes	350,000
Industry Studies Working Papers	University of Pittsburgh	Internal library regular budget		Yes	No	
InterNano	University of Massachusetts Amherst	External grant funding	National Science Foundation	No	In development	150,000
The Aphasiology Archive	University of Pittsburgh	Internal library regular budget		Yes	Yes	
Dryad	North Carolina State University	External grant funding, Membership fees, data publication charges, foundations, private donors	National Science Foundation	Yes	Yes	
PhilSci	University of Pittsburgh	Internal library regular budget		Yes	Yes	
RIIC-4MMDP	University of Pittsburgh	Internal library regular budget, External funding by non-profit partnership		Yes	No	
Archive of European Integration	University of Pittsburgh	Internal library regular budget		Yes	Yes	

Repository	Institution	Funding Model	External Grant Funding	Sustainable	Sustainability Plan	Budget
tDAR	Arizona State University	External grant funding, Contracts for digital archiving services and digital curation services	Andrew W. Mellon Foundation; National Science Foundation; National Endowment for the Humanities	Yes	Yes	800,000
Minority Health and Health Equity Archive	University of Pittsburgh	Internal library regular budget, External grant funding, Funding from the University of Maryland, separate from the University Library System, University of Pittsburgh funding		Yes	No	

In these repositories, staff sizes range from three to ten individuals representing 1.8 to 7.8 FTE. Staff positions are typically permanent, which may be related to the strong assertion that the funding models are believed to be sustainable. While many of the positions are full time, especially the project manager or director, it is unclear what percentage of those and other positions are dedicated exclusively to repository support.

Staff size does not seem related to collection size. The extent to which specialized subject knowledge is needed also varies.

Advisory boards seem to be an integral part of disciplinary repositories, involved with aspects of their development and administration. Nine of the 12 case study repositories have an advisory board, each with academic members, but the boards also include industry, government, and nonprofit representatives (see Figure 3). Seven of these boards were formed in the planning stages. Advisory boards are quite active, influencing the strategic direction, sustainability, outreach, policies, and collections activities of the repositories. However, they are not typically involved in the day-to-day workflows of the repositories (see Figure 4).

Figure 3: Advisory Board Member Composition

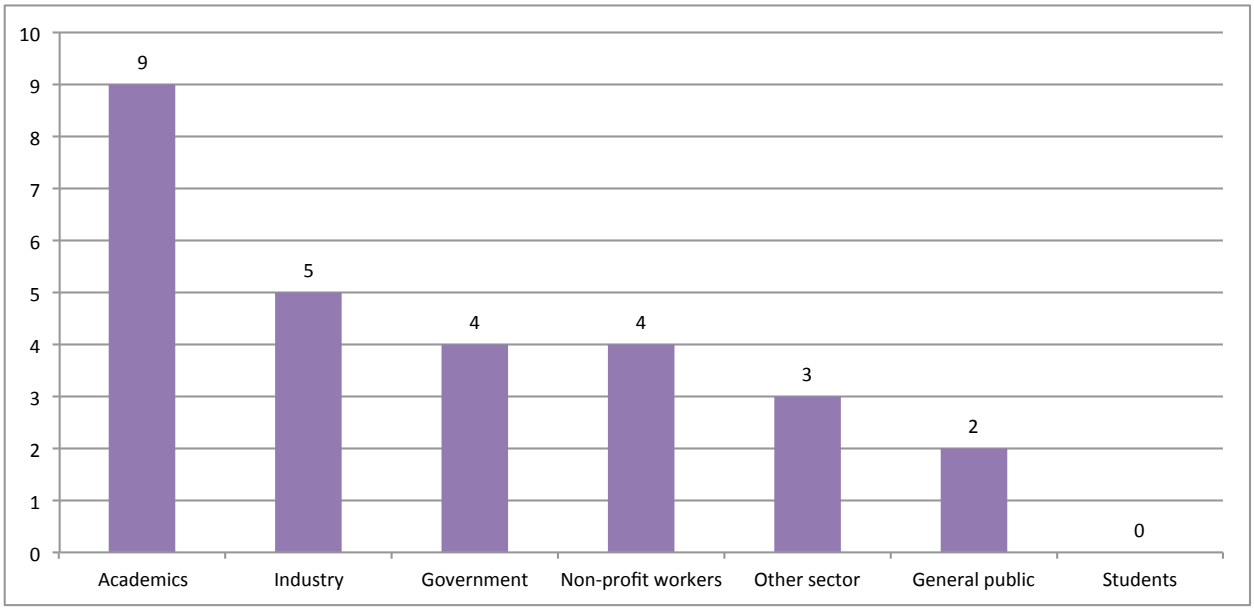
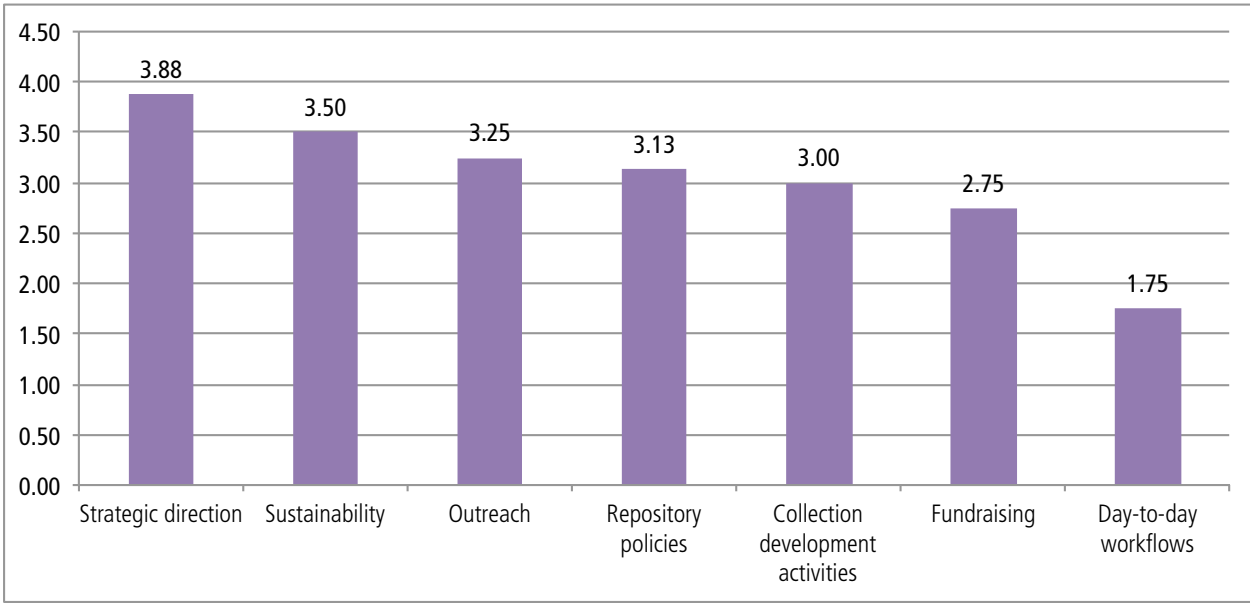
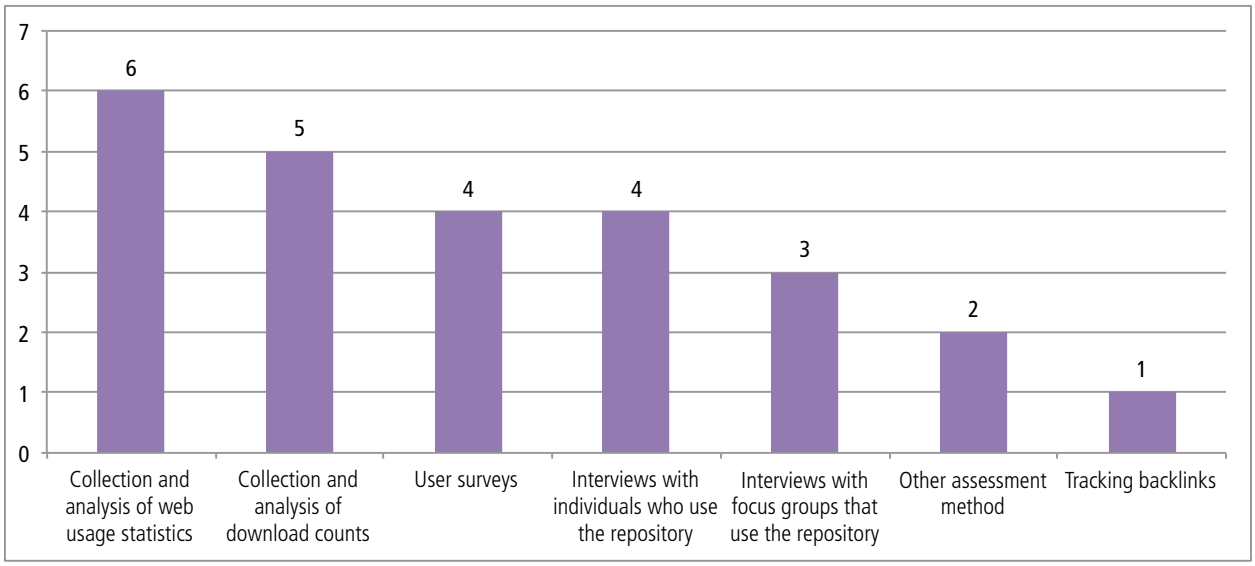


Figure 4: Influence of Advisory Board: 1 is no influence and 4 is large influence



Of the seven case study institutions, four are assessing and two are planning to assess effectiveness. Web use statistics and download counts are the most widespread assessment techniques in use or being planned. User surveys, interviews, and focus groups have also been conducted (see Figure 5). One institution involved with six repositories does not plan to conduct assessment.

Figure 5: Assessment Methods



Conclusion

It is a challenge to identify common aspects of disciplinary repository management that can be abstracted from the particulars of their community focus and individual funding models. While disciplinary communities do hold in common a dedication to broadening access to their research outputs, they assemble a variety of administrative models, collection development strategies, and outreach mechanisms to accomplish their dissemination goals.

Library-Managed Repositories

Institution	Repository Name	Link
University of Minnesota	AgEcon Search	http://ageconsearch.umn.edu/
National Library of Medicine	PubMed Central®	http://www.ncbi.nlm.nih.gov/pmc/
Purdue University	HABRI Central	http://www.habricentral.org
University of Pittsburgh	Industry Studies Working Papers	http://isapapers.pitt.edu
University of Massachusetts Amherst	InterNano	http://www.internano.org/
University of Pittsburgh	The Aphasiology Archive	http://aphasiology.pitt.edu
Indiana University	Digital Library of the Commons	http://dlc.dlib.indiana.edu/dlc/
North Carolina State University	Dryad	https://datadryad.org/
University of Pittsburgh	PhilSci-Archive	http://philsci-archive.pitt.edu/
University of Pittsburgh	Resources in Integrated Care for Morbidity Management and Disability Prevention (RIIC-4MMDP)	http://www.riic4mmdp.org
University of Pittsburgh	Archive of European Integration	http://aei.pitt.edu/
Arizona State University	The Digital Archaeological Record (tDAR)	http://www.tdar.org/
University of Pittsburgh	Minority Health and Health Equity Archive	http://minority-health.pitt.edu

Repositories Identified through the Survey that are Based at ARL Institutions, but not Managed by the Library

Institution	Repository Name	Link
Pennsylvania State University	CiteSeerX	http://citeseerx.ist.psu.edu/index
Purdue University	C3Bio	http://c3bio.org/
Purdue University	CatalyzeCare	https://catalyzecare.org/
Purdue University	cceHUB	https://ccehub.org/
Purdue University	CLEERHub	http://cleerhub.org/
Purdue University	CUAHD	http://cuahd.org/
Purdue University	driNET	https://drinet.hubzero.org/
Purdue University	GEOSHARE	http://geoshareproject.org/
Purdue University	GlobalHUB	https://globalhub.org/
Purdue University	IASHub	http://isahub.com/
Purdue University	Indiana CTSI	https://www.indianactsi.org/
Purdue University	manufacturingHUB	http://manufacturinghub.org/
Purdue University	memsHUB	https://memshub.org/
Purdue University	nanoHUB	http://nanohub.org/
Purdue University	NEEShub	http://nees.org/
Purdue University	pharmaHUB	http://pharmahub.org/
Purdue University	STEMEdhub	http://stemedhub.org/
University of Connecticut	Global Cestode Database	http://tapewormdb.uconn.edu/
University of Connecticut	Trust-Hub	https://www.trust-hub.org/
University of Michigan	Inter-university Consortium for Political and Social Research (ICPSR)	http://www.icpsr.umich.edu/icpsrweb/landing.jsp
University of North Carolina at Chapel Hill	Dryad	http://datadryad.org/
York University	HTP Prints	http://htpprints.yorku.ca/

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Endnotes

1 Scholarly materials may include materials such as pre-prints, post-prints, working papers, and data.

2 Indiana University (IU) identified the Digital Library of the Commons (DLC), to which their Libraries have provided technical support. IU did not complete the survey, so the DLC is not included as a case study.

3 http://www.eprints.org/us/

4 http://www.dspace.org/

5 http://hubzero.org/

6 https://www.ncbi.nlm.nih.gov/

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