

**ASSESSMENT OF DIGITAL PRESERVATION NEEDS TOWARDS
CURRICULUM DEVELOPMENT IN THE
UP SCHOOL OF LIBRARY AND INFORMATION STUDIES**

Jonathan D. Isip

*School of Library and Information Studies
University of the Philippines Diliman*

Abstract

Digital preservation concerns the policies, strategies, and actions undertaken to ensure continued access to digital information over time. These actions are guided by standards and guidelines which are reflected in courses and certifications on digital preservation. In the Philippine setting there is no established course on digital preservation in the undergraduate LIS curriculum and practitioners rely mostly on seminars and workshops for education on the subject. The paper identifies the ideal competencies for digital preservation as observed from industry needs with the goal of integration into the existing curriculum. Data was collected by document analysis of known standards and the use of qualitative interviews with five institutions, one professional organization, and two universities. A need for digital preservation was observed in respondent institutions, but also revealed the institutions' lack of awareness of digital preservation theories and standards. The proposed digital preservation course by the University of the Philippines School of Library and Information Studies was found to satisfy most needs. The majority of unsatisfied needs were observed to be management related and indicative of the need for a separate course in archival management.

Keywords: digital preservation, curriculum development, LIS curriculum, archives management

Introduction

Archives serve as repositories for records of enduring value, often documents created as part of the process of transaction of business or generated as compliance of legal obligations (Bradsher, 1989). Today, these records are often in digital format, either born as such or converted from an analogue format, preferred because of their convenience and speed (Hunter, 2007). The systems created to manage these records are often created by programmers in the field of Information Technology

governed by the principles of their field, which emphasize efficiency and reliability so as to effectively and rapidly manage large amounts of information. This is a concern to archivists as vital records may be found in those systems, and it is the duty of the archivist to ensure continued access to the information in those digital records (Choi & Rasmussen, 2006).

Digital preservation is concerned with the policies, strategies, and actions undertaken to ensure continued access to digital information over time (ALCTS Preservation and Reformatting Section, Working Group on Defining Digital Preservation, 2007). It is focused on preserving the intellectual integrity of a digital record, as distinguished from traditional preservation that must also ensure the longevity of the physical carrier so as to preserve its intrinsic value. Digital records are likely to outlast the system or software designed to retrieve and interpret it, so digital preservation must focus on limiting the loss of information due to system obsolescence or that occurs when a file is created, transmitted, copied, or otherwise manipulated; by using a high-quality sustainable format that captures as much content as technically possible (Society of American Archivists, 2015).

Standards such as the ISO 14721:2012, which defines a reference model for an Open Archival Information System (OAIS), and the Digital Curation Lifecycle Model by the Digital Conservation Center serve as guidelines for the practice of digital preservation as taught in courses integrated with LIS programs or as continuing education seminars. The latter is more prevalent in the Philippine setting while the LIS curriculum only covers some concepts scattered among different courses in Information Technology, Archival Studies, or Media Librarianship. There is no curriculum specifically for archives, which is discussed as a subspecialty in library science or in museum studies. It is thus difficult for students to integrate and apply archival concepts to digital media that are often discussed in IT courses.

Archival Theory and Electronic Records

In *Electronic Records, Paper Minds: The Revolution in Information Management and Archives in the Post-Custodial and Post-Modernist Era*, Terry Cook (1994) encouraged a shift from an emphasis on physical records to a focus on their conceptual management. He justified this paradigm shift as a need for archives to evolve along with the community that justifies them, as well as evolving media.

The transmedia shift from traditional paper-based philosophies of archival studies indicates the need to augment the traditional archival studies curriculum with concept and theories that reflect the influence of electronic records. Hugh Taylor (1988) likened electronic records to the daily chatter of an oral society without written records, which thus require a different mindset in their management rather than simply assuming them to be reformatted analogue records.

Curriculum Development

James M. O'Toole (1990) criticized the "workshop mentality" of archival education because of how it contributes little to progress in the profession. He talked of how workshops introduce concepts

Isip, J. D. (2015). *Assessment of Digital Preservation Needs Towards Curriculum Development in the UP School of Library and Information Studies*. *Journal of Philippine Librarianship*, 35(ALIEP 2015 Special Issue), pp. 39-51.

as an overview and how the limited time allotment leads to the discussion of topics in a superficial manner, as well as fails to adequately assess how well the participants have understood the material. This also may also lead to theory neglected in favor of more time for praxis, counterintuitive when new topics like digital preservation are looking for direction.

In *Curriculum Development in Archival Education*, O'Toole divided archival education into seven clusters, namely: Introductory, Theory and Practice, Archival Functions, Institutions and Repositories, Record Formats, and Practicum. This allowed for a convenient listing of the competencies for each cluster. Similarly, Bastian and Yakel (2006) attempted to define an archival core curriculum by grouping courses, performing content analysis of syllabi, and examining recommended readings. Topical analysis was used to identify commonality between schools in general categories.

The approach of O'Toole, Bastian, and Yakel are applications of the behavioral-scientific approach to curriculum development, a logical step-by-step model that defines the objectives, content, method, sequence, and scope of a curriculum, focused on satisfying specific behavioral objectives so as to allow a tailor-fit curriculum to the actual practices of the profession (Bago, 2011). These objectives are derived from the over-aims and needs of the profession, specific instructional objectives, as well as democratic ideals and learning principles. Specific content is listed from these general objectives by establishing scope and sequence, i.e. courses, and identifying the appropriate learning experiences and evaluative measures for such.

Digital Preservation in the LIS Curriculum

Archiving is clustered as part of the LIS curriculum in the Philippine setting, and digital preservation is often discussed outside the context of archives theory, often in Information Technology courses. This is strengthened by Republic Act 9246 which include teaching archives subjects in the scope of librarianship. While several institutions and professional organizations offer training programs, these are intended for continuing education on introductory archives administration (Golfo, 2014). A look at the curriculum of the UP SLIS shows that there is no distinct course on digital preservation (UP SLIS, 2014).

There is an abundance of foreign seminars and workshops on digital preservation. Of note is the Digital Archives Specialist (DAS) certification by the Society of American Archivists (SAA). This online course is targeted towards archivists transitioning to digital records, and includes an assessment exam for certification (SAA, 2014). Other programs are similarly targeted towards working archivists, albeit with a shorter time span to completion. The University of London Computer Centre offers a three-day Digital Preservation Training Programme (ULCC, 2015), while the American Library Association - Association for Library Collections and Technical Services provides a four-session online course on the fundamentals of preservation, including the challenges in preserving digital content in the context of physical formats (ALA-ALCTS, 2015). Similarly, the NorthEast Document Conservation

Center regularly conducts a two-hour live online seminar (called a webinar) to discuss concepts in digital preservation (NEDCC, 2015).

Several foreign universities offer a specific course or series of courses on digital preservation as part of their LIS or Archives degree. Wayne State University's SLIS curriculum offers a three-unit course in digital curation and preservation that discusses digitization and preservation standards, selection criteria, copyright and professional ethics, the data curation lifecycle, strategies for preservation, metadata, integrity and authenticity of digital content, trusted digital repositories, and risk management of digital content. This is alongside several other courses that combine towards a specialization in Digital Content Management (Wayne State University, 2013). The University of South Australia offers a four and a half unit elective course on Digital Preservation as part of their graduate program on Library and Information Management (University of South Australia, 2015).

Competencies in Digital Preservation

Golfo (2014) emphasized the need to equip archivist with the necessary skills to handle and manage archives in a different format. A formal degree in archival studies was proposed as an effective long term solution to challenges faced by practicing archivists in the country (p. 74). This paper compiles the needs of the archives industry based on interviews and the competencies on digital preservation identified by standards as well as foreign courses. These competencies are presented as the core components of a course on digital preservation, with the intent of eventual integration with the existing Bachelor of Library and Information Science curriculum of the UP SLIS. The competencies are clustered according to archival function but clustering does not imply the necessity to teach the said clusters in any specific sequence.

Data Collection

Interviews were conducted with respondents kept anonymous. Three institutional archives, two collecting archives, and one professional organization were interviewed. They were initially selected based on their location in Metro Manila, and were interviewed when they expressed their willingness to discuss their digital preservation activities. Five other institutions were contacted but did not reply to indicate their willingness to be interviewed.

The interviews discussed the digital preservation programs planned and currently undertaken by the respondent institutions, the routine activities done within those programs, as well as the standards and guidelines which govern said programs. Respondents were also asked which competencies and qualifications they seek from potential employees pertaining specifically to digital preservation, as well as if they require a specific educational background.

The study also included competencies specified by four standards related to digital preservation: ISO 14721:2003 which defines a reference model for an Open Archival Information System (OAIS),

the Producer-Archive Interface Methodology Abstract (PAIMAS) that expands on the Ingest and Administrative functions of the OAIS Reference Model, the Trustworthy Repositories Audit & Certification (TRAC) checklist that identifies the components of a trustworthy digital repository, and the PREMIS Data Dictionary for Preservation Metadata which defines core metadata elements in a digital preservation context based on the Archival Storage function of OAIS. Similarly, the study included the competencies from foreign seminars and courses that are openly accessible via the respective institutions' websites with the use of curriculum mapping.

The curriculum maps detailed skills and objectives detailed in class syllabi or course curricula, the theory supporting such activities, and then consolidated those under the general topic to which they belong. The same method was applied to the activities of the archives interviewed in Metro Manila. The identified topics and activities were then matched to their equivalent components in the aforementioned standards, resulting in a list of component competencies for digital preservation.

Competencies of Digital Preservation in an Ideal Curriculum

The competencies are broadly clustered into three fields; Archives, Information and Communications Technology, and Management. These fields indicate which set of skills are applicable to the specific competency under the field, and does not imply that the competency must be taught in courses of that field. Thus, competencies that involve skills in ICT or Management may still be taught in archives courses and not necessarily in ICT or Management courses.

Archives Field:

Archives Theory – Archives theory explores the rationale of the profession and the justification for doing preservation. It also includes foundational concepts in preservation as well as discusses the archival functions.

Nature of Records – It is necessary to understand the physical and intellectual properties of the materials to be archived. Discussion on the nature of records involve identifying the value of records, the types of records and why they are created, the records life-cycle or continuum, and the challenges in preserving digital content (information, not the carrier).

Preservation Planning – Preservation planning is concerned with the theory and practices done in preparation for preservation. This involves actions such as defining which properties of a record to preserve, designing packages for preservation, developing strategies and standards to ensure complete preservation (including measures to retain fixity, data integrity, authority, and so on), planning migration protocols, monitoring the needs of the expected clients and the available technology, as well as reconciling preservation requirements with the existing preservation capabilities of their institutions.

Ingest – Ingest is the OAIS functional term for appraisal and acquisition. From an archives perspective this topic involves assigning preservation levels, coordinating updates or accruals, receiving submissions (known as Submission Information Packages or SIP in OAIS), generating and committing archival packages (Archival Information Packages or AIP in OAIS), matching content with rules, restrictions, and agreements, and providing feedback to SIP producers.

Digital Curation – Digital curation deals with the organization of the AIPs and their corresponding metadata. It involves the creation of a data dictionary as well as ingest, accessioning, and arrangement of electronic records.

Description (Metadata) – Description involves the use of metadata to provide electronic records with contextual and content information. Using the PREMIS data model, this includes the definition of object, intellectual, event, agent, and rights entities; as well as providing identifiers and describing the relationships between objects and entities. Metadata also includes information about file format, specifications on the storage environment, object characteristics and composition level, and information on data fixity, integrity, authority, and inclusion of digital signatures. A digital archivist must also be familiar with and able to use cataloguing and indexing standards and tools for managing digital content, while also having the foundations for traditional indexing.

Access – To facilitate access to digital content, archivists must be able to translate the metadata information on the record's reference, context, provenance, fixity, and packaging and provide said information to the client.

Information and Communications Technology Field:

Appropriate Technologies – As counterpart to knowing the nature of records (content), a digital archivist must also understand the corresponding technology to access the information. They must be able to use, maintain, and recommend reliable hardware, software, and network solutions appropriate to the needs of the archive, as well as understand and practice infrastructure independence in view of technology obsolescence. They must be knowledgeable of preservation, storage, and migration strategies to ensure continued access to the information content, of techniques to preserve information from databases such as those for email communications, as well as of the principles of digital forensics to ensure data authority.

System Infrastructure – Knowledge of system infrastructure involves the design and use of information management systems, the ability to establish digital repositories, and the management of database systems.

Metadata Storage – Electronic records must be associated with their corresponding metadata and stored

accordingly. The digital archivist must be able to define and supply metadata values, provide extensibility and compatibility of metadata between different information systems to allow sharing, as well as define formats for standard elements such as date and time.

Access Management – Archival records may have different levels of access. The archivist must be able to ensure that the security and privacy of the electronic records are protected by the information system used to store and access them. They must also have knowledge of web development so as to properly evaluate the reliability and security of proposed systems.

Advocacy – An archivist must be able to use ICT tools such as social media and community forums software to promote the collections and services of the archive.

Management Field:

Organizational Infrastructure – An archivist exercises management not just on the records but also on the institution storing said records. They must ensure that the archive is capable of handling electronic records based on available resources and skills of the staff (i.e. perform a viability assessment) using auditing tools and standards. They must also know how to create contingency and succession plans, make escrow arrangements, identify the service communities and define policy relating to service levels. They must also be able to write policies and procedures on legal permissions and access, feedback, financial, and challenges to rights. They must also be able to communicate with the administration as well as serve as the bridge between the administration and the archive. The ability to generate statistical analysis to support operations, to manage and plan appropriate facilities, to manage human resources and lead the archives team, and to manage the system configuration of the archive are essential skills in a digital archivist.

Ingest – It is important to negotiate with information producers to acquire archival materials. Ingest involves the construction of a formal model for acceptance or transfer of records, as well as the formalization of the contractual and legal obligations of the involved parties. This includes the definition and validation of transfer conditions, creation of a delivery schedule, and acknowledgment of the change in management responsibility over the records upon transfer.

Archival Storage – Archival storage defines the processes involved in handling AIPs and assigning responsibilities to the concerned members of the team.

Access Management – Access management in a management standpoint deals with developing the policies access, copyright, privacy, and confidentiality of the records; with an eye towards promoting the archive's role in an institutional context. Identifying, establishing, and coordinating collaborative relationships with other archives are responsibilities that ensure the exposure and use of the archive's

collection.

Client Relations – Client relations involve communicating and working with user communities to address their information needs. This includes marketing the services of the archive, developing outreach programs, managing and responding to challenges or complaints, negotiating for resources, and probably presenting a business plan for digital preservation.

Vendor Relations – Vendor relations concern the acquisition of equipment. This cover the identification of potential vendors, communicating the needs of the archive in a technical language, providing vendor appropriate specifications, conducting bids, as well as negotiating payment terms and quality control policies.

Unsatisfied Needs in Digital Preservation

In 2014, the UP School of Library and Information Studies proposed a course entitled LIS 174: Introduction to Digital Preservation, with a prerequisite of LIS 160: Information and Communications Technology in LIS I and LIS 170: Introduction to Archives and Records Management. The three unit course was intended to provide a “theoretical foundation, fundamental knowledge, and practical skills to equip students in dealing with assessing, managing, and providing access to digital objects.” This course will be offered starting the first semester of A.Y. 2015-2016 to Bachelor of Library and Information Science students.

LIS 174 covers the theoretical foundation and relevant standards in digital preservation through lectures, classroom discussions, reports, papers, and practical exercises. It is grounded in archives theory and supplemented by IT principles, hardware, and software as tools for preservation. A comparison of the UP SLIS revised (with the inclusion of LIS 174) undergraduate curriculum with the previously identified competencies in digital preservation revealed that the courses in the revised BLIS curriculum satisfy most of those listed in the ideal curriculum for digital preservation.

Despite the comprehensiveness of the curriculum there are some competencies that remain unfulfilled. The majority of unsatisfied competencies were found to be in the archives and management fields. While some competencies have been partially fulfilled, they were included in the list if some specific skills were missing.

Archives field:

Ingest – The curriculum does not include the legal transactions involved in receiving submissions and providing feedback to producers after validating the submission.

Digital Curation – While students learn how to create a controlled vocabulary in traditional indexing,

there is no topic specifically discussing the creation of a data dictionary for describing digital content and carriers. Additional discussion is also required with regards to the arrangement of accessioned electronic records.

Preservation Planning – The curriculum must provide skills in monitoring the needs of the user community and assessing the available technologies. Furthermore, students must be given exercises or training in reconciling preservation requirements with preservation capabilities of their institution. This may be a good opportunity to discuss research and management techniques such as benchmarking and auditing.

Description (Metadata) – The curriculum adequately discusses the foundational concepts of description and metadata. However, practical experience is also necessary, especially with the different metadata standards.

Metadata Storage – Archivists must be trained to ensure extensibility and exportability of metadata to account for new or revised metadata standards. This also reflects the philosophy of infrastructure independence in creating digital preservation systems.

Management field:

Organizational Infrastructure – Outside of internships there is little training in the creation of policies and models relating to digital preservation. Digital archivists must be able to document the archival functions and their implications on policies, access rights, preservation actions, and the fulfillment of legal obligations. Similarly they must also know how to develop schedules and project proposals as well as perform assessments on feasibility, cost, and associated risks.

Access Management–Students must be trained on how to identify and establish collaborative relationships with other archives for the purpose of resource sharing and collection development.

Client Relations–Management training in client relations is necessary to identify their needs for prioritization of specific services, as well as to justify the archives’ position during negotiations for resources. Acquisition of equipment must also take into account the expressed needs of the user community.

Vendor Relations – Students must have a thorough understanding of the best practices in vendor relations so as to properly negotiate with the best interests of the archive in mind. They must be familiar with payment terms and obligations, standards in quality control testing, and techniques for negotiation of desired services.

Conclusion

The BLIS curriculum of the UP School of Library and Information Studies addresses most of the theoretical and technical competencies required in digital preservation. When compared with the ideal curriculum developed by observing standards and foreign curricula it can be observed that there is a need to train students in management, not of the records but of the archive and its processes. Archivists are also policy makers and managers and must thus be capable of making decisions in the best interests of the archive and its parent institution. Arguably some concepts such as staffing and budgeting would be similar to those taught in library management subjects, but there are policies unique to archives that must be taught separately. For example, the archivist must be able to draft and revise acquisition contracts to ensure that their archive possess preservation rights on the materials to be acquired.

There must be a management course specifically for the archives track of UP SLIS to address the unsatisfied digital preservation skills in the field of management. This course should focus on building skills relating to policy making, understanding of legal policies and procedures, protecting intellectual property rights and restrictions, establishing good client and vendor relations, minimizing risks, evaluating IT solutions for their appropriateness to the needs of the archive, and creating schedules and project plans, among others.

An incomplete curriculum without comprehensive courses that discuss all aspects of digital preservation is injustice not to the students alone but to the information they seek to preserve. In today's landscape of rapidly changing technologies, the archivist is pressed to provide the best access possible to their holdings, regardless of carrier. How can students even begin to tackle emerging information formats if they are not trained to manage and impose intellectual order on those formats that are now taken for granted, in the form of electronic mail, online databases, and even the humble digital picture and home videos.

The challenge in archival education is to develop students that are competent not just in the techniques, procedures, and standards of the profession; but also in the management of their respective archival institutions. This training of students as future policy makers would break the workshop mentality in core archives and LIS subjects and direct it to newer and higher fields of learning. Digital preservation, as aptly illustrated by the OAIS Reference Model, is a practice which involves the cooperation and communication of information producers, top management, user communities, and the archives as an integrated system. Any archives curriculum is thus continually challenged to adapt to the current condition of the system and arm the archivist with the necessary competencies. At the core, this continued development would strengthen the foundations of archival practice in the country and better position the profession to take a leading role in heritage preservation and nation building.

References

- ALA-ALCTS. (2015). *DPOE - Digital Preservation (Library of Congress)*. *Digitalpreservation.gov*. Retrieved February 28, 2015, from <http://www.digitalpreservation.gov:8081/education/courses/altcspresfundamentals.html>
- ALCTS Preservation and Reformatting Section, Working Group on Defining Digital Preservation. (2007). *Definitions of digital preservation*. Washington: ALA Annual Conference. Retrieved from <http://www.ala.org/alcts/resources/preserv/defdigpres0408>
- Bago, A. (2001). *Curriculum development: The Philippine experience* (pp. 91-94). Manila: De La Salle University Press.
- Bastian, J., & Yakel, E. (2006). Towards the development of an archival core curriculum: The United States and Canada. *Archival Science*, 6(2), 133-150. doi:10.1007/s10502-006-9024-4
- Bradsher, J. (1989). An introduction to archives. In J. Bradsher, *Managing archives and archival institutions* (1st ed., pp. 1-17). Chicago: University of Chicago Press.
- CCSDS. (2012). *Reference model for an Open Archival Information System (OAIS)* (2nd ed.). Washington, DC: CCSDS Secretariat. Retrieved from <http://public.ccsds.org/publications/archive/650x0m2.pdf>
- Choi, Y., & Rasmussen, E. (2006). What is needed to educate future digital librarians: A study of current practice and staffing patterns in academic and research libraries. *D-Lib Magazine*, 12(9). Retrieved from <http://www.dlib.org/dlib/september06/choi/09choi.html>
- Cook, T. (1994). Electronic records, paper minds: The revolution in information management and archives in the post-custodial and post-modernist era. *Archives and Manuscripts*, 22(2), 300-329.
- Cook, T. (1997). What is past is prologue. *Archivaria*, 43, 17-63.
- DigCCurr. (2009). *DigCCurr Carolina digital curation curriculum project*. Ils.unc.edu. Retrieved May 17, 2015, from <http://www.ils.unc.edu/digccurr/index.html>
- Digital Curation Centre. (2015). *DC 101 materials | Digital Curation Centre*. Dcc.ac.uk. Retrieved May 17, 2015, from <http://www.dcc.ac.uk/training/train-the-trainer/dc-101-training-materials>

-
- DPTP. (2015). *Digital Preservation Training Programme*. Dptp.org. Retrieved May 17, 2015, from <http://dptp.org/>
- Emans, R. (1966). A proposed conceptual framework for curriculum development. *The Journal of Educational Research*, 59(7), 327-332. doi:10.1080/00220671.1966.10883370
- Golfo, M. G. P. (2014). Educating Filipino archivists amidst the challenges of the 21st century archival profession. *Journal of Philippine Librarianship*, 34, 70-78.
- Hunter, G. (2007). *Impact of information technology on local government archival records* (pp. 5-14). Council of State Archivists.
- Isip, J. D. (2015). *Digital preservation needs assessment in the archives profession towards LIS curriculum development* (Unpublished B.L.I.S. thesis, University of the Philippines Diliman, School of Library and Information Studies, Quezon City, Philippines).
- ISO/TC 20/SC 13. (2014). *ISO 14721:2012 - Space data and information transfer systems -- Open archival information system (OAIS) -- Reference model*. Iso.org. Retrieved September 8, 2014, from http://www.iso.org/iso/home/store/catalogue_ics/catalogue_detail_ics.htm?csnumber=57284
- Madrid, J. M. (1999). *A study of the undergraduate library science programs in selected library schools in Metro Manila with implications on the education of information professionals and curriculum development* (Unpublished M.L.S. special problem, University of the Philippines Diliman, Institute of Library Science, Quezon City, Philippines).
- Manoff, M. (2004). Theories of the archive from across the disciplines. *Portal: Libraries and the Academy*, 4(1), 9-25. Retrieved from <http://dspace.mit.edu/bitstream/handle/1721.1/35687/4.1manoff.pdf>
- NEDCC. (2015). *Current Programs List — NEDCC. NorthEast Document Conservation Center*. Retrieved February 28, 2015, from <https://www.nedcc.org/preservation-training/training-currentlist>
- O'Toole, J. (1990). Curriculum development in archival education: A proposal. *American Archivist*, 53(Summer), 460-466.
- Pearce-Moses, R. (2005). *A glossary of archival and records terminology* (1st ed.). Chicago: Society of American Archivists.

Prahalad, C. K., & Hamel, G. (1990, May-June). The core competence of the corporation. *Harvard Business Review*, 79-90.

Society of American Archivists. (2014). *Digital Archives Specialist (DAS) Curriculum and Certificate Program*. Retrieved September 8, 2014, from <http://www2.archivists.org/book/export/html/10274>

Strodl, S., & Rauber, A. (2007). Preservation planning in the OAIS Model. In *International Conference on the Digital Preservation*. Beijing, China.

Taylor, H. (1988). Transformation in the archives: Technological adjustment or paradigm shift? *Archivaria*, 25(Winter 1987-88), 12-28. Retrieved from <http://journals.sfu.ca/archivar/index.php/archivaria/article/view/11451/12394>

Udelhofen, S. (2008). *Keys to curriculum mapping*. Thousand Oaks, Calif.: Corwin Press.

Wayne State University. (2013). *Course profile: Digital curation and preservation*. Michigan: Wayne State University. Retrieved from <http://slis.wayne.edu/profiles/7920.pdf>