

## **Overwhelmed to Action: Digital Preservation Challenges at the Under-resourced Institution**

Rinehart, Amanda, Patrice-Andre Prud'homme, and Andrew Huot

Suggested citation:

Rinehart, Amanda, Patrice-Andre Prud'homme, and Andrew Huot. 2014. *Overwhelmed to action: digital preservation at the under-resourced institution*. OCLC Systems and Services, Digital Preservation Special Edition, 30(1): 28-42. Available at: <http://www.emeraldinsight.com/journals.htm?articleid=17103689>

# **Overwhelmed to Action: Digital Preservation Challenges at the Under-resourced Institution**

## **Introduction**

Librarians have been hearing about digital preservation (DP) for a while. As a data librarian, the subject comes up when discussing data management plan mandates from various funding agencies. As a preservationist, it lies outside the daily workflow but is material that should be preserved. As a librarian who selects and transforms unique materials into digital collections, it is important to ensure that these digital assets are not lost in a few years. Regardless of the job description, it is important that valuable collections do not deteriorate or become lost.

However, the reality for a small or mid-sized institution is that there is high competition for dwindling resources and not much DP training translates into action. When DP is not part of existing position descriptions, and there is no funding to hire an expert, how does an institution begin to tackle the challenge? The pressure to start working on it immediately, before any content is lost, just adds to the impression of impossibility. As a partner institution in an Institute of Museum and Library Services (IMLS) National Leadership Grant, Milner library has had the privilege of consulting with some of the best DP experts in the nation. This paper reveals some lessons learned and how Milner Library has gone from overwhelmed to action.

“Preservation is the state at which everything that is important about a file is still capable of being examined by a human being...it’s not about individual records or bits, it’s about allowing humans to understand” (McDonough, 2012). Often it can be easy to get lost in the technological details of DP and lose sight of the ultimate goal. For instance, the CARLI white paper (2010, p. 2) defines DP as “a commitment to maintain long-term access to digital objects through standardization, migration, and replication of those objects on numerous servers in multiple locations.” Therefore, DP is really “a multi-faceted problem that is viewed differently by different institutions and different professionals” (Hedstrom and Montgomery, 1998, p. 7). The term is defined broadly because it encompasses a variety of activities pertaining to the continued value of digital information (Hedstrom, 1998). Certainly, those who are concerned about DP at Milner Library found that choosing which facet to tackle is the first challenge.

Initially, in order to facilitate a common understanding between library staff, DP advocates at Milner focused on the misconceptions about DP. The following will further explain some of these misconceptions.

## **Misconceptions of digital preservation**

One misconception of DP is that if an item is accessible, then it is preserved. “Preservation and access are different” (McDonough, 2012). In fact, access is not required for DP at all, although it may be a desired component. As well, access may be seen as a higher priority and provide more immediate satisfaction than DP, particularly to users or other

constituents. However, without preservation, access is not reliable over time. Even as early as 1998, “some collection managers expressed concerns that institutions would sidestep the issue of long-term preservation [in favor of providing] access to materials, and that at some point this approach would fail, leaving institutions with a preservation crisis” (Hedstrom and Montgomery, 1998, p. 21). In order to avoid this crisis, libraries need to be thoughtful about how resources are distributed in order to make sure that DP is not forgotten.

The difference between digitization and preservation is another potentially misunderstood component of DP. “Digitization does not equal preservation” (Halbert, 2012). The act of digitally transforming analogs still remains confusing with the array of standards and formats for digital surrogates, while poor quality digitization prevents adequate long-term digital preservation. When NASA accidentally erased the high quality recordings of the Apollo 11 moon landing in the 1980s, they eliminated any possibility of future high resolution analysis with more modern technology (Greenfieldboyce, 2009). Recordings of the event still exist, but only of low quality TV broadcasts. This is a prime example of how non-experts can interpret any digitization as digital preservation. Digitization must meet current standards and guidelines in order to achieve suitable quality for long-term preservation. Some of these standards are well-established (Puglia, Ree, and Rhodes, 2004), while others are on-going conversations (Library of Congress, n.d., NDSA Standards ). Knowing how to seek the most relevant information and adhere to the best possible practice is essential to both adequate DP and the efficient use of limited resources.

Most institutions and individuals understand the need to backup data, but may not realize the difficulty of assuring the preservation of knowledge for years to come (Harvey, 2005). “Backup is a component of preservation, not preservation itself” (Bishoff, 2012). At the end of the day, there is the false assurance that data are safe because it exists in multiple copies. However, typical storage media, such as the recommended fast magnetic disks or tapes, are still vulnerable to damage from such dangers as electromagnetic fields (McGath, 2012). Digital media, similar to the materials that make up physical texts, is also at risk of corruption, or degradation. This is colloquially called “bit rot.”

Additionally, any collection of files that fail to have accompanying documentation (or metadata) is left without context. Metadata becomes comparatively more important in the non-tangible world, as it is the sole guarantor of the provenance and meaning of the digital files. Without metadata, backups are the organizational equivalent of throwing all of one’s papers in one disorganized pile in a large drawer. Depending on the type of digital material, and the intent of the collection, appropriate metadata could vary widely. Becker and Riley (2010) created a visualization of accepted metadata standards for a variety of digital materials and part of DP is to choose the most appropriate schema.

Even if materials are digitized appropriately, metadata attached, and backed-up, they may become inaccessible very quickly. The fast rate of technological change calls for greater attention to format and media storage. How many files have been made inaccessible due to the lack of floppy drives? A survey of 54 institutions found that collection managers view technology obsolescence as the greatest threat to sustain the continuous access to digital

resources (Hedstrom and Montgomery, 1998). DP requires periodic transformations, which is a marked difference from traditional preservation, where minimal handling is desirable.

### **Restricted resources**

Institutions are between a rock and a hard place when facing rapidly changing technologies and the sheer volume of digital creation. Across the nation, university archives, libraries, and other types of repositories are trying to meet “escalating user expectations with limited financial and technical resources” (Hedstrom, 1998, p. 193). Due to the exponential creation of born-digital materials, information is being lost nearly as soon as the digital assets are produced. Although Harvey (2005, p. 188) points out that there is a “lack of concrete knowledge of how much [digital preservation will] cost”, there is a general assumption that any cost is too much, particularly when overall funding is being cut. Although only 41% of surveyed institutions who are not participating in DP programs cited cost concerns, all institutions ranked the three top DP concerns as additional costs, lack of staff resources, and budgets (Meddings, 2011).

### *Change fatigue*

Lack of funding is not the only restricted resource. It is not uncommon to find that librarians suffer from change fatigue, lack of practical knowledge, and lack of engagement. Being prepared to encounter and work through these issues is key to overcoming frustration and discouragement.

Like many libraries, Milner Library has been through a number of organizational and physical changes in recent years. Originally, each level of our six-floor building operated with a great deal of autonomy. As duplication was identified, the six floors were merged into one modern library structure, de facto creating a reorganization of staff. As well, the entire history of the physical building has been fraught with difficulty (Boyd, 2001). A combination of delayed building maintenance and initial poor construction resulted in portions of the building being unfit for public use. These spaces are currently used for closed stacks, but not without significant changes to retrieval workflows and on-going water control measures. With the influx of technology in the last thirty years, electrical requirements have increased and student expectations have changed. These trends have placed additional pressures on space planning decisions and print collection deselection. These organizational and physical changes contribute to change fatigue.

Similar to many other academic libraries across the nation, Milner has seen leadership come and go, technology become pervasive and the budget significantly cut. As several University Librarians have noted, the “upheaval and disruptive events that had preceded their arrival at the respective institution...restricted innovative activities for extended periods of time” and “we’re our own worst enemy - the big threat is ourselves. Especially being unwilling to accept and project ourselves into new environments” (Jantz, 2012, p.13). This change fatigue can mean that the burden of another activity is often met with valid expressions of disbelief and

resistance. Understandably, the scope and volume of DP often invokes this reaction. Again, the refrain that “this is not a technical problem, it’s an organizational problem,” rings true (Kolowich, 2012).

Change inherently causes uncertainty and fear of failure or, as one study phrased it, waiting to see “if someone gets fired” (Jantz, 2012, p.12). This can create a difficult environment for discussing DP. Change can result in “significant stress on librarians and staff to adapt and respond” (Jantz, 2012, p.18). As well, the nature of librarianship in the late twentieth and early twenty-first century has not been conducive to new processes. “Rigidly defined job classifications...encourages ritualistic and unimaginative behavior” and “librarians are trained to follow certain processes - repetitive work that does not lend itself to the generation of new ideas” (Jantz, 2012, p. 12). These professional norms may lead to concern about taking the initiative, with one observation that “librarians [do] not recognize it as their responsibility to speak up” (Jantz, 2012, p. 14). In addition to staff training, creating non-ideological objectives (or clear goals) for the library may help overcome these fears (Jantz, 2012).

#### *Lack of training*

In addition to change fatigue, some librarians have had, or are aware of, negative experiences with digitization projects. One of the dangers of the digital world is expending effort and resources on projects that are unimportant or badly executed. The lack of awareness of standards and best practices is still highly prevalent.

Getting the right information in the right hands at the right time is a problem that has plagued the library community for decades. When adding in the incredible pace of change in the digital environment, limited resources for training and travel, and work days that are already overburdened, it is not surprising that at the local level people forge ahead on projects blissfully unaware of standards and best practices. (Molinaro, 2010, p. 47)

It doesn’t help that “digital preservation is an extremely complex, evolving field that requires a great deal of knowledge to understand” (Duff *et al.*, 2006, p. 203). Concepts that may appear simple to those in the field are often confusing, especially to fellow librarians. Meddings (2011, p. 57) noted that “some respondents were confusing print and digital preservation as well as confusing longer-term preservation with post-cancellation access.” Without a basic overview of the scope and content under discussion, many colleagues are left adrift, attempting to synthesize fragmented information while simultaneously concerned about limited resources and rebounding from periods of change and stress.

Instead of pressure and crisis, Duff *et al.* (2006) identify practical content, real-life experiences, more emphasis on tools and a greater need for contextualization as key components for understanding DP. They also emphasize the need for “a nonthreatening setting where [people] can discuss the problems they are facing in their workplaces” (Duff *et al.*, 2006, p. 201).

As well, emphasizing traditional librarian strengths may make DP concepts relatable. Although librarians may not always be adequately fluent with computer technology, their expertise may be employed in the decision making process of basic preservation and archival principles. Bishoff (2012) notes, “We don’t have to preserve everything at the same level.” It can also be argued that not everything needs to be preserved; it is a question of prioritization. Collection development techniques of selection, organization, and preservation all apply in the digital world.

### *Lack of engagement*

Even when there is willingness and training, it is difficult to engage in DP. Some librarians may feel that they have the mandate to perform digital preservation, but not the authority. In his world-wide study of DP, Meddings (2011, p. 57) found that despite 85% of respondents claiming that “digital preservation is either important or very important to their library”, “less than half of respondents (46.1 percent) stated that they were currently taking steps to ensure the long-term preservation of digital content.”

In Duff *et al.* (2006, p. 188), “networking, increasing confidence levels, and future collaboration were identified as important benefits of the workshops”, however “very few participants were able to implement the skills once they returned to their work environments.” This was not due to the lack of dissemination or awareness of DP issues. Ninety-six percent of the Electronic Resource Preservation and Access Network (ERPANET) workshop participants shared their training with their institutions (Duff *et al.*, 2006). However, “only 35% of respondents said that they implemented the ideas that they learned about at the event” (Duff *et al.*, 2006, p. 199). This lack of “empowering the front lines in the fight for sustainability of our digital heritage” is a real challenge to implementing digital preservation initiatives (Molinaro, 2010, p. 47).

It is difficult to pinpoint the exact nature of this lack of empowerment. Certainly, an organizational culture that is suffering from change fatigue can be discouraging and budgets are universally tight. However, other digital initiatives, such as access points and digitization, receive funding and support. Some possible DP engagement barriers may be organizational, procedural, and leadership related.

It is possible that organizational structures are inhibiting DP, particularly if the digital collections are maintained by separate departments that have different reporting lines. For example, imagine an organization that has an archive that collects historical digital material, subject librarians that initiate and maintain their own digital collections, a digitization center that has their own criteria and collections, and a separate institutional repository. This creates confusion regarding who has ownership of DP. Without a unifying DP organizational structure each unit is a silo who must tackle DP on their own.

While cross-departmental collaboration may overcome the challenge of organizational fragmentation, librarian engagement is complicated by unclear DP processes. If there were easy workflows for all participants then many more people would participate. Developing clear processes requires a like-minded core group that make recommendations to administration about

standards, technology options, feasibility and training. If the group does not have a clear mandate from administration to provide recommendations, or if there is not a mandate to even form a group, then DP collaboration is stymied. In short, grassroots efforts to educate and raise awareness only go so far - ultimately, library administration must provide leadership for DP implementation in order for it to be effective.

### **Talking to Library Administration**

The importance of raising awareness about DP needs to be well articulated in order to gain legitimacy. Specifically, administrators need to “understand that digital preservation is not peripheral; it is a cultural change; an institutional activity” (Halbert, 2012). Further, for DP to be successful it needs to be included in strategic planning and allocated funding.

#### *Program versus project*

A common pitfall of all technology initiatives in the library is to think of them as projects instead of programs. “It’s not a project, it’s a program” (Rudersdorf, 2012). Projects have a discrete beginning and ending, implying a lack of long-term commitment. While the technology may change rapidly, and staff turn-over is inevitable, DP is a long-term commitment. There needs to be recognition that DP is “an outcome of the organization’s successful day-to-day management of its digital assets” at the outset (Fiffe *et al.*, 2005). There are a few externally-driven arguments for DP that might resound with administrators. The following have been shown to carry more weight than arguments grounded in librarianship ideology, such as ensuring institutional memory or providing a public good.

#### *NSF Data Management Plan*

The first national grant funding agency to require data preservation was the National Science Foundation (NSF). In February of 2011, the NSF implemented a requirement for all grant proposals to include a data management plan. Within the plan, both metadata and preservation must be addressed (National Science Foundation, 2011). Since then, the Digital Humanities Division of the National Endowment for the Humanities also began requiring a data management plan that includes preservation (National Endowment for the Humanities, 2013). While the National Institute of Health has required data sharing for large grants since 2003, and it does require data documentation and archiving, this has not necessarily translated into preservation at the institutional level (National Institutes of Health, 2003).

As most data is now borne digital, these requirements are a natural motivator for a DP program. Collaborating with the librarian who assists with data management plans is a good first step to unifying these activities. Although “The hard scientists had been regularly contributing their papers and publications to discipline-specific digital archives for years [they are] now facing a mandate from granting organizations to contribute their research data to repositories and have sustainable data management plan” (Colati and Colati, 2011, p. 166). If this is an activity that the library has not yet undertaken, a DP program would allow the library to support this

effort. As well, this can be the basis for collaboration with the grant management office and a very substantial service for the scientists and science educators.

### *Legislation*

Recent changes in local legislation may also provide an argument for elevating DP status in the library. In Illinois, Senator Biss has sponsored a bill called the Open Access to Research Articles Act. This bill would require that, among other things, all faculty at public institutions must provide:

- long-term preservation of, and free public access to, published research articles:
- (A) in a stable digital repository maintained by the employing institution; or
  - (B) if consistent with the purposes of the employing agency, in any repository meeting conditions determined favorable by the employing institution, including free public access, interoperability, and long-term preservation. (Illinois General Assembly, 2013, pp. 3-4)

At the writing of this manuscript, the bill has passed both houses and been sent to the Governor for approval. If it becomes law, then each public institution will be required to appoint a task force in order to address the requirements. This is an ideal opportunity for library administration and DP advocates to take part in the conversation and promote DP standards.

### *Disaster recovery*

It is easy to not think beyond the need for access, but what happens when files get corrupted or the server becomes obsolete? DP can easily be forgotten until a crisis emerges (Waters, 2002). When speaking to administrators, using the disaster recovery (or risk management) approach may be a good option. Although the term 'disaster recovery' brings natural disasters to mind, about 40% of digital data loss is due to hardware failure, 29% human error, and 13% software corruption (Smith, 2003). Certainly, any digital material loss could be colloquially termed a 'disaster', depending on the importance of the digital material, how much it would cost to recover it, and if it is recoverable at all. Without a digital inventory, it is difficult to know if file loss is a true disaster or not - after all, the loss may or may not be important. For important digital material, the cost of recovery in the US is estimated at 18.2 billion per year (Smith, 2003). In order for a library to avoid a disaster, and thus manage this potentially expensive risk, a DP program needs to be implemented. This will ensure that important files are safe and recoverable. For administrators, risk management and disaster recovery may be a relatable argument for DP.

### **Collaboration**



Like many small and mid-sized institutions, Milner Library has no DP staff. Milner has a preservation department with four personnel and several other departments that collect or create unique local digital materials. While an inventory of these materials has yet to be completed, it is assumed that the volume is likely to be fairly large. The Digital Collections department consists of four personnel and focuses on creating an array of unique collections for teaching and research. This requires digitally transforming analog material according to accepted standards (including copyright concerns), creating metadata, and administering collections of nearly 40,000 items. The Archives department is run by two personnel and has been given an estimated seven terabytes of digital material. The Digital and Data Services Department consists of two personnel and recently launched an institutional repository. To complicate the organizational infrastructure, the Digital Collections and Digital and Data Services Departments are in a different unit than Preservation and Archives (Figure 1). Rather than rely on a reorganization to facilitate DP, the heads of these departments have opted for informal discussions, presentations, and joint training ventures. At the time of this article publication, it is not known where digital preservation will occur, but it is agreed that it will occur. The first opportunity for collaboration is within the library.

*[Insert Figure 1 here]*

With respect to the entire library, three of eleven departments (27%) are already staunch DP advocates (Figure 1). Another five departments (45%) have some stake in DP and need assistance in understanding how DP affects them. These departments are targeted for awareness and inclusion in future conversations. By cultivating cross-departmental alliances, we intend to demonstrate that DP is a concern for our library as a whole.

Forming a community of support is key to meeting the challenges of DP. “You can’t do it on your own” (Bishoff, 2012). This involves understanding and raising awareness within the library, educating and demonstrating competency to campus stakeholders, and ultimately, leveraging limited resources to foster multiple collaborations. “Digital preservation cannot be left to a small team of specialists within an organization; it needs to be embedded within an organization” (Jones, 2005, p. 99). There needs to be a marriage of the technology-savvy and preservation-savvy advocates in order to elucidate a fundamental “framework of basic concepts” to support DP (Verheul, 2006, p. 268). “It is not about technology, it is about people” (Bishoff, 2012). Forging these partnerships is difficult, but necessary (Stewart, 2012). Creating cross-organizational collaborations is not easy, as some will be wary of sharing resources, desire greater authority over decisions, or have legitimate concerns about privacy and regulatory requirements (Stewart, 2012).

An excellent argument for collaboration is that most technology is more cost effective when it can be scaled up. That is, funding can be pooled to stretch further. Kolowich (2012, para. 15) observed that “we’re either going to solve this problem institution by institution at great expense and with little chance of solutions that last...[or] solve it together at scale, just like we

did with high-performance networks.” Therefore, it is important to build collaborations at all levels; library, campus, consortium and nationally.

### *Balancing print and digital*

Small institutions have limited staff and time for the preservation of all collections within the library. Moving traditional preservation staff into caring for digital collections can be confusing and frustrating as new workflows and focus require new skills and thought processes.

Preservation of paper and book materials is based on techniques that slow the natural decay by controlling the environmental temperature, humidity, and chemical makeup of the items in the collections. With book and paper materials, print copies and surrogates only happen when the original is too fragile to be handled safely. With proper storage conditions, items can be housed safely and don't require constant maintenance and testing. Fixing it and putting it back on the shelf takes care of a majority of the print collection.

How is this different from DP? The DP concept of producing many copies and checking for bit rot regularly creates a need for a different awareness and plan within a preservation department. Balancing the preservation needs of the physical collection, which fills a conservation lab's shelves, and the unseen digital data, which is out-of-sight in the digital world, requires the preservation staff to rethink how they use their time and resources. All this requires “better coordination among the various parties involved in digital preservation; and the development of tools for appraisal and risk assessment” (Hedstrom and Montgomery, 1998, p. 22).

Integrating the DP workflow into the existing preservation organization involves staff and departments that do not usually coordinate with the preservation department. Unlike traditional preservation, “digital preservation, would permeate all organizations and institutions, including many who did not regard themselves as playing a digital preservation role and who may initially have regarded digital materials as fairly peripheral to their needs” (Jones, 2005, p. 96). Especially with the need for balancing priorities, the importance of collaborating with the preservation department cannot be underestimated.

### *Common language*

When it comes to DP, a common language is just as important as clearly defined processes and objectives. “Agree on vocabulary – especially with IT” (Bishoff, 2012). As noted above, ‘backup’ is a common term for computer technologists and programmers. To equate backup to DP is erroneous, but due to the familiarity of this concept, it may be a good place to begin the conversation.

Ironically, it is using the same words, but assuming subtly different meanings, that is often the crux of miscommunications. Indeed, several groups on campus may be experimenting with some aspects of DP, but may not be using the same terminology, or have the expertise, that exists in the library (Joint, 2007). This may be the case for entities that are in charge of sensitive university data or trying to meet National Science Foundation Data Management Plan

requirements (Smith, 2011). As a result, disparate groups may be duplicating efforts without knowing it. The lack of commonality in the language of DP across campus is a handicap in attaining constructive cross-organizational collaborations.

How can librarians bridge the communication gap that exists between them and other computing experts? It is important to take the time to define terminology and establish trust. This should be a key component of the first inter-departmental conversation; its importance cannot be underrated, particularly if librarians aspire to administering their own DP tools.

### **Next Steps**

It is not uncommon to be overwhelmed when one begins to consider DP. The lack of resources makes meeting national standards an improbability. Combine this with the sheer volume and urgency of the problem and it is tempting to believe that DP is not achievable. Chris Prom of University of Illinois at Urbana-Champaign Archives states “first, do no harm...[and]...don’t try to do everything at once.” Steve Bromage of the Maine Historical Society advises people to “have priorities, not all information and data are collected equally.” Many advocates at small or mid-size institutions are struggling with similar issues. Advocates at Milner Library are approaching DP by raising awareness, taking a comprehensive inventory of digital materials, and participating in grants and training opportunities.

### *Inventory*

After awareness-raising presentations and attending a DP workshop, Milner Library will begin by taking an inventory of the digital files and collections within the library. A practicum student from the School of Library and Information Science at the University of Illinois-Urbana/Champaign will be working with Milner to inventory the file types, size, media, and locations within the building, as well as gathering any metadata available on those files. All Milner faculty and staff will be interviewed with special attention paid to the administration, digitization, archives, and special collections departments. This inventory will help the library organize, evaluate, and prioritize the content for safe keeping. The volume of material will help push the conversation regarding required storage space and workflows. This inventory is essential in deciding “whether to build, buy, or outsource (or some combination of all three) its digital preservation activities. This would require a systematic review and evaluation of the University’s current projects and the ‘preservation-readiness’ of the digital content itself” (Colati and Colati, 2011, p. 171). Once the inventory is performed, it will be beneficial to follow the example of Welch *et al.* (2011, p. 60), who “analyzed its internal user groups - public relations, development, and central administration - and recast its collections to appeal to their unique needs.”

### *Participate*

Milner Library also participates in the Institute of Museum and Library Services (IMLS) sponsored National Leadership Grant to investigate multiple collaborative and scalable DP

solutions and evaluate them for small and medium-sized college and university libraries. The initiative gathers the expertise of an advisory group from across the United States and partner institutions across the State of Illinois. Within the course of implementing the project, a selection of DP tools will be tested by each of the partners. The testing and documentation of this are reported regularly at <http://digitalpowrr.niu.edu/>.

Although the final output of this project is the publication of a white paper, there are several additional incentives to participate. The first is that piloting DP solutions may gain organizational buy-in with institutional decision makers. It may also empower the ‘front lines’, via hands-on experience with DP solutions that are custom chosen for their needs. It provides legitimacy to the claim DP advocates make, that it is necessary for accessing information for future use and that it should be prioritized. Although Milner advocates have had the honor of participating in this particular grant, joining any type of local coalition sends a message to colleagues and administration that DP is important.

This effort complements the Train-the-Trainer workshop sessions developed and taught by the Library of Congress Digital Preservation Outreach and Education (DPOE). The Consortium of Academic and Research Libraries in Illinois (CARLI) sponsored a DPOE workshop in July 2013. Two of the authors of this paper were able to attend. There is hope that this “increased visibility at a local level supported by national organizations will finally make it possible for all of the talk to become reality” (Molinaro, 2010, p. 47).

### *Planning*

Nancy McGovern, noted digital preservation pioneer, has referenced the idea of the three-legged stool of digital preservation. It consists of organizational infrastructure, technological infrastructure, and a resources framework (Library of Congress, n.d., Nancy McGovern). Milner Library DP advocates are building the three legs of that stool with the IMLS POWRR grant, the digital materials inventory, DPOE training, and cross-departmental collaboration (Figure 2). In addition, discussions have begun regarding the short-term hire of a Visiting Librarian to create a customized DP plan (Figure 3). This position would be advised by various Milner Library stakeholders and would be focused on bridging the gap between what is ideal and what is possible. This position would ensure that progress would continue without further burdening existing staff. As well, it is not a long-term financial commitment, making it more appealing to administration.

*[insert Figure 2]*

*[insert Figure 3]*

### **Conclusion**

It is difficult to provide an exact map for every institution to take on its path to establishing DP. This is particularly true for resource restricted institutions, where the first barrier is the acceptance that DP can and should be done. However, there are several approaches

that can be explored. Certainly, training on the practice and importance of DP is essential. Training dispels DP myths and develops a common language. As well, articulating the human challenges is also important. Without recognition, there can be no resolution. Some typical challenges are: minimal funds, change fatigue, lack of training, lack of engagement and lack of recognition from decision makers, etc. Seeking collaborations helps to overcome these challenges, particularly if the collaborations are regional or multi-institutional. Milner Library DP advocates have found that dispelling DP myths, developing a common language, and articulating the human challenges have brought people together and created an environment where a short-term DP position can be discussed. This required that department heads pursue training, allocate what small resources they have to DP activities, and most importantly, collaborate and communicate. No one staff member has the resources to implement DP, but together, the group is moving the process forward. No matter the challenges, DP advocates can go from overwhelmed to taking action if they seek out and take advantage of every opportunity they can.

## References

- Becker, D. and Riley, J. (2010), "Seeing Standards: A Visualization of the Metadata Universe", in K Börner & M. Stamper (eds), *7th Iteration (2011): Science Maps as Visual Interfaces to Digital Libraries*, Places & Spaces: Mapping Science, available at: <http://scimaps.org>.
- Bishoff, L. (2012), personal communication, October 16.
- Boyd, M. (September 2001), "ISU History: A Tribute to Perseverance, The Construction of Milner Library at Illinois State University", available at: <http://library.illinoisstate.edu/unique-collections/history-digital/ISU-history/online/milner.php> (accessed June 13, 2013).
- Bromage, S. (2012), personal communication, October 15.
- Consortium of Academic and Research Libraries in Illinois (2010), "CARLI and digital preservation: A white paper", working paper 7, Digital Collections Users' Group, 1 March.
- Colati, J.B. & Colati, G.C. (2011), "Road tripping down the digital preservation highway, part II: Road signs, billboards, and rest stops along the way" *Journal of Electronic Resources Librarianship*, Vol. 23 No. 2, pp. 165-173.
- Digital Preservation Outreach & Preservation (2013), "DPOE Train-the-Trainer Workshops", available at: <http://www.digitalpreservation.gov/education/ttt.html> (accessed April 7, 2013).
- Duff, W.M., Limkilde, C. and van Ballegooie, M. (2006), "Digital preservation education: educating or networking?" *The American Archivist*, Vol. 69, pp. 188-212.
- Fyffe, R., Ludwig, D. and Warner B.F. (2005), "Digital preservation in action: Towards a campus-wide program", *ECAR Research Bulletin*, Vol. 2005 No. 19, pp. 2-14.
- Greenfieldboyce, N. (2009), "Houston, we erased the Apollo 11 tapes", NPR, July 16, available at: <http://www.npr.org/templates/story/story.php?storyId=106637066> (accessed June 21, 2013).
- Halbert, M. (2012), personal communication, October 16.
- Harvey, R. (2005), *Preserving digital materials*, Mörlenbach, Germany, Strauss GmbH.

- Hedstrom, M. (1998), "Digital preservation: A time bomb for digital libraries", *Computers and the Humanities*, Vol. 31, pp. 189–202.
- Hedstrom, M. and Montgomery, S. (1998), "Digital preservation needs and requirements in RLG member institutions", working paper, Research Library Group, Mountain View, CA, December.
- Illinois General Assembly (2013), Open Access to Research Articles Act, Bill SB1900, available at: <http://www.ilga.gov/legislation/98/SB/09800SB1900.htm>
- Jantz, R.C. (2012), "Innovation in academic libraries: An analysis of university librarians' perspectives", *Library & Information Science Research*, Vol. 34 No. 1, pp. 3-12.
- Joint, N. (2007), "Data preservation, the new science and the practitioner librarian", *Library Review*, Vol. 56 No. 6, pp. 450-455.
- Jones, M. (2006), "The Digital Preservation Coalition: Building a national infrastructure for preserving digital resources in the UK", *The Serials Librarian*, Vol. 49 No. 3, pp.95-104.
- Kolowich, S. (2012), "Giving digital preservation a backbone", available at: <http://www.insidehighered.com/news/2012/11/09/educause-call-digital-preservation-will-outlast-individual-institutions-and> (accessed June 1, 2013).
- Library of Congress (n.d.), "Nancy McGovern: Digital Preservation Pioneer", available at: <http://www.digitalpreservation.gov/series/pioneers/mcgovern.html> (accessed July 29, 2013).
- Library of Congress (n.d.), "NDSA Standards and Practices Working Group", available at: [http://www.digitalpreservation.gov/ndsa/working\\_groups/standards.html](http://www.digitalpreservation.gov/ndsa/working_groups/standards.html) (accessed 13 June 2013).
- McDonough, J. (2012), personal communication, October 15.
- Meddings, C. (2011), "Digital preservation: The library perspective", *The Serials Librarian*, Vol. 60, pp. 55-60.
- McGath, G. (2011), "Choosing your media", available at: <http://filesthatlast.com/2011/12/13/media/> (accessed May 12, 2013).

- Molinaro, M. (2010), "How do you know what you don't know? Digital Preservation Education" *Information Standards Quarterly*, Vol. 22 No. 2, pp. 45-47.
- National Endowment for the Humanities (2013), "Data Management Plans for NEH Office of Digital Humanities" available at:  
[http://www.neh.gov/files/grants/data\\_management\\_plans\\_2013.pdf](http://www.neh.gov/files/grants/data_management_plans_2013.pdf) (accessed June 21, 2013).
- National Institutes of Health (2003), "NIH Data Sharing Policy and Implementation Guidance", available at:  
[http://grants.nih.gov/grants/policy/data\\_sharing/data\\_sharing\\_guidance.htm#archive](http://grants.nih.gov/grants/policy/data_sharing/data_sharing_guidance.htm#archive) (accessed 21 June 2013).
- National Science Foundation (2011), Chapter II, Proposal Preparation Instructions, available at:  
[http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg\\_2.jsp#IIC2j](http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_2.jsp#IIC2j) (accessed June 21, 2013).
- POWRR (2012), "Preserving (Digital) Object With Restricted Resources", available at:  
<http://digitalpowrr.niu.edu/> (accessed June 24, 2012).
- Prom, C. (2012), personal communication, October 15.
- Puglia, S., Reed, J., and Rhodes, E. (2004), Technical Guidelines for Digitizing Archival Materials for Electronic Access: Creation of Production Master Files – Raster Images, available at: <http://www.archives.gov/research/arc/techguide-raster-june2004.pdf> (accessed June 13, 2013).
- Rudersdorf, A.E. (2012), personal communication, October 15.
- Smith, D. (2003), "The cost of lost data", *Graziadio Business Review*, Vol. 6, No. 3. Available at: <http://gbr.pepperdine.edu/2010/08/the-cost-of-lost-data/> (accessed 21 June 2013).
- Smith, P.L. (2011), "Developing small worlds of e-science: using quantum mechanics, biological science, and oceanography for education and outreach strategies for engaging research communities within a university", *The Grey Journal*, Vol. 7 No 3, pp. 121-126.
- Stewart, C. (2012), "Preservation and access in an age of e-science and electronic records: sharing the problem and discovering common solutions", *Journal of Library Administration*, Vol. 52 No 3-4, pp. 265-278.



Verheul, I. (2006), *Networking for digital preservation: Current practices in 15 national libraries*, München, K.G. Saur.

Waters, D. (2002), "Good Archives Make Good Scholars: Reflections on Recent Steps Toward the Archiving of Digital Information", in *The State of Digital Preservation: An International Perspective*. Washington, D.C.: Council on Library and Information Resources, pp. 78-95.

Welch, J.M., Hoffius, M.S., and Fox, E. B. (Jan 2011), "Archives, accessibility, and advocacy: A case study of strategies for creating and maintaining relevance", *Journal for Medical Library Association* Vol. 99 No. 1, pp. 57-60.

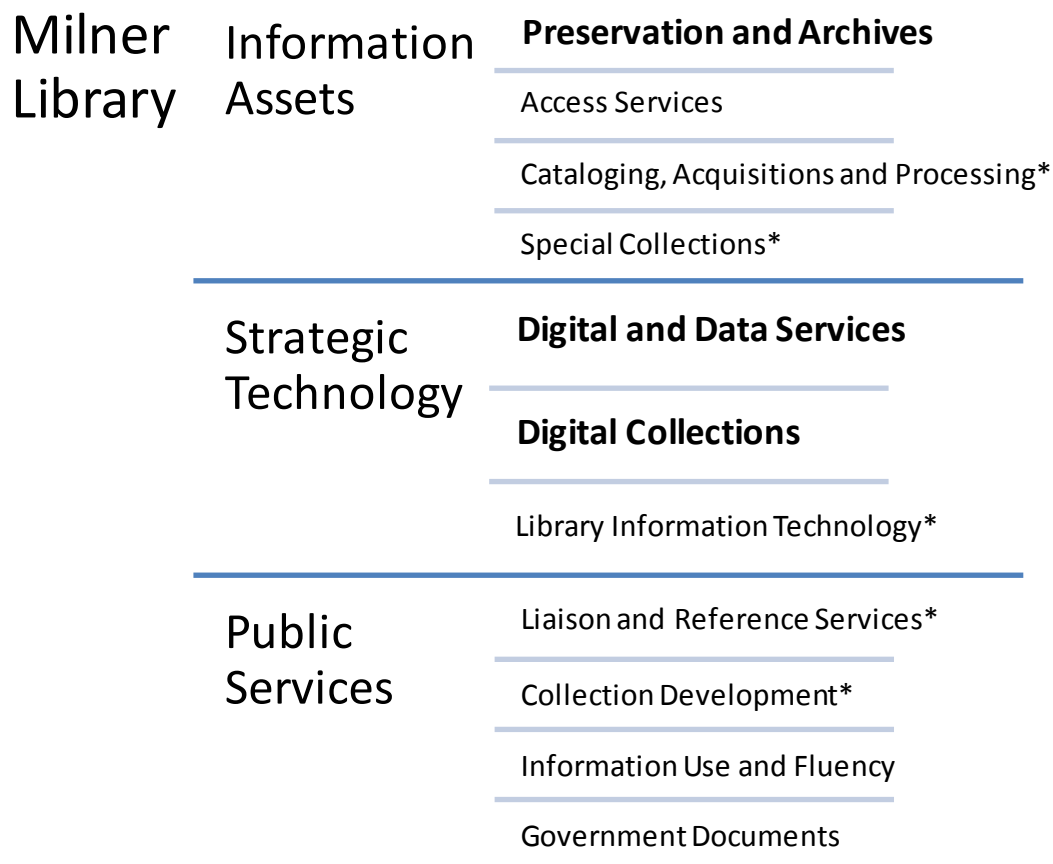


Figure 1. Milner Library’s organizational infrastructure and digital preservation advocates. Departments in bold are staunch digital preservation advocates and those with asterisks are likely converts.

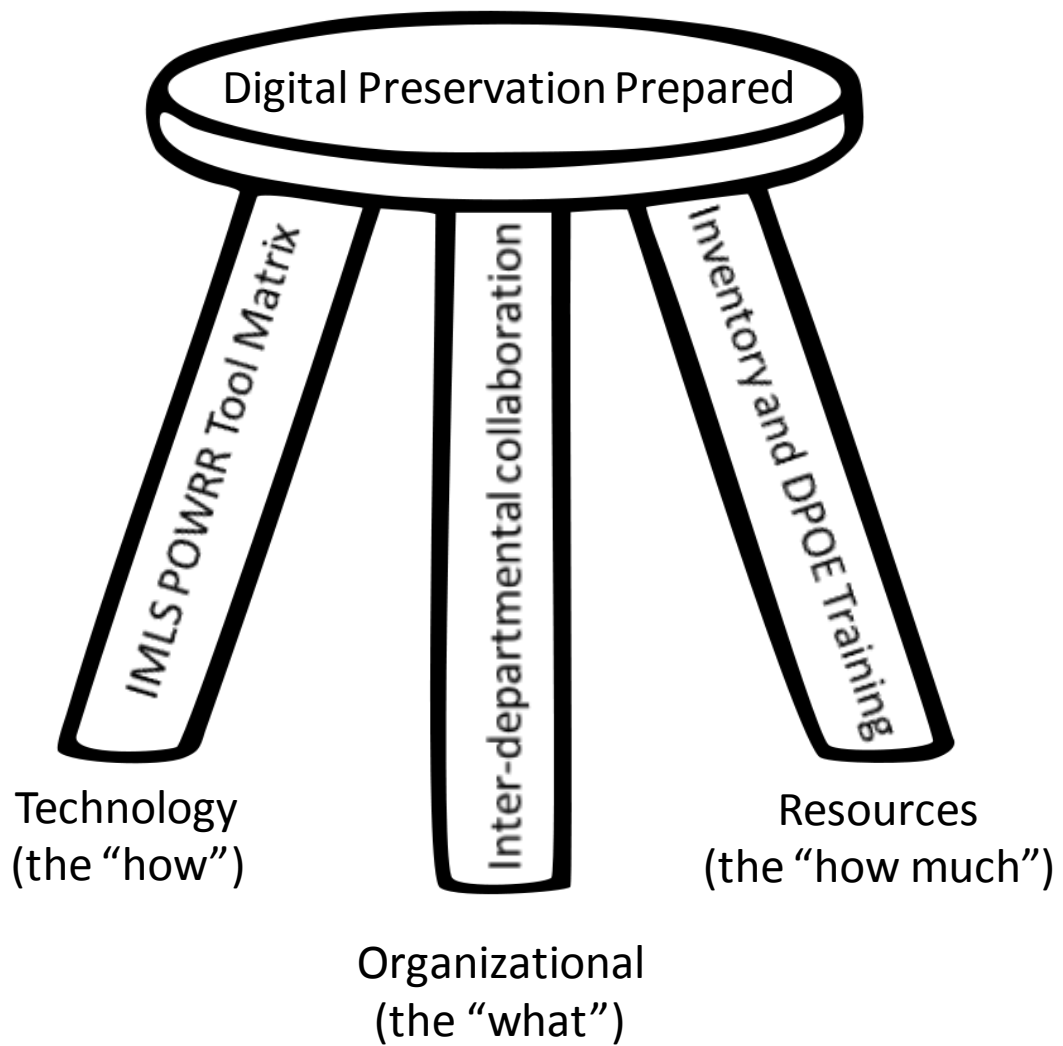


Figure 2. Milner Library digital preservation advocates building of Nancy McGovern's three-legged stool.

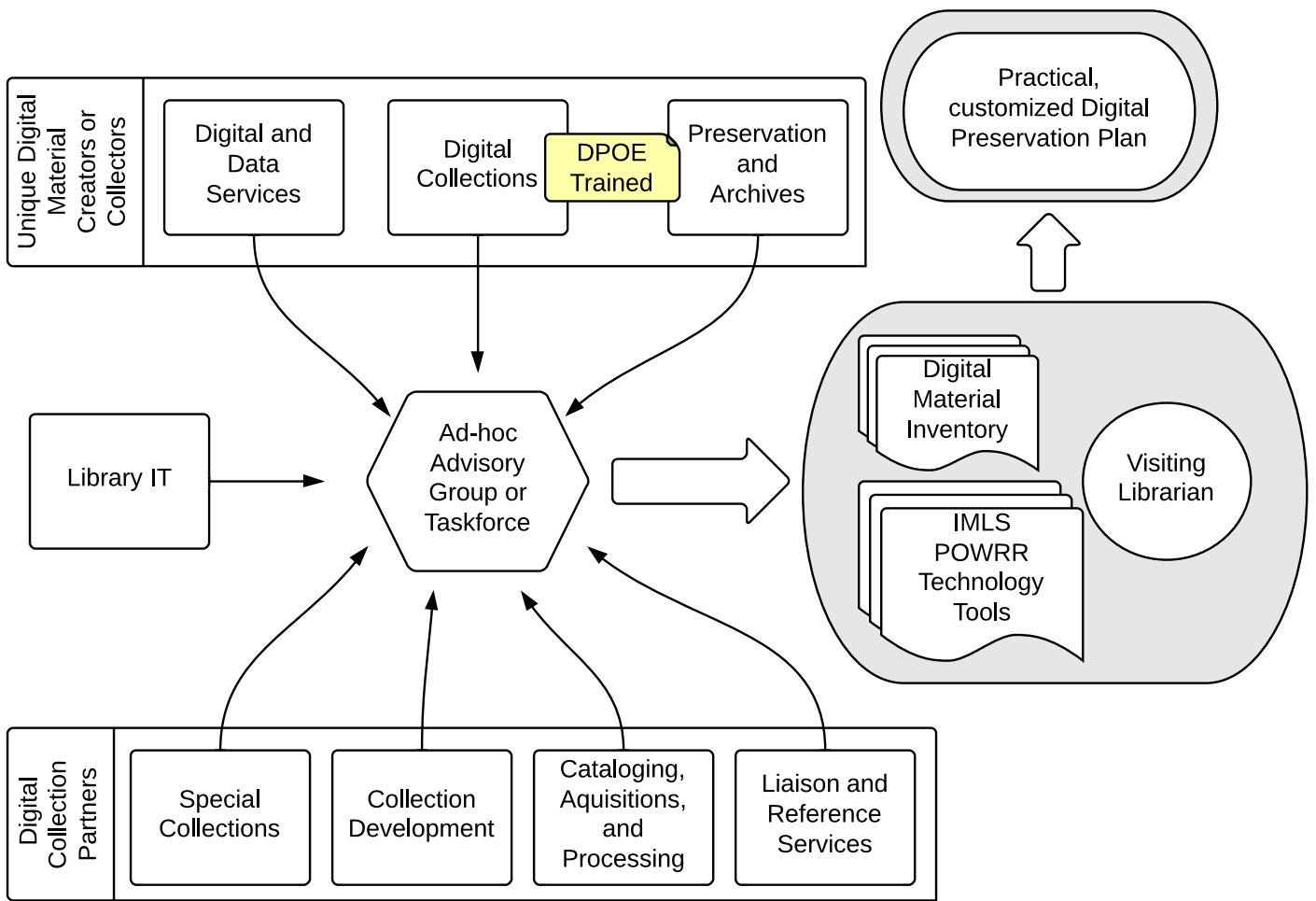


Figure 3. Proposed personnel workflow for determining a practical, customized digital preservation plan.

## **Acknowledgments**

The authors would like to gratefully acknowledge the POWRR board of advisors, Liz Bishoff, Steve Bromage, Martin Halbert, Jerry McDonough, Chris Prom, and Amy E. Rudersdorf; Lynne Thomas and Drew VandeCreek, Principal Investigators, Northern Illinois University; and Teresa Mitchell for her copy editing services and assistance with manuscript preparation.

## **Biographical Details**

Amanda K Rinehart is Head of Data and Digital Services at Milner Library, Illinois State University, Normal, USA. She is a representative of Illinois State University for the IMLS National Leadership grant, Preserving (Digital) Objects With Restricted Resources (POWRR) -- a collaboration with other Illinois academic institutions to evaluate suitable digital preservation solutions for small and medium-sized college and university libraries.

Patrice-Andre Prud'homme is Head of Digital Collections at Milner Library, Illinois State University, Normal, USA and also a PhD student in the College of Education, Higher Education Administration. He is the project lead for Illinois State University in the IMLS National Leadership grant, Preserving (Digital) Objects With Restricted Resources (POWRR) -- a partnership with other Illinois academic institutions led by Northern Illinois University in a collaborative effort to evaluate suitable digital preservation solutions for small and medium-sized college and university libraries.

Andrew Huot is the Conservator and Preservation Specialist at Milner Library, Illinois State University, Normal, IL, USA. He also teaches Conservation, Preservation, and Bookbinding for the School of Library and Information Science at the University of Illinois – Urbana/Champaign.