



Library Collection Disposal: new tools for media management

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Abstract:

This paper discusses sustainable collection management and the environmentally, economically, and socially responsible management of information media life-cycles in the library. This is an important distinction to the more common association of preservation and sustainability. Instead, collection management, in the context of media evolution and interaction, is examined through a sustainability lens from acquisition to disposal.

Many libraries, as well as other collecting institutions, recognize deselection as an important management tool for collection sustainability under current resource strains. How libraries then handle deselected material is an important component of the sustainable library. Many library organizations and systems consider the environment and sustainable resource management as core social responsibilities (for example the American Library Association, the Calgary Public Library, and the International Federation of Library Associations and Institutions). This suggests, due to impacts inherent to any disposal activity, collection disposal also falls under these professional responsibilities.

Although library and information workers are clearly concerned about the impacts of their activities, as indicated by the writings of many in the profession, discussion about information media and the environment focuses mainly on computers, digital libraries, or paper consumption, and has not yet examined collection disposal in detail. This is problematic given: the environmental impact of new and old media disposal, the economic impact of resources and services needed for disposal methods, and the social impacts related to increased environmental awareness and perceptions of responsibility.

Already, multi-criteria decision-making tools are used in acquisition and deselection. Likewise, sustainable collection disposal will need to consider various environmental, economic, and social criteria.

Collection disposal is explored through an investigation of library experiences in the province of Alberta, Canada. Multi-criteria decision-making tools relevant to environmental, economic, and social issues are addressed and applied to the context of information media life-cycles and collection disposal in libraries.

1. Introduction

The library profession is striving to cultivate and promote sustainability. Seen as a key to its survival in a 21st century environment such a focus also reflects the changing attitudes and values of society at large (Calgary Public Library, n.d.; Jankowska, 2008; Moore, 2005). The sustainability issues being addressed by libraries are diverse, including everything from buildings and operations to collection content and programming (Antonelli, 2008; Link, 2000; Rickert, 2001). However, key areas central to core library activities still exist which have not been fully explored from a sustainability perspective. Collection management is one of these areas.

Collection sustainability, as often used, is understood to relate to aspects of preservation. It therefore, does not cover collection management issues in their entirety. Instead collection sustainability and sustainable collection management might be viewed more holistically as the responsible management of material life-cycles. It is no longer possible to include everything in one collection and it is increasingly clear that infinite preservation is not possible either. Libraries, and even museums, are finding it necessary to deselect in order to continue to serve their users, operate in an economically sustainable manner, and support the sustainability of the library as a whole (Johnson, 2001; Jordan, 2003; Merriman, 2008; Slote, 1997).

The understanding of sustainable collection management can be further developed by considering collection disposal through a sustainability lens. As disposal necessarily follows deselection, a practice already becoming associated with collection sustainability, this is an appropriate area to test new definitions. In addition, it is closely tied to other concerns emerging in the library; the environmental impact of information media disposal (Hischier & Reichart, 2003; Levinson, 1998; Zazzau, 2006), the economic impact of resources and services needed for disposal (Fisher & Yontz, 2007; Gregory & Le Ber, 2004), and the social impacts related to increased environmental awareness and perceptions of responsibility (Beebe, 2002; Briscoe, 1987; Briscoe, 1991; Dike, 2007; Ellis, 1981; Zazzau, 2006).

Research of collection disposal experiences was undertaken and is explored here. Further investigation, by way of viewing collection disposal as part of a greater life-cycle is also discussed. Multi-criteria decision-making tools (MCDM) are addressed as methods to inform sustainable collection management practices in light of these various sustainability issues associated with collection disposal.

2. Experiences and perspectives from Alberta in collection disposal

Since December 2009, interviews have been conducted with collection management professionals within the province of Alberta¹. Using The Alberta Library (TAL) membership groupings as a guide, libraries from each member category were approached to participate in an effort to capture the

¹ This research has been conducted to fulfill requirements for the Environmental Design Master's degree program at the University of Calgary, in Calgary, Alberta, Canada.

diversity of experiences in Alberta libraries². To date, individuals from seven libraries have participated representing the public, college, university, and regional categories. Interviews were structured to gather information regarding the contexts, key characteristics, and key impacts of collection disposal.

2.1 Common contexts

Each participant presented a variety of factors which contributed to collection disposal at their library, presenting very unique contexts. This was expected given the diversity of mandates and library types represented. However, there were elements of these contexts that were experienced in all libraries. If the life-cycle of library materials is considered, it can be seen that materials have different end-of-life scenarios and exit the library system at different points in the cycle. This produced *ongoing* and *periodic* disposal streams influenced by condition and currency.

Ongoing deselection was present in all cases and thought to consist mostly of damaged material unfit for circulation (stream 2 in figure 1). This type of deselection was seen to be closely tied to daily circulation activities. Depending on the particular library mandate, available staff compliment, resources, and condition, selected items were sometimes considered for repair or reorder.

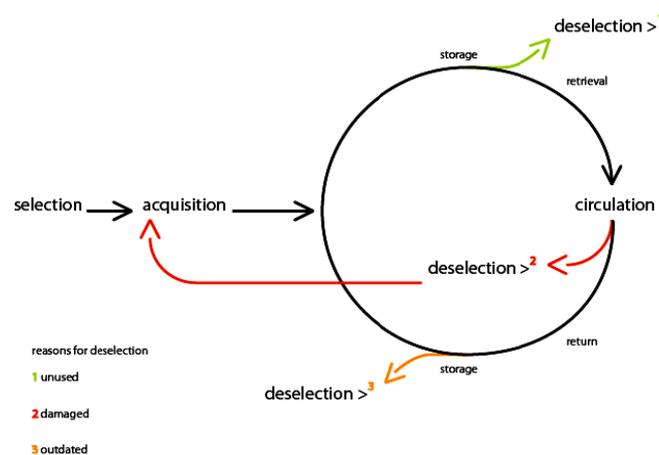


Figure 1. Library material life-cycles: collection dynamics.

In addition, participants found it necessary to dispose of material donated to the library, a practice also documented in other cases (Gregory & Le Ber, 2004). Several libraries developed restrictive donation policies to cope with the large flow of donations. Donations appear continually and so contribute to the ongoing workflow of handling and disposing deselected material³.

Periodic deselection was organized and purposeful, often cited as being tied to high level planning and specific mandates regarding material content. Certain levels of currency were seen as required to best serve users, each library using their own definition. Currency can be interpreted in several ways, reflecting characteristics of content and format, and can be illustrated by streams 1 and 3 (figure 1).

² Although members from the technical institute and special library categories were approached there has been no response from those wishing to participate at this time. See www.thealbertalibrary.ab.ca/about/members.html for a full listing of member libraries.

³ From this point forward collection disposal also encompasses donation disposal.

Accuracy, currency, and use are grouped under currency for this paper though all three were used by interview participants. Here, currency is used to describe the popularity of the content and subject matter as well as the style with which it is presented. Currency in this sense is not to be seen with a bias for the new although, age is a factor in some material flows.

Only with the university library did periodic deselection not stem from collection mandates. In this case it was thought that deselection might only be used, beyond material that could not be repaired, to remove duplicate reading list copies. It is possible to infer that the changing reading lists themselves reflect content currency.

Material in poor condition was also removed during periodic disposal. These materials were either missed by circulation or, through low circulation (stream 1 figure 1), had deteriorated with age. These factors are not necessarily related to content currency alone but are tied to qualities of format. Here, evolutionary pressures also influence format currency and so deselection (Johnson, 2001; Levinson, 1998). There are various patterns of information media use, and so format currency, depending on interaction with other technologies and function among other factors. Levinson's (1998) descriptions of media interaction and evolution have been adapted to illustrate these relationships in figure 2.

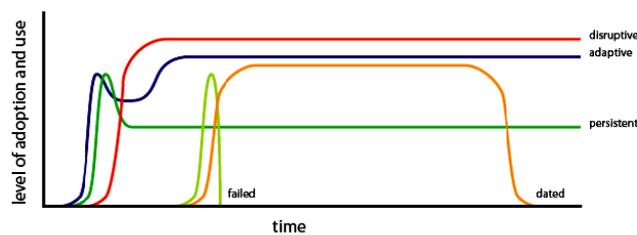


Figure 2. Technology life-cycles: interaction and evolution of media.

Several libraries deselected on the basis of format, removing tape cassettes and videocassettes en masse. It can be argued that this type of deselection comes down to use and so relates to content currency. However, low use may not necessarily be associated with content. It is likely that information media display content and format currency both coincidentally and independently. Legal issues were also a factor for at least one library. Certain audio-visual materials were deselected to honour licensing agreements. Licensing seems to concern an artificial type of content and format currency.

Space restrictions and changes to the use of space also prompted periodic deselection. Of the libraries interviewed; three had regularly planned deselection; two had only begun deselection in the last two years, planning to make it a regular practice; and one identified that it had been too long since the last deselection project. Long absences of deselection exacerbated space shortages and stimulated more intense deselection than in regularly planned projects. Building renovations also prompted extreme deselection for two libraries. Those that did not have regular deselection in place indicated that they were more likely to adopt them in light of recent experiences.

2.2 Common disposal characteristics

All of the libraries interviewed used several disposal methods to handle their deselected material. A combination of methods was needed to handle the volume of material exiting the library as well as to accommodate individual material characteristics. Each flow, as discussed above, had its own profile of suitable disposal methods. In general, the methods and priority with which they were used followed hierarchies similar to those found elsewhere in waste management; reuse, through sale and donation; recycling, paper and plastic; and landfill (Pongrácz & Pohjola, 2004; Tchobanoglous & Kreith, 2002).

All libraries were active in sale and donation. Sale tables were hosted by the library or closely associated groups and were available for library community members. On occasion sales were supplemented with give-away material. Two libraries only used give-away to distribute material in the library. Alternatively, donations were made to regional and international organizations. In the case of specialized materials, offers for donation or exchange were presented to institutions, such as universities, via listserv or other direct means. Only two libraries were active in using book-buyers. The physical condition, format, and content of material was suggested by many to influence whether or not items were considered to be handled in this way, and in deciding what kind of sale or donation method would be most successful.

Many libraries have been recycling for some time so it was no surprise that six of the seven libraries did this (Fisher & Yontz, 2007; Gregory & Le Ber, 2004). Paper recycling is common and can often accommodate most of the different print materials found in libraries. More difficult and complicated is the recycling of other, non-paper, items. The only library that did not recycle was able to handle nearly all collection disposals through give-away and donation and so had not yet explored this method. Two libraries were able to accommodate other collection formats into their recycling due to the availability of plastic recycling in their areas.

Recycling was reserved for damaged and unwanted items. The decision to send material in sound condition to recycling sometimes occurred before attempts at sale or donation. This often reflected staff expertise regarding the content and its desirability or the result of the capacity of sale and donation methods to absorb the flow of material. In addition, some collection material was required to be destroyed as per licensing agreements and so, while not suitable for sale or donation, could be recycled where services were available.

Libraries disposed of any leftover materials through regular garbage collection. In the province of Alberta, there is continuing work to reduce and divert the waste sent to landfills as well as investigation of alternative waste management methods. However, most municipal waste is disposed of by this method (Alberta Environment, 2004a; Alberta Environment, 2004b; Alberta Environment, n.d.).

2.3 Common impacts

Participants were also invited to discuss the various impacts of their chosen disposal methods. Environmental, economic, and social issues were revealed which had impacts both in and outside the library. All disposal methods had varying time, space, and cost impacts on the library. Some methods required specific staff expertise and physical labour contributing to their impacts at an organizational level. These impacts are also present in the deselection process and are known to collection

management professionals (Slote, 1997). Indeed, many of those interviewed included the impacts of deselection in their discussion of collection disposal.

Selecting a disposal method for specific items was intensive, especially when a library distributed material to multiple organizations. In some cases there were restrictions on what and how material could be accepted. Sale and donation needed certain expertise in assessing where material was best suited. This was particularly the case when dealing with outside organizations. Human resource time commitments were also an issue in recycling as mixed material formats had to be separated. Significant space was needed for sale, donation, and recycling, it being common that materials be amassed before shipping or collection. While it was recognized that there were also financial costs associated with collection services, nearly all libraries identified that recycling and garbage containers were filled by many activities, not just collection disposal. It was therefore difficult or impossible to attribute a specific cost to the services used by collection disposal. Revenue from sale was touched on as a positive impact by three libraries.

One of the most mentioned impacts of collection disposal was how it affected staff emotionally. Many discussed the guilt and distraught they experienced in deselection and disposal. Recycling was comforting, when present, as it was in-line with their environmental values. These emotional impacts stem from actual environmental impacts of disposal which were also cited separately. Indeed, several mentioned that they or other staff had often recycled library materials on their own time, when recycling was not present, not an uncommon theme (Briscoe, 1987; Briscoe, 1991; Ellis, 1981). Although there was still some negative impact associated with recycling it was seen as preferable to landfill. Three libraries however, were able to pre-empt these negative emotional impacts, by turning required material destruction it into a positive activity.

Impacts were also revealed which extended to external environmental and social issues. Participants acknowledged that collection disposal by recycling and landfill each had their own environmental impacts which varied depending on the physical properties of the formats being disposed. All libraries cited the reaction of the public to disposal activities as being a negative. The public was known to be upset when donations were sold or recycled. In addition, several libraries were prompted by these reactions to change the timing and method material was collected for recycling or landfill. However, several libraries also saw collection disposal as having social benefits for the community. Sale and donation, both in the immediate community and beyond, gave affordable access to materials. One library was cautious to donate internationally as it was difficult to select ethically appropriate material. Sending inappropriate material was seen to have a potential negative impact. This is a similar dilemma recognized in the end-of-life management of many consumer goods. Good intentions may result in waste diversion and instead burden communities (Carter, 2009; Miller, 2009; Staikos & Rahimifard, 2007; Zehle, 2009). Ironically, this may also describe the situation of many libraries overwhelmed themselves by donations.

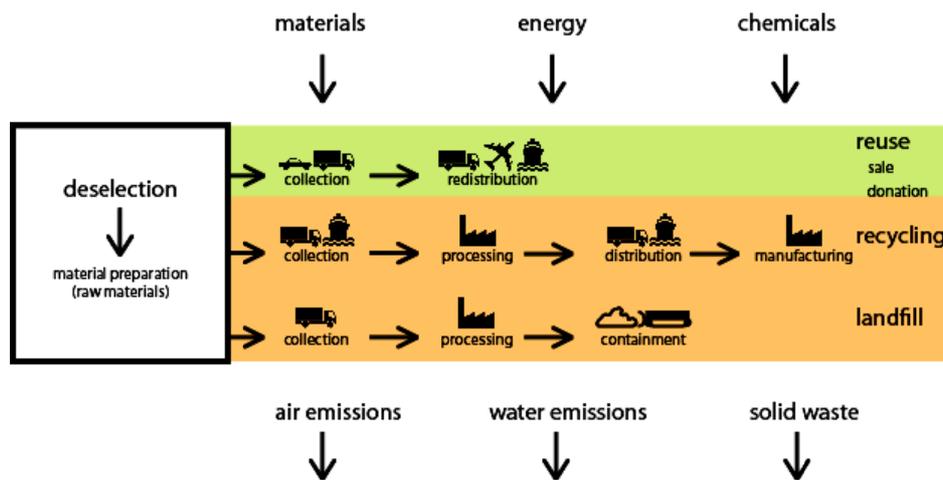
3. Decision-making

Given the picture painted by these experiences in Alberta, how then would libraries begin to make choices about sustainable collection disposal? There are many economic, social, and environmental factors that can be considered beyond those revealed through this research. What considerations should be taken and how can they be brought together? MCDM tools such as those already used in

acquisition and deselection processes, are designed to incorporate many of these, sometimes conflicting, economic, social, and environmental criteria (Johnson, 2001; Slote, 1997).

3.1 Three viewpoints

More and more it is becoming recognized that many sustainability issues, including those pertaining to end-of-life scenarios, require consideration from three different ethical viewpoints: economic, social, and environmental. There are many MCDM tools available which have been developed and used to approach problems and decision-making from each of these viewpoints, life-cycle costing (LCC), social



accounting, and environmental life-cycle assessment (LCA), to name a few. Figure 3 presents a sample diagram of what might be considered in an environmental LCA of collection disposal. Such a single viewpoint approach does not adequately address the diversity of issues and impacts of collection disposal as revealed in the interviews. There are efforts to use all three disciplined approaches in single studies to bring these standpoints together. This occurs with the integration of different methodological tools in full, or in part; the parallel execution of different tools; or the use of LCA within a greater methodological process (Colodel, Kupfer, Barthel, & Albrecht, 2009; Norris, 2001; Staikos & Rahimifard, 2007).

Figure 3: Life-cycle assessment: environmental impacts of media disposal

Social and economic LCA tools are also beginning to be explored that might be used in parallel with environmental LCA. These other tools follow the framework of environmental LCA and might be combined to include all three viewpoints, presenting more internal consistency than when different methodological tools are used together (Jorgensen, Le Bocq, Nazarkina, & Hauschild, 2008). Further to this, new life-cycle and decision-making tools, such as SEEBalance and AEOLOS, have been developed which fold each of these areas into single, specifically designed tools (Bufardi, Sakara, Gheorghe, Kiritsis, & Xirouchakis, 2003; Schmidt et al., 2004). However, it is readily apparent that social impacts are significantly different than environmental or economic ones; in character and in how they might be measured, requiring specifically tailored methodology (Dreyer, Hauschild, & Schierbeck, 2010; Jorgensen et al., 2008).

3.3 Life-Cycle Assessment

Life-cycle assessment presents itself as an appropriate MCDM tool to begin to examine collection disposal. One of the benefits of LCA is that there is an implicit consideration of context and holistic system view. Without looking at the context a product, process, or service operates in, very different impacts can be revealed. Areas of improvement revealed by this method include prevention and are not restricted to damage control. In this way, life-cycle thinking enables problem-shifting to be identified and anticipated which, given the complex nature of information media, is a recognized issue both inside and outside the library (Briscoe, 1991; Hirschier & Reichart, 2003; Levinson, 1998; Rickert, 2001; Schmidt et al., 2004).

Traditionally, LCAs can be resource intensive. Life-cycles are progressively complex when examined at a high level of detail to include all inputs and outputs requiring rigorous quantitative data. Indeed, it is understood that no single LCA can possibly produce an assessment that fully represents a complete life-cycle (Hochschorner & Finnveden, 2003). In the case of libraries it is unlikely that such detailed studies would be possible, let alone practical, to integrate into existing responsibilities.

It is recognized that there is a need for LCA methodologies that do not require such an exhaustive approach. Streamlining can ensure the feasibility of a study and allows LCA to be suitable to more application scenarios (Bala, Raugei, Benveniste, Gazulla, & Fullana-i-Palmer, 2010; Schmidt et al., 2004; Tolle, Evers, Vigon, & Sheehan, 2000). Even when simplified, streamlined LCAs can provide results consistent with full LCAs and are suggested to be used when identifying problems or areas of improvement (Hochschorner & Finnveden, 2003; Jorgensen et al., 2008; Staikos & Rahimifard, 2007). In addition some streamlined Environmental LCA tools allow for the inclusion of additional qualitative information and so there is potential to cover social and economic issues as well (Hochschorner & Finnveden, 2003; Jorgensen et al., 2008).

3.4 Modified MECO Model

The context, characteristics, and impacts of library collection disposal, as revealed by the experiences in Alberta, present several factors which can be used to determine the appropriate application of an MCDM methodology regarding collection disposal. Libraries may be short on resources, expertise, and data availability to conduct full scale studies and would require a multiple viewpoint approach to fully address the variety of impacts associated with collection disposal.

Sustainable collection management and disposal can be informed by drawing from a life-cycle approach in light of information media interaction and evolution and dynamic changes to library contexts as is used in LCA methods (Bufardi et al., 2003). In addition, the streamlined approaches offered by LCA allow feasible studies to be conducted given restrictions and can potentially accommodate environmental, social, and economic issues.

The MECO model is a streamlined LCA approach where information about the environmental impacts of a product is placed in four categories over the different life-stages of the product (Pommer et al. in Hochschorner & Finnveden, 2003). These categories allow for both qualitative and quantitative information regarding the materials, energy, chemicals, or other areas involved in a life-cycle and is where the MECO name is derived (Wensel et al. in Hochschorner & Finnveden, 2003). The MECO approach is unique compared to other streamlined approaches in that qualitative data may be used to

supplement or stand in for quantitative data and that it offers a complimentary approach to a full LCA and can achieve similar results (Hochschorner & Finnveden, 2003).

Although the MECO model has many aspects making it suitable to this context it still must be modified in order to be best suited for a collection disposal decision-making application. Table 1 illustrates a potential modification to matrix categories and life-stages (modifications are highlighted). Normally, the ‘Other’ category is used to capture environmental impacts not covered by the other categories and life-stages used are quite general, covering Material, Manufacture, Use, Disposal, and Transport. In this respect the MECO model is not very appropriate for the collection disposal context. However, the structure of this model lends itself to the consideration of non-environmental impacts and more specific life-stages. The ‘Other’ category can provide a place where social and economic impacts might also be described. Likewise, life-cycle stages can be removed and supplemented to reflect the specific context of collection disposal in the library and describe a particular disposal method in greater detail. The chart can be made to focus on those stages after deselection, as in table 1, or added to bringing the impacts of acquisition and circulation into view as well.

		Media Preparation	Storage	Transport	End-of-Life (as library material) Scenario
1. Materials	a) Quantity b) Resource				
2. Energy	a) Primary b) Resource				
3. Chemicals					
4. Other	a) Social i) Library workers ii) Library users iii) Others b) Economic i) Costs ii) Benefits				

Table 1: Modified MECO matrix

4. Conclusion

Of those Alberta library professionals interviewed none were able to clearly express how much impact collection disposal had on the library, the community, or the environment, though all were aware that it did. A simplified LCA framework can be used in collection management and disposal to address many of the concerns and negative impacts raised in the interviews. Such a framework can assist in identifying problem areas and areas of improvement; establishing baselines for measuring improvements and changes to collection dynamics; informing policy development; as well as creating management action plans by modelling *what if* scenarios.

It cannot be known where problem areas exist without beginning to measure and identify attributes of the system in question. This profiling creates a baseline of the flow of material from which the true cost of collection disposal might be measured. This then changes impacts of disposal from being accepted costs of doing business to costs that can be managed and improved. Being able to compare or predict future scenarios with meaningful measurement allows management to be pro rather than re-active.

There are many what if scenarios that can be considered for collection disposal. These can involve changes to contexts brought about by the library or external actors. What ifs might include areas involving material purchasing, how impacts of collection disposal would change if extended producer responsibility (EPR) was provided for all information media found in libraries, not just computers, and specific licensing purchased so all formats could be sold and donated; the physical qualities of materials, how the design of information media has the potential to create higher value material commodities upon disposal; and approaches to final disposal, collection disposal could be used to start discussion in the community about the consumption and disposal of information media or a regional disposal network between libraries, where resources are already pooled for acquisition, to reduce impacts. Further understanding brought about from this approach ensures that acquisition and circulation might be conducted to mitigate potential impacts at the end of the library life-cycle.

Developing the concept of collection sustainability requires consideration of all aspects of collection management and the concerns of library and information workers. Beginning by considering collection disposal, life-cycle thinking can provide a perspective with which to reveal sustainability issues that have direct impacts on libraries, users and society. In turn, streamlined LCA methods can provide the information and tools that will allow collection sustainability to be managed in a meaningful and successful way. Beyond benefiting libraries in their day to day operations, such a view on collection sustainability ultimately enables the library profession to manage collections consistently with core social responsibilities.

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