Abstract. In the interest of providing access to and preserving scholarship produced by faculty, students and staff, many universities have developed and implemented institutional repositories. Repositories are often organized into communities that correspond to campus units, including departments, research centers and institutes, and administrative offices. Universities, however, frequently undergo academic restructuring, which can make repository organization out of sync with university organization. This article addresses the impact of academic restructuring on repositories and looks to practices from archival arrangement and description to create repository organizational structures and community descriptions flexible enough to reflect university organization, despite changes arising from academic restructuring.

Keywords: Institutional Repositories, Academic Restructuring, Archival Arrangement, Archival Description
In the past decade, many universities have developed and implemented institutional repositories that collect, manage, preserve, and provide access to the scholarship created by the faculty, students, and staff of the university. Many repositories are organized into communities that mirror the university's organizational structure.

Contemporaneous with the growth of institutional repositories has been a continuation of academic restructuring at many universities. Growing in frequency in the 1990s, universities have responded to the emergence of new academic disciplines with the creation of new departments, programs, centers, and institutes. Meanwhile, shifting academic priorities, increasingly constrained financial and other resources, growing pressure from external stakeholders, and other factors have spurred universities to shutter or merge campus units. A 1994 survey found that, “half [of the campuses surveyed] reorganized academic units, 40 percent consolidated programs, and two-thirds created new academic programs” (as cited in Hendrickson, Maitland & Rhoades, 1996, p. 51).

Academic restructuring can have a major impact the organization of institutional repositories. If repository managers perform maintenance to ensure communities accurately reflect university organization, what should be done when campus units are divided or merged? What can repository managers do to ensure that continuity between predecessor and successor units is maintained against an ever-changing campus environment?

This article discusses how Iowa State University's institutional repository, Digital Repository@ Iowa State University, relies on archival theory and practice,
particularly archival arrangement and description, as a guide when creating organizational structures and community descriptions. This enables the repository to provide the academic and administrative contexts for scholarship and to reflect changes made to campus organization over time. The format of the community descriptions found in Digital Repository @ Iowa State University are derived from the ISAAR (CPF): International Standard Archival Authority Record for Corporations, Persons and Families, a standard designed for archivists to describe records creators.

**Literature Review**

**Organization of Institutional Repositories**

Most repositories are organized into communities that correspond to campus units, including colleges, academic departments and programs, research centers, and institutes, and administrative offices (Nabe, 2010). For some repositories, the community-based structure of the repository allows campus units to appoint community managers and set community policies on content and access (Connell, 2011). The ability to organize repository content into communities is a feature of DSpace, Fedora, and Digital Commons, three of the most widely used repository platforms (Nabe, 2010).

Jones, Andrew, and MacColl (2006) outline two requirements for repository structures: the needs of users depositing content, and the needs of users who are seeking content. The first group needs to be able to identify the proper communities in which to deposit their content. For the second group, “the accuracy of categorisation is secondary” (p. 100), who will locate content primarily through
searching. The authors advocate a simplified, shallow structure, where top-level collections represent “approximately equal entities within the institution” (p. 103), rather than a deep structure with levels of communities and sub-communities that mirror the hierarchical structure of the university.

An analysis of repository organization in ARL member libraries revealed that the vast majority of repositories organized their contents, in part or in whole, into communities that were aligned with campus units or departments (Mercer, Koenig, McGeachin, & Tucker, 2011). The authors confirmed these findings in a follow-up survey of ARL repository managers, where 31 of 35 survey respondents indicated that the organization of their repositories replicated, at least in part, their universities’ organizational structures.

Although authors have mentioned the necessity to adjust repository organization in light of departmental name changes or mergers, few have discussed how repositories should adjust their organization to reflect these changes. Mercer, et al. (2011), point to academic restructuring as a major factor leading repositories to adjust their organizational structure. Other authors who discuss the impact of academic restructuring on institutional repositories focus on effects on repository metadata. Jones et al. (2006) stress that naming conventions for repository communities should be “flexible enough to deal with departments which can change or merge with others, as is relatively common” (p. 105). Jones (2007) suggests repository managers think about “future-proofing” repository structures for departmental changes and showing structural changes in the repository’s metadata.

Institutional Repositories and Archival Theory and Practice
Many authors have recognized the overlapping missions of institutional repositories and university archives, particularly when discussing their scopes of acquisition (Bicknese, 2003–2004; Connell, 2011). For Lynch (2003), an effective institutional repository includes archivists and records managers amongst its collaborators. Crow (2002) posits that the relationship between institutional repositories and archives may be complementary or competitive.

Authors writing on the potential contributions of archivists to institutional repository management typically focus on content selection, content acquisition and digital preservation (Walters, 2007; Sauer, 2009; Yakel, Rieh, St. Jean, Markey, & Kim, 2008). Walters also points to archivists’ familiarity in dealing with access restrictions and developing retention schedules, while Sauer discusses donor relations. Watterworth (2009) and Bicknese (2003–2004) discuss the potential of using institutional repositories to manage electronic records held in archives.

Focusing on digital preservation, Duranti (2010) and O’Meara and Tuomala (2012) look at how institutional repositories can maintain the authenticity of records they manage.

The application of archival arrangement and description to the management of institutional repositories has not been explored in great depth. Bicknese (2003–2004) draws a parallel between the community-based organization of repositories and the archival principle of provenance, writing, “The files will […] be organized by provenance using the ‘communities’ feature of programs such as DSpace” (p. 90). In a nod to archival description, Bicknese writes, “the archivist could also ensure that
the system contains sufficient metadata to document the provenance of the collection” (p. 90).

**Academic Restructuring and Institutional Repositories**

Academic restructuring is a response by colleges and universities to changing expectations from both the campus community (including faculty, staff, administrators, students, and alumni), and external stakeholders and influencers (which may include the government, granting agencies, peer academic institutions, employers, and the public at large). The academic environment evolves to keep pace with the challenges facing society as new disciplines emerge and others are cast aside.

Supporting new programs requires a reallocation of resources within the university, which spurs academic restructuring, which may involve the emergence of new campus units and the shuttering or merging of existing units. Such moves serve as an indication of the shifting priorities of a university, as “[W]hat has come to count as knowledge has not simply unfolded or evolved out of existing areas, but has resulted in part from the differential valuing and resourcing of academic units competing for epistemological, organizational, and physical space” (Gumport, 2000, p. 83).

For repository managers, academic restructuring can lead to “ongoing maintenance necessitated by name changes and departmental splits and mergers” (Mercer et al., 2011, p. 337). Name changes require updating the metadata associated with communities aligned with the affected units to ensure that the communities accurately reflect the campus units they represent. More significant
instances of academic restructuring may require the creation of new repository communities and a consideration of what should be done with existing communities.

Rich (2006) points out that one of the resources most affected by academic restructuring is the faculty body, writing “The most important restructuring of universities will not be in business practices, but rather in the allocation of academic assets, and specifically in the appointment and organization of faculty” (p. 43). The movement of faculty across academic departments has the potential to cause serious difficulties for repository managers in ensuring all works created by an individual faculty member are available in one location. When adjusting repository organization in light of academic restructuring, it is important to enable a sense of continuity for both affected departments and individual faculty members.

Some repository managers believe that “making changes to the repository [is] unnecessary, due to the library’s belief that end users arrived at repository items from outside search engines rather than by browsing through the repository’s organizational structure” (Mercer et al., 2011, p. 336). This view, however, ignores users that arrive in the repository through means other than search engines, and users who would like to browse the repository to find related materials. Ensuring that the repository’s communities accurately reflect the campus units of the university also has several practical benefits for the repository manager and the campus units represented within.

By ensuring the currency of the repository’s organizational structure, repository managers can provide represented campus units with a sense of
ownership over their repository communities. When repository communities accurately reflect their campus unit counterparts, it facilitates cross-linking between the repository and the campus unit’s web site, making it easy for the unit to highlight its scholarly output. It would be difficult for campus units to link to their respective repository communities if the community had an outdated name or represented defunct units.

For some institutional repositories, Nabe (2010) writes, “[a]llocating some administrative responsibilities to a variety of people in the institution is common, sensible, and even desirable. Regardless of platform, [repositories] are divided into communities and collections, each of which requires an administrator” (p. 49). If repository managers choose to devolve some of the responsibilities of community and collection management to campus units, then having communities that accurately map to campus units will make the selection of a community or collection administrator simpler. With a one-to-one mapping, repository managers can identify an administrator who is familiar with the campus unit, its represented disciplines, research focus areas, community members, policies and needs.

Reflecting academic restructuring in an institutional repository also provides users with insight into the history and the shifting priorities of the university itself. The presence or absence of academic departments, the naming of campus units, and the changes made to academic organization reveal much about the priorities of the university and society at large. Thus, accurately linking scholarship to the campus units that create them, and adapting repository organization to accommodate academic restructuring, provides insight into broader changes in the campus and
the scholarly landscape. The provision of richer contextual information adds an additional layer of meaning to the scholarship being done on campus.

**Archival Arrangement and Description**

Arrangement, in archival terms, is “[t]he process of organizing materials with respect to their provenance and original order, to protect their context and to achieve physical or intellectual control over the materials” (Pearce-Moses, 2005, p. 34–35). Context is a cornerstone of archival practice, providing means for demonstrating the authenticity of records and providing users with information about the creators, creation and use of the records. This contextual information brings meaning to the records beyond the words and images captured on them.

One of the core tenets of archival arrangement is the principle of provenance, which states that “records of different origins (provenance) be kept separate to preserve their context” (Pearce-Moses, 2005, p. 317). This means that records from one records creator must be kept separate from the records from another records creator. Adapted to the institutional repository context, parallels can be drawn between records creators and campus units—scholarship produced by faculty, students, and staff of one campus unit should be kept separate from scholarship created by another campus unit. Drawing from the principle of provenance will aid repository managers and community administrators in determining where in the repository organization to deposit scholarship created by faculty, students, or staff whose departments have been affected by mergers or divisions. If a Department of Philosophy and a Department of Religious Studies merge to form a new Department of Philosophy and Religious Studies, repository managers can create a new
community for the merged department, rather than continuing to deposit
scholarship into the communities for the two defunct departments.

Archival description is “the creation of an accurate representation of the
archival material [...] that serves to identify archival material and to explain the
context and records systems that produced it, as well as the results of these
processes” (Society of American Archivists, 2013, p. xvi). Where archival
arrangement determines the intellectual and physical organization of an archives
(grouping records intellectually by records creators and by the functions and
activities that generated those records, and arranging the records physically into
boxes and onto shelves, for example), archival description (often taking the form of
finding aids) captures the archives’ intellectual and physical arrangement, providing
users access to those records. Bibliographic and archival description both serve to
provide access points to information. However, as Roe (2005) writes, “Archival
description, unlike library cataloging, also goes beyond the content and physical
description of the records themselves. Information to manage and interpret the
records is also essential to description” (p. 14). Such information includes
biographical and/or administrative histories and relationships to other record
groups and records creators.

Often tasked with managing the records of complex organizations, archivists
are familiar with working with records generated by functions and activities that
move from one unit to another. Archival descriptive standards allow archivists to
demonstrate relationships between related records creators in their finding aids.
The eighth principle of Describing Archives: A Content Standard (DACS), the
archival descriptive standard developed by the Society of American Archivists (2013), states, “standardized access points must be provided that indicate not just the primary creator but also the relationships between successive creators, for example, parts of a corporate body that has undergone reorganization(s)” (p. xix).

To illustrate, if responsibility for issuing identification cards is transferred from the Office of Student Services to a newly created Identification Card Office, then finding aids describing the records of the Identification Card Office will point to similar records created by the Office of the Student Services, which previously served that function.

Where archivists trace the movement of records-generating functions and activities from administrative unit to administrative unit, institutional repositories should be aware of when responsibilities for research and teaching activities in academic disciplines move from one campus unit to another. Descriptions provided for repository communities should identify these moves. When research and teaching in philosophy moves into the new Department of Philosophy and Religious Studies, the description for the new department’s community should link to the communities of its predecessors. Disciplinary continuity can be maintained and identified within the repository’s organizational structure.

In drawing from archival arrangement and description to illuminate the administrative and academic contexts of the scholarship contained in institutional repositories, a new layer of meaning is added to the works. Rich (2006) writes, “faculty are organized as communities of scholars in disciplinary departments clustered in colleges that purportedly represent reasonable pathways for how
scholarship should be produced and how students should be educated” (p. 43). Academic departments and other campus units have great influence on the scholarship produced at a university. The creation and elimination of academic departments and programs “limits the scope of academic knowledge that students are offered on any given campus, with the longer range potential of further stratifying who learns what” (Gumport, 2000, p. 84). Through the hiring of faculty members, researchers, and post-doctorates, and the admission of graduate students, academic departments define and reinforce their research focus areas. Tenure and promotion policies, along with the influence of departmental colleagues, determine the nature, level, and amount of scholarship produced. By aggregating the scholarly output of campus units, institutional repositories have the potential to not only provide open access to scholarship but have the power to supplement university archives by providing insight on the scholarly environment of those campus units, as well.

**Using Archival Arrangement and Description in Digital Repository @ Iowa State University**

Digital Repository @ Iowa State University was launched in April 2012, using Bepress’s Digital Commons platform. The initial deposit consisted of over 2,000 electronic theses and dissertations written by students graduating between 2008 and 2012. That summer saw academic restructuring in two of the university’s colleges: the Department of Art and Design, housed within the College of Design, was divided into four separate departments: Graphic Design, Industrial Design, Integrated Studio Arts, and Interior Design. In the College of Human Sciences, the
departments of Educational Leadership and Policy Studies, and Curriculum and Instruction were merged to create a School of Education.

All of the involved departments contained thesis-producing graduate programs. Theses and dissertations are a valuable part of a university’s scholarly output, demonstrating the breadth and strength of graduate research being done on campus. As evidence that a graduate student has partially fulfilled his or her requirements for graduation, theses and dissertations are official university records (SAA College and University Archives Committee, 1992). Given the deposit of electronic theses and dissertations into the repository, the status of theses and dissertations as official university records, and the newness of the repository, the Digital Repository Coordinator was able to use the academic restructuring as an opportunity to reexamine the organization of the repository and tweak it so it could be responsive to past and future instances of academic restructuring.

Following the archival principle of provenance, scholarship is deposited in Digital Repository @ Iowa State University in the communities aligning with the campus units that existed when the scholarship was created (rather than the campus units in existence when the work was deposited), as determined by the department affiliation identified in the work. This meant that new communities were established for the four newly established design departments and for the School of Education; however, bridges needed to be made between the predecessor and successor units to provide a sense of continuity in scholarship in academic disciplines affected by the academic restructuring. For example, links needed to be created between the Graphic Design community and its predecessor, Art and Design,
so users browsing the repository can find scholarship on graphic design written before 2012.

In order to represent disciplinary continuity amongst academic restructuring, the repository developed its community descriptions based on archival authority records (see Appendix A). ISAAR (CPF), developed by the International Council on Archives, is a standard outlining the description of corporations, persons, and families involved in the creation of records in archival authority records. Adapting elements from ISAAR (CPF), Digital Repository @ Iowa State University decided to include the following sections in its community descriptions: Community Name, Community Description, History, Dates of Existence, Historical Names, Related Units and Related Resources (see Appendix B). This allows the community descriptions to provide repository visitors with information about the academic disciplines covered by campus units, research and teaching activities carried out by the unit, a history of the unit, links to related campus units, and related resources.

The Community Name is drawn from the name of the campus unit, providing a standardized access point and serving as an indication of the disciplinary focus of the unit. The Community Description gives a brief overview of the scholarly activities carried out by the campus unit, including an indication of the academic disciplines covered by the unit, graduate programs offered by the unit, and research and teaching activities carried out by the unit. The History section concisely summarizes academic restructuring that has affected the unit, including creation and closure, mergers and divisions, name changes, changes in status (e.g., from a
program to a department), and moves within the overall university structure (e.g., from one college to another). The Dates of Existence section helps users to determine if the scholarship contained in that community is current or historical, and whether the scholarship in that community fits into the time period the user is interested in.

Linking to Related Units allows repository visitors to trace disciplinary continuity through the academic restructuring, despite any mergers or divisions that may have affected research, teaching, and administrative activities related to specific academic disciplines. Repository visitors interested in the study of the visual arts at Iowa State University, for example, can go from the current Department of Integrated Studio Arts community to the preceding Department of Art and Design, which had itself changed its name from the Department of Domestic Art and its parent unit from the Division of Home Economics to the College of Design.

In addition to linking between predecessor and successor units, and parent and child units, the community descriptions also allow the repository to link to Related Resources. For Digital Repository @ Iowa State University, this entails linking to non-scholarly archival and manuscript materials made available through Digital Collections, the library's CONTENTdm site. Links can also point users to the finding aids for corresponding records groups in the University Archives when they are made available online. Through these links, the library can present a more holistic view of scholarly production on campus.
Although community descriptions described take time to research and write, the university archives may have already done much of the work. Needed information can be adapted from finding aids and other descriptive tools developed by the archives. By collaborating with the university archives, repository managers can ensure that repository communities are aligned with archival record groups, facilitating collaboration and links between the two.

A student assistant researched and wrote histories of departments represented in the repository using university catalogs and other archival material held by the library’s Special Collections Department (Spick, 2013). The resulting descriptions, formatted in HTML, were then added to the metadata describing each community.

Where the community descriptions help the repository provide continuity for academic disciplines, academic restructuring can divide the works of a faculty member across several communities as well. Works for faculty members in Graphic Design whose tenure at Iowa State University spanned the 2012 division of the Department of Art and Design will find their works split between the two communities. Repository staff members create SelectedWorks author profiles for faculty and staff who have contributed content to the repository. These profiles provide a solution to this problem, as they aggregate all content written by the author found in the repository, regardless of the community in which it was deposited. This presents all of the works by the author on a single page. By adding the author’s current and prior positions and titles to his or her biographical
information, users can trace the campus units the author has been affiliated with during his or her tenure at Iowa State.

**Conclusion**

Both institutional repositories and university archives have similar goals. They both aim to capture and provide access to the documentary output (whether scholarly, administrative or historical) of their host universities, and they are concerned with the university as a whole. Both institutional repositories and university archives require close relationships with campus units, faculty and staff in order to successfully fulfill their missions.

Because of the similarities between the two, the relatively new arena of institutional repository management can benefit greatly by drawing from archival theory and practice. As demonstrated in this article, archivists’ familiarity with the documentary output of complex organizations can benefit repository managers dealing with complex university organizations and academic restructuring. When communities in institutional repositories are aligned with archival record groups, links can easily be made between the repository and digitized archival materials, exhibits, finding aids, and other digital outputs created by university archives. In drawing from archival arrangement and description, when depositing materials in their repositories, repository managers can answer the question, ‘Where does this belong?’

As Digital Repository @ Iowa State University continues to develop its organizational structure, several areas for improvement have emerged. Currently, the community descriptions in the repository are encoded in html and entered in to
the “Introductory Text” metadata field offered by Digital Commons. Ideally, each
section of the community descriptions would be entered as separate metadata
elements, which would allow conformity with the Encoded Archival Context (EAC)
standard. This would facilitate searching of community descriptions as well as the
sharing and reuse of these descriptions. The repository is also exploring the use of
microdata to enhance the indexing and discoverability of community descriptions in
search engines.

Although there is room for improvement, drawing from principles and
practices from archival arrangement has proven beneficial in developing a
repository organization flexible enough to withstand academic restructuring in
creating descriptions for repository communities that maintain disciplinary
continuity through these changes. Any institutional repository that organizes its
content into communities can utilize the approach to community descriptions
outlined in this article, including newly founded repositories and well-established
ones. As it requires changing descriptive metadata about the communities, it can be
adopted without requiring any adjustments to the organizational structure of the
repository. It can be applied equally to repositories employing shallow or deep
hierarchical structures. This approach serves as a practical example of the benefits
archival theory and practice can provide repository managers.
References


APPENDIX A: Community Description for Department of Art and Design

Department of Art and Design

The Department of Art and Design offered the degree Bachelor of Fine Arts in three curricular areas: Graphic Design, Integrated Studio Arts, and Interior Design. The department also offered the degree Bachelor of Arts in Art and Design. The department also participated in the undergraduate minor in design studies.

The department offered the degrees of Master of Fine Arts in Graphic Design, Integrated Visual Arts and Interior Design, and Master of Arts in Art and Design, with degree specialization in interior design, graphic design and environmental graphic design. Graduates have a broad understanding of visual communication, problem-solving, and interdisciplinary studies.

History

The Department of Applied Art was first recognized as a department in the Division of Home Economics in 1919. The department was incorporated into the College of Design in 1978. The name was changed to the Department of Art and Design in November 1978. In 2012, the Department of Art and Design was divided into four departments: Graphic Design, Industrial Design, Interior Design, and Integrated Studio Arts.

Dates of Existence

1919–2012

Historical Names

- Department of Applied Art
- Department of Domestic Art
Related Units

- College of Home Economics (*previous college*, 1919–1978)
- Department of Graphic Design (*successor*, 2012)
- Department of Industrial Design (*successor*, 2012)
- Department of Integrated Studio Arts (*successor*, 2012)
- Department of Interior Design (*successor*, 2012)

Related Resources

- Department of Art and Design, Iowa State University Archives
- Christian Peterson, Iowa State University Library Digital Collections
### APPENDIX B: ISAAR (CPF) Elements and Digital Repository @ Iowa State

#### University Community Description Headings

<table>
<thead>
<tr>
<th>Repository Heading</th>
<th>Purpose</th>
<th>ISAAR (CPF) Element[^1]</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Name</td>
<td>Used to indicate the current, formal name of the campus unit</td>
<td>5.1.2 Authorized form(s) of name</td>
<td>To create an authorized access point that uniquely identifies a corporate body, person or family</td>
</tr>
<tr>
<td>Community Description</td>
<td>A description of the academic discipline(s) covered by the campus unit, and research, teaching and outreach activities</td>
<td>5.2.5 Functions, occupations and activities</td>
<td>To indicate the functions, occupations and activities performed by the corporate body, person or family</td>
</tr>
<tr>
<td>History</td>
<td>A history of the campus unit focusing specifically on academic restructuring, including the unit’s creation and any mergers, divisions, renamings and closures</td>
<td>5.2.2 History</td>
<td>To provide a concise history of the corporate body, person or family</td>
</tr>
<tr>
<td>Dates of Existence</td>
<td>Indicate the founding year and, if application, year of closure of the campus unit</td>
<td>5.2.1 Dates of existence</td>
<td>To indicate the dates of existence of the corporate body, person or family</td>
</tr>
<tr>
<td>Historical Names</td>
<td>An indication of historical names used by the department and the dates those names were used</td>
<td>5.1.5 Other forms of name</td>
<td>To indicate any other name(s) for the corporate body, person or family not used elsewhere in the Identity Area</td>
</tr>
</tbody>
</table>

| Related Units                                                                 | List and link to related IR communities, including predecessors, successors, parent units and child units | 5.2.1 Names/identifiers of related corporate bodies, persons or families  
5.2.3 Description of relationship  
5.2.4 Dates of the relationship | Describe relationships with other corporate bodies, persons and families as may be described in other authority records |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Related Resources                                                             | List and link to related digital resources maintained by the Iowa State University Library                  | 6.1 Identifiers and titles of related resources  
6.2 Nature of relationships                                                                 | [L]ink the authority records to descriptions of records. Archival authority records can also be linked to other relevant information resources. |