The Promise and Practice of Curating Legacy Software: Exploring the J.C.R. Licklider Papers

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Background

At MIT Libraries, we have begun work on developing a global platform for scholarly knowledge discovery, acquisition, and use [1]. Our internal pivot towards models of ***inside-out collecting*** [2] has encouraged exploration of different types of institutional content.

As an institution with a rich history of computing and technological innovation, an area ripe for further exploration of potential content is software that has been produced as research output. As both an artifact and producer of artifacts, software retains unique value, of enduring cultural, historical, and institutional significance.

Research Questions

- **What unique content related to software do we already have in our collections?**
- **What can software and all of its related artifacts tell us about the history of computing?**
- **What makes software meaningful and useful in different contexts?**

Case Description

In the Spring of 2017, I began digging into collections with software related content at the Institute Archives & Special Collections (IASC) at the MIT Libraries. Together with IASC archivists, we identified the papers of J.C.R. Licklider as an initial collection for exploration.

Licklider is one of the most important computing minds of the 20th century. He is widely hailed as an influential figure for his visionary ideas around personal computing and human-computer interaction. In my survey of the collection, I looked specifically for materials related to the development of the **GRAPPLE** software, a dynamic graphical programming system written in the now-defunct programming language MDL (which stands for "More Datatypes than LISP") [3]. Materials included: print outs of code, user manuals and technical reports, correspondence, and undated computer tapes.

Potential Use and Users of Materials

Computer Tape Reel

Figure 1. Computer tape reel, undated, box 17, J.C.R. Licklider Papers, 1938-1995 (MC 499), Institute Archives and Special Collections, MIT Libraries, Cambridge, Massachusetts.

Archivists:
- Test acquisition and ingest workflows
- Investigate access & preservation strategies (migration, emulation)

Scholars/Hobbyists:
- Historians of magnetic tape storage
- Reconstruct GRAPPLE for pedagogical purposes

Print Outs of Source Code

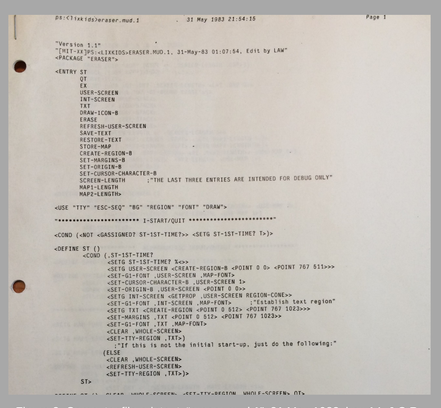


Figure 2. Computer file printout, "eraser.mud.1", 31 May 1983, box 14, J.C.R. Licklider Papers, 1938-1995 (MC 499), Institute Archives and Special Collections, MIT Libraries, Cambridge, Massachusetts.

Archivists:
- Design + test access scenarios for hybrid collections

Scholars/Hobbyists:
- Study evolution of coding language
- Evidence of defunct coding syntax (i.e., packages, functions, specs)

User Manuals & Technical Reports

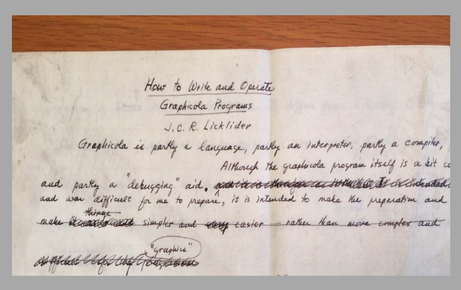
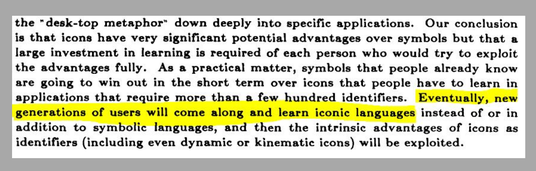


Figure 3. Manual, "How to Write and Operate Graphicola Programs", undated, box 16, J.C.R. Licklider Papers, 1938-1995 (MC 499), Institute Archives and Special Collections, MIT Libraries, Cambridge, Massachusetts.



the "desk-top metaphor" down deeply into specific applications. Our conclusion is that icons have very significant potential advantages over symbols but that a large investment in learning is required of each person who would try to exploit the advantages fully. As a practical matter, symbols that people already know are going to win out in the short term over icons that people have to learn in applications that require more than a few hundred identifiers. Eventually, new generations of users will come along and learn iconic languages instead of or in addition to symbolic languages, and then the intrinsic advantages of icons as identifiers (including even dynamic or kinematic icons) will be exploited.

Figure 4. Text from Licklider, J.C.R. *Graphical Programming and Monitoring Final Technical Report*, U.S. Government Printing Office, 1988, 17. http://www.dtic.mil/dtic/tr/fulltext/u2/a197342.pdf

Archivists:
- Explore description + access scenarios for hybrid collections with digital instantiations

Scholars/Hobbyists:
- Envision new approaches to old HCI problems
- Discover foundations for emojis! 🤗

Discussion

The results of this exploratory research suggest a wide range of potential use and users for both the software itself and related documentation. For archivists, curating legacy software can provoke new ways of envisioning access to and use of hybrid collections, prompting new research and development agendas. For scholars, materials can be used for research into institutional histories (e.g., government-funded computing research projects), biographical histories (e.g.,Licklider), as evidence of now-extinct programming languages (e.g., MDL), or in pedagogical endeavors (e.g., reconstruction of software), among other endeavors.

References

[1] Massachusetts Institute of Technology. Institute-wide Task Force Report on the Future of Libraries. Preliminary Report. October 24, 2016. https://future-of-libraries.mit.edu/sites/default/files/FutureLibraries-PrelimReport-Final.pdf

[2] Dempsey, Lorcan. "Library Collections in the Life of the User: Two Directions." LIBER Quarterly 26, no. 4 (2016): 338–359. doi:http://doi.org/10.18352/lq.10170.

[3] GRAPPLE Interim User Manual, 11 October 1981, box 14, J.C.R. Licklider Papers, 1938-1995 (MC 499), Institute Archives and Special Collections, MIT Libraries, Cambridge, Massachusetts