Collections Understanding and the IMLS Digital Collection Registry

Introduction

In the fall of 2002 the University of Illinois at Urbana-Champaign (UIUC) received a grant from the Institute of Museum and Library Services (IMLS) to implement a collection registry and item-level metadata repository for digital collections and content created by projects funded under the IMLS National Leadership Grant Program (NLG). The genesis and rational for the IMLS DCC project has been described in detail in previous papers (Cole and Shreeves, 2004). Citing the IMLS DCC project, Donald Waters expressed concern in his 2004 Webwise keynote address that the IMLS NLG projects "rarely build on, enhance, or otherwise connect with work across institutions....And I fear that this is a problem that cannot be addressed simply by building collection registries that will make it possible for users to build ad hoc connections as the need arises." Waters also expressed concern that projects make "a huge recurring mistake" by failing to include users in the design and development of their projects. To better address Water's concern, this paper explores the development of collection-level metadata from the point of view of practitioners in comparison to what we know about the information-seeking behavior of humanities scholars who are one community that will benefit from a completed IMLS Digital Collection Registry and item-level metadata repository. This paper combines a review of other information-seeking behavior studies with a series of usability studies using a small sample of humanities researchers.

The previous studies included in this review specifically focus on two groups.

Literature published by cultural heritage practitioners developing aggregated metadata resources, often through the Open Archives Initiative – Protocol for Metadata Harvesting (OAI-PMH), and studies by LIS researchers into the information-seeking behavior of humanities scholars across several disciplines. Because many of these studies have glossed over the role that collections play in information-seeking behavior, a series of usability studies was conducted using the IMLS Digital Collection Registry to highlight the ways humanities scholars apply collections understanding to an collection registry.

Collections understanding: The practitioner view

The IMLS DCC immediately faced the challenge of defining what a collection was in the context of IMLS NLG projects. Initially collections-level descriptions were to be modeled after item-level content created for a specific NLG project, however it was quickly realized that "the digital collection created as a result of these activities is an important, but not fundamental end result of the project." (Cole and Shreeves, 2004). Finding that the definition of collection across the cultural heritage community ran a "wide gamut," the project turned to the groundbreaking work of the UK's Research Library Support Program (RSLP) Collection Description Schema and subsequent Dublin Core Collections Description Application Profile based on RSLP-CD. The model for the RSLP schema was proposed by Michael Heaney and focused on "unitary finding aids" that describe a collection as a whole, not as a hierarchy of collection items (such as found in Encoded Archival Description finding aids). Heaney's model took a broad view that a collection was "any aggregation of individual items" that may be based on any criteria, transient, impermanent and distributed across multiple physical locations (Johnson and

Robinson, 2002). The IMLS DCC project considered Heaney's broad model and modified it for the IMLS Digital Collection registry to include any group of items that were "cohesive; searchable as a distinct collection; and available through a unique entry point." (Cole and Shreeves, 2004).

The development of collections-level metadata for aggregated resources is derived from professional understandings of what collections are. Heaney's model for collections description explicitly notes that "the model is aimed in the first instance at those responsible for the development of collections descriptions" which it is hoped will "illuminate the process of resource discovery by users. It is hoped that collections-level descriptions will enhance the user's ability to "discover and locate collections of interest," perform searches across multiple collections in a defined way, and allow software to assist users to perform these functions. (Powell, Heaney and Dempsey, 2000). Likewise Lagoze and Fielding's work on building "collections services" for digital libraries is also built on "traditions well established in the library community, where collection development serves three important roles.... Selection, Specialization and Administration….From the standpoint of user visibility, selection dominates these roles; the quality and usefulness of a library is generally determined by the resources available from it" (Lagoze and Fielding, 1998). Professional concerns about preservation and control of collections also informs the resources available to developers of digital cultural heritage content, such as the *Framework of Guidance for Building Good Digital Collections*. While the *Framework* and the publications it cites do consider the user, it is often concerned about *what* the user uses, rather than *how* the user uses them.

For the developers of aggregated cultural heritage content, the library-centered definitions are made even more heterogeneous by inclusion of museum and archival collections. Museum collections may include the entire holdings of a single institution, which are often subdivided into sub-collections based on format (i.e. oil paintings, prints, decorative arts, etc.). (Dunn, 2000). The archival community has developed traditions of collections description through the development of the MARC Archival Materials Control (MARC AMC) format and "hierarchical collections-description" in the form of Encoded Archival Description and traditional finding aids. These descriptions are closely tied to the provenance of group of materials, reflecting the arrangement and collocation of materials by their original collectors. While the understanding of collections in these communities sometimes differ from those of the library community, they share a common focus on professional practice, rather than an understanding of user needs and how researchers use collections.

Collections understanding: Humanities Scholars.

While professional understanding of what collections are is an obvious starting point for the development of collections-level metadata schemas, it is also helpful to consider how these schemas relate to the user's understanding of collections. Hur-Li Lee's work has been useful in pointing out that professional understandings of collections do not necessarily translate into user understanding of collections (Lee, 2000; Lee 2005). While Lee's work has primarily focused on more traditional library collections (as opposed to specialized cultural heritage collections), even for these materials "….the library collection seemed to be extremely vague in the user's minds….The librarian's perspective was that of

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management, and its emphasis was on control. The users' perspective was one of access, and its emphasis was on personal convenience and flexibility" (Lee, 2005).

Unfortunately our best sources on understanding the role that collections play in the information-seeking behavior of users has overlooked the "dynamic interaction between user and collection" (Lee, 2005). While further research is needed to directly connect the role that collections and collections-level metadata may play in user behavior, existing research is suggestive of how a collection registry may lead users to the resources they need. The studies included here have included a broad range of humanities scholars working both within a specific discipline and across multiple disciplines. Because the archival community has been particularly interested in increasing access to collections, historians are one group well represented in the literature.

The available studies appear to support Lee's contention that users lack a solid understanding of professional practice when it comes to defining a collection. Participating researchers often understood collections as groups of material housed in a specific physical location, sometimes the location and nature of collections is defined by the format (e.g. bibliographic collections, archival materials, museum artifacts, etc.) and often by the subject of collected material. (Lee, 2005; Yakel, 2002; Yakel and Torres, 2003).

Humanities researchers used a variety of methods to identify sources of collections that were related to their research. Despite the effort that has been placed on creating collection-level descriptions for archival collections (both through the MARC AMC format and Encoded Archival Description and online finding aids), humanities researchers more often relied on citation chaining and advice from colleagues. While resources such as the

National Union Catalog of Manuscript Collections and RLG's RLIN database were often mentioned, researchers also commented that these resources were less frequently used because they were out of date or lacked sufficient information to identify collections related to their research topic. Use of online resources has increased since the first studies were conducted, however even recent studies indicate that print resources and individual connections are more frequently used. This has lead several authors to encourage additional user education and marketing of online resources (Buchanan, Cunningham, Blandord, Rimmer and Warwick, 2005; Palmer and Neuman, 2002; Tibbo, 2002; Tibbo 2003; Yakel, 2003; Southwell, 2003; Steig, 1981; Wiberly 1991; Wiberly 2002).   Recent studies also show that scholars routinely use the Internet to conduct both discovery and confirmation searchers. However, it is unclear whether these searches apply to both collections and individual items (Brockman, William S.; Neumann, Laura; Palmer, Carole; Tidline, Tonyia J., 2001; Palmer, 2005).

Researchers demonstrated a lack of understanding of professional practice and terminology used to describe collections. This is particularly evident in archival users' understanding of hierarchical finding-aids. Users were frequently confused by the terminology used by archivists and the practice of organizing collections within finding-aids. Researchers noted that they were confused by professional descriptions and organizations of collections found in finding aids or other collection-level descriptions. This confusion inhibited their ability to identify appropriate items and encouraged browsing behavior in order to locate relevant items. (Malbin, 1998; Southwell, 2003; Tibbo, 2002; Tibbo, 2003; Yakel, 2003).

Once scholars have identified a collection of interest they employed a variety of techniques to identify items that were relevant to their research activities. Their behavior is often iterative and requires frequently reformulation of search strategies as information is gleaned from new resources. This behavior emulates the berry-picking approach proposed by Bates, as the search strategies of scholars evolve as their research evolves. Researchers rely heavily on searches based on personal and corporate names, often limited by the context of geographic locations and chronological time periods. (Bates, 1996; Case, 1991; Palmer and Neuman, 2002; Wiberly, 1991; Wiberly 2002)

Humanities scholars relied heavily on context to discern meaning from the items found within collections. Provenance of collections and collocated items can be important in establishing the context of resources. Context and relationships can also provide opportunities to make comparisons with related items and also facilitates further searching, both *within* and *across* collections. Within a collection of materials, context may provide significant clues about the importance of a particular item. Understanding the context may lead scholars to "make connections that you wouldn't make normally through databases...[or] through any kind of purposive search." (Brockman, Neumann, Palmer, Tidline, 2001). Browsing behavior was also important for scholars trying to establish a map of the collection landscape that could not be provided by hierarchical finding aids in archival collections. Historians were particularly interested in the ability to browse by genre (such as court documents, case files, type of artwork, etc.) Historians and interdisciplinary scholars also appreciated the ability to browse across traditional academic disciplines and subject classification schemes to find materials related to their study.

(Case, 1991; Duff and Johnson, 2002; Palmer and Neuman, 2002).

Providing context appears to be an important role for collections-level metadata, particularly for aggregated item-level metadata that has been removed from its original context. Research using metadata harvested from Committee for Institutional Cooperation (CIC) indicates that linking item-level and collection-level metadata can produce higher retrieval rates for item-level descriptions. As collections-level metadata may include key access points lacking in item-level metadata, orphaned items can be re-contextualized using this approach. Because collections descriptions are available from item-level records, the CIC portal also facilitates browsing behavior familiar to humanities scholars. (Foulonneau, Cole, Habing and Shreeves, 2005).

Methodology

For this study face-to-face usability tests were conducted with University faculty and staff. Although recruitment efforts included multiple humanities disciplines the final set included three full professors from the department of history, an art librarian and a museum collection manager.

The five participants were invited to interact with the IMLS Digital Collection Registry during thirty-minute sessions.   No specific tasks were initially assigned to participants, and most were able to define their own tasks based on research questions that they commonly engaged in during the course of their regular research activities. If a participant had difficulty developing a task, the interviewer suggested tasks based on their initial free-form interaction and comments to the IMLS Digital Collection Registry. Participants were also asked about their understanding of collections and what role

collections played in their normal research activities. Participant interaction with the IMLS DCR was recorded in real-time along with "think-out-loud" techniques.

Testing was accomplished on a laptop and user interaction and audio commentary was captured using SnapZ Pro. Initial testing was planned to take place in participants offices, however, it difficulties with acquiring reliable network access necessitated the majority of interviews taking place at the Graduate School of Library and Information Science (GSLIS) and Grainger Engineering Library offices. Some user confusion did result from unfamiliarity with Apple operating system, and it is recommended that OS X specific features be disabled during future testing. Providing a mouse during testing was also an important way to reduce user anxiety about using an unfamiliar computer.

Initial Impressions of the Collections Registry

For participants, their initial interaction with the IMLS Digital Collection Registry was not only about orienting themselves to the interface, but to the DCR as a collection of resources itself. All users expressed uncertainty about whether the IMLS DCR was a collection of items or a set of collection descriptions. Only through interaction with the features of the site was it made clear that the Digital Collections Registry included only collections-level descriptions that lead to items through individual collection web sites.

With the exception of one user, participants immediately gravitated towards the *Browse By* features offered as the first choice in the DCR home page. Because the introductory text and page header provided little information that was useful to participants, the *Browse* feature was an important method for users to begin mapping the scope of what was available through the DCR. As one user commented "For my research

purposes this is going to be a problem right away. I'm really interested in larger databases that purport to say that we have everything between this year and this year." Because few participants were familiar with IMLS or the National Leadership Grant Program information in the header provided little indication of the types of collections that would be available in the DCR. The one outlying user was also seeking the same information, but chose the *About* link first in order to learn what was included.

Each user chose a different entry point from the *Browse By* menu. Several users chose to enter through *Subject* or *Object* because they believed it would lead directly to items of interest. One participant chose to enter through *Titles* because they believed this choice would "show me what's here." Participants rarely began using the search feature until after they had engaged in significant browsing and expressed that they now had developed a sense of what types of searches might be effective within the DCR.

Navigating within the Digital Collections Registry

The importance of contextual information provided by the interface also was indicated in participant comments when navigating within the DCR. Participants noted the usefulness of the faceted listings under *Subject* and *Object* in defining the scope of collections found in the DCR. One user commented on that the inclusion of the number of collections under each facet was especially helpful. "Whenever I see a subject heading with only a couple of entries, I'm going to guess it's not worth my time...I'm much more interested in having the most comprehensive collection I can."

Participants often commented about the amount of scrolling required to view all of the descriptions available and expressed that they were sometimes overwhelmed by the

quantity of information provided on a single screen. One one hand, the detailed facets were important for users to establish the scope of the collections, while at the same time not having all of the possible choices appear on the first view led participants to comment on having to scroll to see their area of interest (since most participants were historians, their area of interest fell under *Social Studies*, which appeared "below the fold" and required scrolling before they could see it.) Because *Social Studies* and *United States History* is one of the largest subject categories found in the IMLS DCR, participants also commented that it would be helpful if this category was further broken down into specific areas of U.S. History, instead of the current long list of undifferentiated titles and descriptions. One user suggested that "*Social Studies* might be too broad a topic, because it encompasses so much." Likewise, the participant who chose *Titles* as their entry point was confronted with a long list of all IMLS DCR projects. While this did not elicit any comments from them, their browsing behavior was concentrated to collections that appeared at the top of the list.

The use of the GEM subject headings as the primary subject access point was a conscious decision on behalf of the project, primarily aimed at the K-12 audience. If the Registry were to be marketed to this audience consideration should be given to providing a subject gateway more suitable to their expectations.

Few participants took advantage of the *Browse By NLG Project* or *Hosting Institution* links. From participant comments, it appears that they did not notice these choices when initially orienting themselves to the interface. Lack of knowledge about IMLS and the NLG program may also have suggested that these links would not lead them in useful directions. One user who was particularly interested in learning about the scope

of the DCR did not notice this option until after extensive browsing of other areas. After

looking at the list of *Hosting Institutions*, this user commented that "had I seen this earlier

it would have been the first place I went to see the coverage of what's included."

Participants found the descriptions provided with brief records useful in

establishing expectations for what they would discover after selecting *Collection Home*.

Most users appropriately chose *Collection Home* in order to view collections they were

interested in. Participants only used the *Full Description* on occasion (particularly the one

librarian included in the testing).

When participants did begin using the search feature of the DCR, they often began

with the most specific terms they were looking for. Because this often resulted in no

relevant collections, they frequently reformulated their search to broader categories or

returned to browse to find relevant collections. A possible source of this behavior is the

extensive use of Google by all participants. When asked about other tools to find

collections, all participants cited Google as one of their first choices. Most participants

found Google to be a good way to find relevant items that they were previously unaware

of. However, as one participant commented "I use Google a lot, actually, when I have a

real specific question or a specific phrase. Again, I want the most comprehensive thing and

Google's pretty good if I have a specific phrase that's not going to yield 20,000 hits."

Further research is necessary to determine whether the need for specificity in Google

carries over into behavior in other search tools.

Navigating Outside the Digital Collection Registry

While participants had little difficulty navigating within the DCR, their experiences

once they left the DCR were not always as successful. Just as they struggled to understand

the scope of collections provided in the DCR, initial interaction indicated that they did not

immediately understand that the DCR would lead them to outside collections. Several

users commented upon realizing that this was the case, and were able to move between

collections more easily afterwards. Participants in this survey did not appear to recognize

the icon provided next to the *Collection Home* link indicated they would be lead to an

outside resource.

All participants expressed some disappointment at not being lead directly to the

items that were suggested by the collections-level metadata. Many of the links for the

DCR lead to a project's home page that required a subsequent search or browse in order to

find items. Frequently collection home sites did not offer the same type of

searching/browsing offered in the DCR, e.g. the ability to find items based on GEM

subjects or formats of materials.

The majority of their criticisms were leveled at whether individual sites offered an

efficient way to view relevant items in a useful manner. Expressing frustration at one site a

participant commented that there were "too many layers to navigate through." after leaving

the DCR. Comments from participants outside of the DCR echoed Lee's argument that

"The users' perspective was one of access, and its emphasis was on personal convenience

and flexibility" (Lee, 2005) . Participants commented on the relative ease (or lack thereof)

that individual sites afforded for them to include the materials they found in classroom

presentations, more in-depth research, or the ability to include materials in personal note-

taking software (e.g. the ability to cut and paste text). One user commented that "I'd rather

spend more time working with sources rather than finding them."

Participants often commented "how do I get back" after examining a individual collection outside of the DCR. While most realized the browser's *Back* button was the best way to achieve this, they considered it an inefficient and time consuming mechanism, particularly if they had extensively browsed the local site. Local collections interfaces that spawned new browser windows also caused disorientation among participants, causing one participant to close all the windows and have to restart the IMLS DCR and re-enter their search.

As many of these comments from participants lie outside the scope of the IMLS DCR component, they do not necessarily reflect on the usability of the DCR. However, these are useful considerations for the long-term goal of integrating the DCR with item-level metadata. In discussing the project with one user, they commented that having item-level metadata "would be really valuable, just to limit the number of layers." Participants often commented about the efficiency of the other sources they used and suggested the ability to access items from across the collections they saw in the DCR would more closely meet their expectations.

Collections Understanding: Participants View

During the course of the usability testing, participants were also asked about the role that collections play in their normal searching behaviors. Their comments and behaviors of participants interacting with the IMLS Digital Collection Registry point to findings of earlier studies that suggested that users have a "vague" understanding of what collections are. Participants in this study used multiple meanings for "collection' in the

course of our interviews, however their use of the term was not necessarily vague as much

as it was contextually bound. Within a particular context, participants appeared to have a

firm grasp on what the meaning of collection was. Among the ways they used collections

were:

- Collections are institutions
  "The Massachusetts Historical Society has a good collection"
- Collections are specific groupings of items within an institution
  "I've used the Berryman collection before."
- Collections are groupings of thematic items
  "I'm looking for a good collection of football images..."
- Collections are groups of items by format
  "I've seen this poster collection."

Participants seemed to have few concerns about the dynamic meaning of collection because

for them, collections were a "means to an end," namely finding items that were relevant

for their research, teaching or advising of graduate students.   Rather than trying to pin

down a specific meaning of "collection" it may be more fruitful in the context of the

aggregated digital collections to pay closer attention to what collections *do* instead of what

they *are*.   For participants here, collections:

- provided context for items
- provided points of access to items
- helped define expectations

During their interaction with the IMLS DCR participants mentioned several facets of

collection description that were useful for establishing context. Participants were

particularly interested in information that identified the scope of items they would find in

collections. In selecting collections to look at, participants considered geographic and

temporal coverage in addition to the suggested formats of items. One user was particularly

interested in how comprehensive a collection was. This user primarily relied on large

commercial databases such as *Early English Books* and appreciated when DCR provided

the number of collections for a given category. At present the DCR does not offer similar information about the extent of individual collections. Including a count of available items may be possible when integrating collections descriptions with item-level records may provide researchers additional context not currently available. However, extent only partially points to the comprehensiveness of a particular digital collection. Collections metadata that offers information about how representative it is of the original physical collection may also provide users clues about its comprehensiveness. Like other interests that are particular to individual scholars, this may point to the need to better understand what scholars consider comprehensive (using *Early English Books* as an example, understanding comprehensiveness is easier since it is based on a limited set of materials. These limits are less easily defined for archival/non-published material since the extent of all existing collections is unknown).

Understanding the context that collections created helped participants develop expectations for whether the collection would yield useful items. Perhaps because of their frustrations with individual sites, participants included an expectation of services along with their understanding of collections. When participants encountered a collection or institution they had used in previous research they often commented about how useful or un-useful those collections were. Regardless of whether the collection held relevant sources, the user's experience with that collection defined expectations of what they would find through the DCR. This was particularly true if a participant had used digital collections and services represented in the DCR, although experience with physical collections also created expectations. The importance of services appears tied to the

scholars need to assemble a large amount of data in order to conduct their research. Collections which provide efficient mechanisms for finding and using items that they find was key in defining a positive experience. Participants expectations were higher for institutions that they considered well organized and user focused.

Future Research and Development

While the information-seeking behavior studies mentioned above offer little towards defining what collections *are*, they offer a glimpse at what scholars *do* in the process of research and writing. "The access resources used by scholars....are of particular interest because they can mediate the path of research by encouraging certain directions and introducing barriers to others" (Palmer, 2005). The comments of participants and from subjects of broader studies are suggestive for future development of services offered by the IMLS Digital Collections Registry that extend beyond improvements in collections-level metadata. By considering the IMLS DCR not only an access tool, but also a research tool (a means to an end), affordances can be added that encourage existing patterns of scholarly behavior.

Because scholarly research is often an iterative and centrifugal process that may take place over months or years, the ability for scholars to build personal collections that lead them back to resources is a fundamental activity (Palmer, 2005). Currently many digital repositories, including the IMLS DCR, do not offer an easy or efficient mechanism for scholars to assemble findings into personal research collections or bibliographic note-taking databases. Offering scholars the ability to extract information, both at the collection and item level, from the IMLS DCR could increase the value and usefulness as a research

tool.

Scholars here and in other studies also cited the importance of advice from colleagues in locating resources of interest Brockman, William S.; Neumann, Laura; Palmer, Carole; Tidline, Tonyia J., 2001; Palmer, 2005). Collections-level metadata may be of particular use in these contexts as a colleague may not be able to identify individual items of interest. Several participants commented that a collection of material would be of interest to colleagues and students with whom they worked. Enabling scholars to easily forward references via e-mail or other means would facilitate the types of networked collaboration that scholars are increasingly using.

One participant in this study mentioned the usefulness of being able to review materials they had previously identified as relevant without having to retrace the steps through the many layers offered. Scholars willing to share their assemblages of materials could benefit others working in similar areas or other audiences unfamiliar with a particular topic (e.g. K-12 educators seeking resources in a particular area assembled by a academic researcher). Facilitating the development of thematic collections from within the IMLS DCR by scholars could also enable the "flow and exchange of information among scholars" (Palmer, 2005). As in other thematic collections, these need not necessarily be the work of a single scholar, but could be collaboratively created by a community with shared interests.

What is unclear from current practice is whether metadata is sufficiently homogeneous enough to support these types of features. Much of the recent work of the OAI community has been on improving metadata quality and shareability, with the goal of

improving the ability of OAI service providers to index, augment and normalize harvested metadata. While improvements in these areas may enhance scholars ability to search and identify resources, they do not yet address the needs of scholars for using what they have found. By better understanding the needs of scholarly researchers, the OAI community can look beyond shareable metadata towards servicable metadata and digital objects (resources that can easily integrate into scholarly research practice).

Conclusions

The interaction of participants with the IMLS Digital Collection Registry suggests that additional and broader research is necessary to understand the complex and dynamic way that users understand collections in the context of a digital repository. One implication for the IMLS Digital Collection Registry is that context is a key component of users understanding of collections. At present, users are only able to establish context within the DCR through actual browsing activities. By considering the DCR a collection itself, relatively simple changes to the current interface that surfaces contextual information about the DCR would be of immediate utility to humanities scholars. Examples of useful contextual information would include the total number of collections described and the chronological span of collections (or date spans where the majority of collections fall). Scholars also appreciated features which were initially targeted at NLG projects and IMLS staff and was therefore pushed lower in the interface. Because scholars may begin their browsing behavior based on expectations from particular collections/institutions making links to these features more prominent may encourage this behavior. From this study it is unclear what effect making the search feature more prominent would have. Perhaps users

would find search a more attractive option, if the scope of the IMLS DCR were more easily understood. As seen here, users frequently found browsing necessary to establish this context before using the search feature.

Participant frustrations outside of the DCR also suggests that Donald Water's concerns that collection registries by themselves will not necessarily address the needs of users. While a collections registry will lead scholars to available cultural heritage collections, the variety of implementation strategies employed by projects often creates a frustrating experience for users. However these frustrations may suggest the value of integrated collection-level and item-level repositories. User expectations of easily finding and using items is often hampered by the lack of (or diversity of) utility on individual collection sites. An item-level repository that takes advantage of collection-level descriptions, yet provides scholars with a common set of services may better meet their needs than a collections registry alone.

Through this and other usability testing, the IMLS Digital Collections Registry is addressing one of Donald Water's concerns by including users in the design and development of a collections-level metadata repository. Because digital collection registries are relatively new developments for digital resources, the project is also helping to outline the issues inherent in aggregating resources across IMLS funded digital collections. Beyond "connecting with work across institutions," involving users also suggests the need to connect directly with their work practices in order to make cultural heritage resources not only discoverable, but usable.

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