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Preservation of Electronic Records: New Knowledge and Decision-making

La préservation des documents électroniques : Information récente et prise de décisions



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Foreword

The preservation of electronic records is one of the latest challenges facing the conservation and heritage communities. It is a complex and multifaceted task that includes content, media, hardware, and software.

The program for *Symposium 2003 - Preservation of Electronic Records: New Knowledge and Decision-making* was developed to deal systematically and logically with the various issues. The organizing partners — the Canadian Conservation Institute (CCI), Library and Archives Canada (LAC), and the Canadian Heritage Information Network (CHIN) — all have extensive experience in the field of electronic record preservation, and each brought a unique perspective on specific aspects of the topic.

But the challenge of preserving electronic records extends well beyond the traditional heritage community. It really includes all custodians of electronic information — from corporations to government agencies to individuals. To meet this need, the symposium also included a separate half-day event for the general public.

The organizing partners were delighted to welcome more than 350 delegates to the symposium; of these, 85% were from Canada, 10% from the United States, and the rest from a variety of countries including Australia, Bermuda, the Cayman Islands, Cuba, France, Italy, Malaysia, Mexico, the Netherlands, New Zealand, Taiwan, and the United Kingdom. Everyone participated actively in the discussions, and returned to their institutions with not only a better understanding of the challenges but also with viable and practical solutions that can be implemented immediately.

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Avant-propos

La préservation des documents électroniques compte parmi les plus récents défis que doivent relever les collectivités de la conservation et du patrimoine. Cette tâche complexe concerne de nombreux éléments tels que le contenu, les médias, le matériel et les logiciels.

L'objectif du programme du *Symposium 2003 – La préservation des documents électroniques : Information récente et prise de décisions* est de se pencher systématiquement et logiquement sur les divers enjeux. Les organisateurs partenaires – l'Institut canadien de conservation (ICC), Bibliothèque et Archives Canada (BAC) et le Réseau canadien d'information sur le patrimoine (RCIP) – possèdent tous une vaste expérience de la préservation des documents électroniques, et chacun d'entre eux apporte un éclairage unique à des aspects précis de la question.

Mais le défi que représente la préservation des documents électroniques dépasse de loin la collectivité du patrimoine. Il inclut en fait tous les détenteurs de renseignements électroniques – des sociétés aux organismes gouvernementaux, et jusqu'aux particuliers. En vue de satisfaire ce besoin, une activité d'une demi-journée à l'intention du grand public fut présentée dans le cadre du symposium.

Les organisateurs partenaires ont été ravis d'accueillir plus de 350 participants, dont 85 % venaient du Canada, 10 % des États-Unis et 5 % de divers pays y compris l'Australie, les Bermudes, les îles Caïmans, Cuba, la France, l'Italie, la Malaisie, le Mexique, les Pays-Bas, la Nouvelle-Zélande, Taïwan et le Royaume-Uni. Tous ont pris part activement aux discussions, et tous sont retournés dans leurs établissements avec non seulement une meilleure compréhension des défis à relever, mais également avec des solutions pratiques qu'ils seront en mesure de mettre en œuvre sur-le-champ.

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Library and Archives Canada
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Government Services Canada
Tunstall & Tunstall Data Recovery Services

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L'Institut canadien de conservation
Le Bureau de la traduction, Travaux publics
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Le ministère du Patrimoine canadien
Le Musée canadien des civilisations
Le Musée des sciences et de la technologie du Canada
Le Réseau canadien d'information sur le patrimoine
Le studio des enregistrements sonores de la Division
de la musique (Bibliothèque et Archives Canada)
Le Trust pour la préservation de l'AV
Tunstall & Tunstall Data Recovery Services
The Willow Group

Preface

Symposium 2003 - Preservation of Electronic Records: New Knowledge and Decision-making took place in Ottawa on September 15–18, 2003, with a program that took the form of a decision tree. Following this format, the sessions could focus on areas that related to each other in a structured manner and all the key issues relating to the preservation of electronic records could be introduced in a logical sequence from the opening to closing speakers. The topics discussed included not only storage media but also the issues that must be addressed before considering how long an electronic record will last. [For the purpose of this symposium, the term “electronic record” was used to describe a large variety of records, e.g. audio and video recordings in analog or digital form and data files such as text, spreadsheets, e-mails, etc.]

The decision tree was initially formulated by the Program Committee, but refined by Tom Strang from CCI and Bruce Walton from LAC. Addressing the key decisions/choices that an institution needs to make when considering the acquisition and preservation of electronic records led to five main session categories: Appraisal of Electronic Records; Authenticity of Electronic Records; Developing a Preservation Strategy for Electronic Records; Preservation Strategies for Electronic Records; and Media Knowledge. The call for papers clearly outlined this approach, and resulted in the submission of more than 45 abstracts. Because of the decision tree program structure, the process to select the papers was very specific. The final program consisted of 29 papers from 6 countries: Canada (14); United States (8); Australia (3); United Kingdom (2); France (1); and Germany (1). In addition to the main program, 4 posters that fit into the program structure were also presented (1 from Canada, 2 from the United States, and 1 from France).¹

Another objective of the program was to feature a wide variety of small- to medium-sized institutions that included not only archives and libraries, but also cultural institutions such as art galleries and museums that are faced with preserving electronic records. For example, art galleries often include video art in their collections, but the needs of these electronic records are quite different than the needs

1. One of the posters that was presented at the symposium was the decision tree that appears on p. 2 of the “Introduction” of this book of postprints. Hence, only three abstracts are included in the “Posters” section.

Préface

Symposium 2003 – La préservation des documents électroniques : Information récente et prise de décisions a eu lieu à Ottawa, du 15 au 18 septembre 2003, avec un programme qui a pris la forme d’un arbre de décision. Selon ce format, les séances pouvaient porter sur des sujets liés entre eux de façon structurée et tous les points importants concernant la préservation des documents électroniques pouvaient être présentés logiquement, du premier au dernier conférencier. Les sujets discutés incluaient non seulement les supports de préservation, mais aussi les questions à traiter avant de se demander quelle est la durée de vie d’un document électronique. [Nota : Pour les fins de ce symposium, le terme « document électronique » a été utilisé pour désigner un large éventail de documents, comme les enregistrements audio et vidéo sous forme analogique ou numérique et les fichiers de données tels que les textes, les tableurs, les courriels, etc.]

L’arbre de décision a d’abord été formulé par le comité du programme et raffiné ensuite par Tom Strang, de l’ICC, et Bruce Walton, de BAC. Les choix les plus importants que doit faire une institution et les décisions clés qu’elle doit prendre au moment de penser à l’acquisition et à la préservation des documents électroniques ont mené à l’établissement de cinq catégories principales de séances : Évaluation des documents électroniques; Authenticité des documents électroniques; Élaboration d’une stratégie de préservation des documents électroniques et Connaissance des supports. Cette approche a été soulignée dans la demande de communications, et plus de 45 résumés ont été soumis. Grâce à la structure du programme en arbre de décision, le processus de sélection a été très précis. Le programme final a consisté en 29 communications représentant six pays : le Canada (14); les États-Unis (8); l’Australie (3); le Royaume-Uni (2); la France (1) et l’Allemagne (1). En plus du programme principal, quatre affiches qui cadraient avec la structure du programme furent également présentées (une du Canada, deux des États-Unis et une de la France).¹

Un autre objectif du programme consistait à présenter une grande variété de petites à moyennes institutions possédant non seulement des archives et des

1. Une affiche présentée au symposium portait sur l’arbre de décision qui apparaît à la page 2 de l’introduction du présent ouvrage. Par conséquent, seules trois affiches font partie de la section sur les affiches.

of the electronic records typically found in archives and libraries. Thus, the speakers list included several individuals from the museum and gallery communities.

Finally, it was important that the program include some case histories that highlighted what various institutions have actually done or are doing to preserve electronic records. While discussing preservation strategies is important, seeing strategies actually being implemented and working in the real world provides useful information and models to follow. Among the case histories presented were the preservation of audio language recordings from Aboriginal elders in the Northwest Territories in Canada, the preservation of American poet Robert Creeley's computer files, and the implementation of the Victorian Electronic Records Strategy (VERS) within the Government of the State of Victoria, Australia. The case histories were arguably the most useful aspect of a program that included something for everyone.

As a whole, the program provided delegates with a sense of the broader issues involved in collecting and preserving electronic records, as well as knowledge about the challenges that other institutions are facing and how they are dealing with them.

We are pleased to present the papers from the symposium program in this book of postprints. However, because speakers were given the opportunity to revise their papers after the symposium and the final submissions were lightly edited, the text herein may differ slightly from the original presentations.

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Richard Green, LAC
Joe Iraci, CCI
Mary Murphy, LAC
Patricia Young, CHIN

Note: The papers in this book are published in the language in which they were presented, but all include an abstract in both English and French.

bibliothèques, mais aussi des institutions culturelles telles que des musées qui doivent conserver des documents électroniques. Les musées, par exemple, incluent souvent de l'art vidéo dans leurs collections, mais les besoins de consultation de ces documents électroniques sont bien différents de ceux qu'on retrouve habituellement dans les archives et les bibliothèques. Ainsi, la liste des conférenciers comprenait plusieurs personnes du monde muséal.

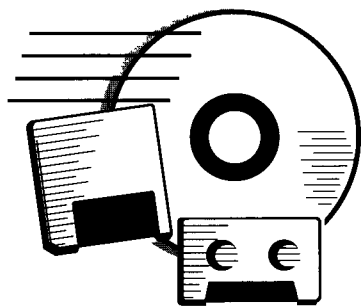
Enfin, il était important de retrouver dans le programme des histoires de cas afin d'illustrer ce que diverses institutions ont fait ou font concrètement pour préserver leurs documents électroniques. La discussion des stratégies de préservation est certes importante, mais le fait de connaître des stratégies qui sont mises en œuvre et qui fonctionnent dans une situation réelle permet d'obtenir de l'information utile et d'avoir des modèles à suivre. Parmi les cas décrits, il y a eu la préservation des enregistrements sonores des aînés autochtones des Territoires du Nord-Ouest, au Canada, la préservation des fichiers informatiques du poète américain Robert Creeley et la mise en application de la stratégie VERS pour les documents électroniques de l'État de Victoria, en Australie. On peut soutenir que les cas présentés formaient l'aspect le plus utile d'un programme répondant aux attentes d'un grand nombre de participants.

En général, les délégués sont repartis avec une vue d'ensemble des grandes questions liées à la collection et à la préservation des documents électroniques de même qu'une connaissance des problèmes auxquels se heurtent d'autres institutions ainsi que de leur manière de les résoudre.

Nous sommes fiers de vous présenter les communications du symposium dans cet ouvrage. Cependant, étant donné que les conférenciers ont eu l'occasion de modifier leurs textes après le symposium et qu'ils ont été légèrement révisés, il est possible que les textes soient quelque peu différents de ceux présentés durant le symposium.

Jane Down, ICC
Richard Green, BAC
Joe Iraci, ICC
Mary Murphy, BAC
Patricia Young, RCIP

Remarque : les communications sont publiées dans la langue utilisée lors de la présentation, mais toutes sont accompagnées d'un résumé en français et en anglais.



INTRODUCTION: CHOICES AND DECISIONS

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Abstract

This conference is aimed at helping small- to moderate-sized collections of “modern media” to survive, and is based on both practical institutional experience and current research. The program is designed around a decision tree that organizes the theoretical process, working-knowledge, and content gaps into a visual path. There are three main sections: the appraisal and pre-acquisition phase; the region entangled by the nature of physical collections; and the conceptual space where the future accessibility for information is decided. The splitting of content from carrier is a useful concept for information theorists, and is a major difference from traditional collections. Answering the question “What form could you accept for preserving your information while retaining its validity?” is the practical side of this conceptual split, and many institutions would be happy with a suitable answer to this question. There are three aphorisms that encapsulate this practical side of modern media preservation: move it or lose it; something is better than nothing; and don’t throw away the original. Although there is already a spectrum of possible means to the goal of preserving authentic objects for long periods, the hazards and benefits associated with these approaches need to be determined and explained before achievable preservation plans can be proposed and chosen. Modern media collections are in jeopardy of malfunction before stable societies have traditionally expected to lose material heritage. The decision tree on which this symposium is based is offered in the spirit that it will be news to some that informed choices can be made to carry this modern media heritage forward through time.

Introduction

Many small- to medium-sized institutions are currently facing a problem in regards to their holdings of electronic records: how can they keep their collections accessible in the face of technology

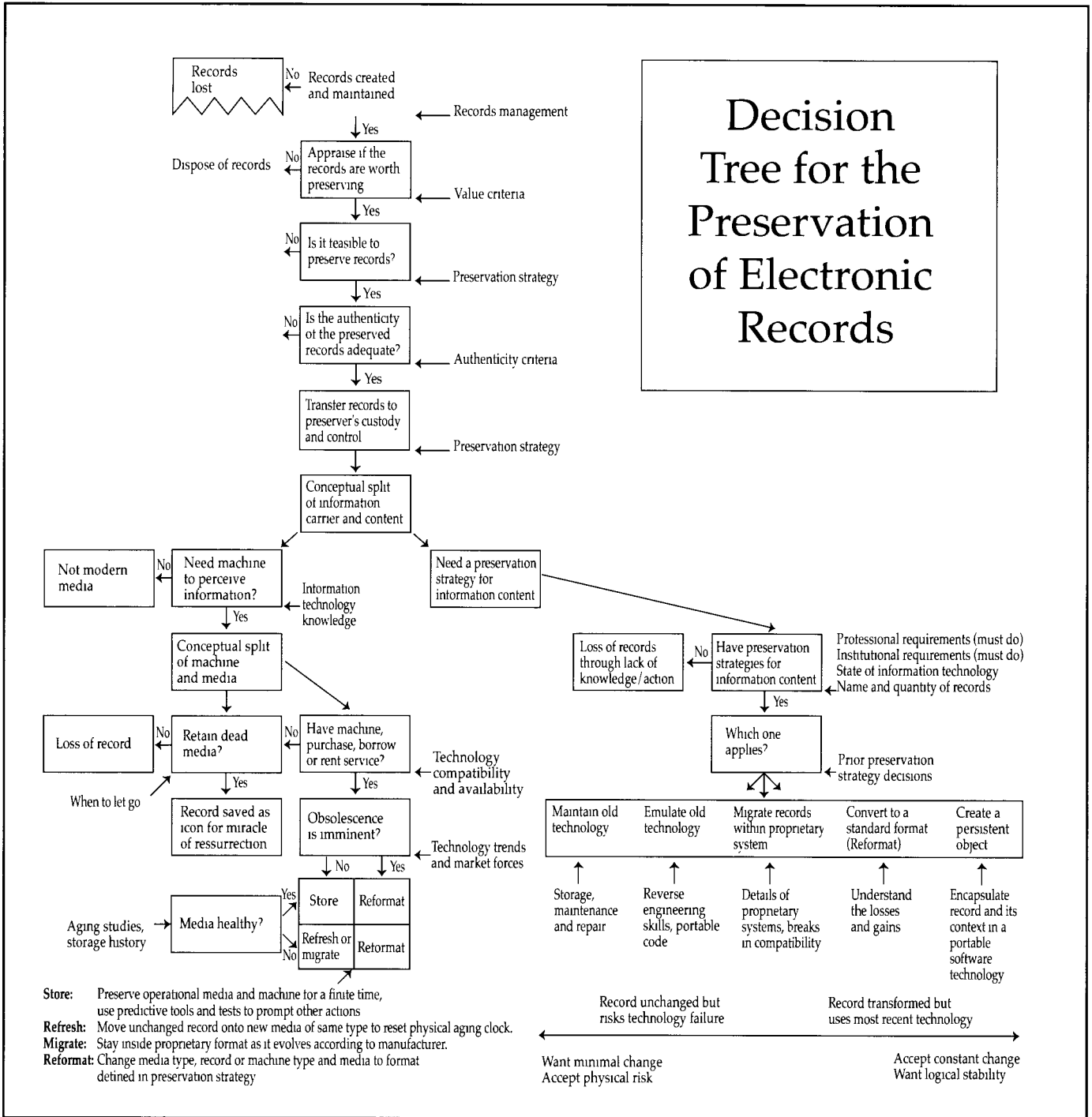
that is quickly becoming obsolete and information carriers that are rapidly deteriorating in storage conditions that seem benign. In many cases, these institutions are only beginning to come to grips with this problem as the volume of their material rapidly increases. And if the diverse history of audio and video is not enough, personal computers have contributed the final straw.

From 1999 to 2003, the Canadian Conservation Institute (CCI) ran workshops across Canada on modern information carriers in an attempt to relate the fragilities and strengths of optical disc media and magnetic tape to the archives community. The inexorable deterioration of magnetic media at ambient conditions was a message that was new to many participants. But beyond our material-centric approach, many real-world questions were asked: How do you preserve a videographer’s lifetime of work on aging tape? Is transfer to MPEG and DVD an answer or a further problem? How do you help a small archive who is receiving electronic records in forms that span across several generations of obsolete computers? Is migration from audio tape to “Red Book” audio CD the best preservation strategy? Of the many questions asked, only a few could be answered.

The preservation community (a term that is meant to include archives, libraries, and museums) has naturally made progress in these areas and has some solutions for preserving modern information. This symposium is being offered by CCI and Library and Archives Canada (LAC) to provide a venue for this community to come together and discuss the topic.

The decision tree

The decision tree was developed by the symposium program committee (with special thanks to Bruce Walton, LAC) to serve as the backbone for organizing the program. With this structure in mind, the Call for Papers was then designed to elicit papers on the specific knowledge areas identified on the tree.



To assist in referencing to their content, contributed papers are grouped by their region within the tree. Beyond this immediate use, the tree was intended to serve as a simple document to convey the wider picture of the process used and attendant knowledge needed when preserving a modern information collection. Intellectually, the decision tree also owes

a fair amount to the InterPARES project,¹ but in tree form it is not intended to be as comprehensive in detail. The tree has subsequently become a discussion piece for many of CCI's workshops on modern information carriers; participants have used it to elaborate on their approach to acquiring and managing electronic media records and problems that arise.

1. The InterPARES (International Research on Permanent Authentic Records in Electronic Systems) project was a collaborative, multidisciplinary, and international research endeavour that involved 60 researchers from 11 countries. Its aim was to develop the theoretical and methodological knowledge necessary for the long-term preservation of the authenticity of electronic records.

The tree settled into three main regions graphed as an inverted Y. The upper branch covers the process of appraisal for preservation and acquisition. Potential collections are winnowed by the desire to preserve (value), and the methods and resources to preserve. This is a two-pass filter: "If we can preserve it, we can collect it" is the major threshold; and once the decision is made to collect the material, the actual process (preservation strategy) can be enacted as envisioned. This is opposed to the alternate approach of "collect it and hope we can preserve it someday." The knowledge areas required are value criteria, preservation strategy, and authenticity criteria, and subsequent papers in this symposium reflect these areas.

The lower branches relay the conceptual split between carrier and content. The nature of electronic media, and especially the possibility of digital representation, allows one to think in terms of disembodied "information streams." However, the hard truth is that these lumps of information must reside somewhere and be maintained, searchable, and accessible; otherwise all this effort is not worthwhile. In some sense the two branches represent the way things are and the way they could be. At best, they are what you've got and what you want. At worst, they are all you've got and a constant frustration.

The leftmost branch shows basic requirements for keeping machine-readable records available for reference. While generally suggesting forestalling actions against loss, this area encapsulates in a two-by-two matrix the (minimum) possible preservation actions based on the idea of relative media and machine health. The definitions of store, refresh, migrate, and reformat are provided because these terms are jargon associated with specific choices. The knowledge areas required to make decisions about priority in processing include general recognition of media technologies, technology compatibility and availability, technology trends and market forces, aging studies, and storage history of media.

The rightmost branch follows the preservation strategy, and terminates in the spectrum of choices that have been suggested in the left branch matrix. The preservation strategy is the forward path for the collection and can entail transformation of the existing record, deliberate transcription from the acquired media, and departure from original hardware to a new corpus. This is not so difficult to envision for electronic text because we are already

accustomed to viewing texts in various formats — and all are ultimately legible. But the discussion about digital forms for analog sources is a more gnawing one because we must lose some information in the sampling. So the choices are presented as a spectrum flowing from desiring minimal change but having to accept physical risk by deterioration, toward the methods that accept constant corporeal change but maintain stable and recognizable authentic records in some logical form.

In the course of CCI workshops, we have reduced the entire process into three discussion-challenging aphorisms:

- "Something is better than nothing" evokes the inherent stress of selection for preservation, and grudging acceptance of sampling analog originals as a preservation mechanism by digital means.
- "Move it or lose it" captures the urgency of some situations, and affirms the pragmatism of something being better than nothing.
- "Don't throw out the original" is our caveat. Competent transfer of "born-digital" text can safely end in disposal of the old media. Rarely are the creation of digital collections for the purpose of access confused with preservation strategies, but we want to ensure these are distinguished as different processes. Of most concern is that the choices for preservation formats are still in flux within the area of audio and especially video records. We want to ensure that the original survives to its "natural" time with extension by good storage conditions, rather than being discarded prematurely only to wish we could go back and resample.

We hope the decision tree has some lasting value as a tool for the creation of preservation strategies for modern information carriers in small- to medium-sized collections — even if only as a stepping stone to greater comprehension.

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Résumé

Le Symposium a été conçu pour aider les établissements responsables de petites et moyennes collections de « médias modernes » à survivre. Il est fondé à la fois sur une expérience institutionnelle pratique et sur les recherches actuelles. La création d'un arbre de décision permet l'organisation en un schéma visuel du processus théorique, des connaissances pratiques et des lacunes sur le plan du contenu. Le programme du Symposium a été élaboré en fonction d'un diagramme de ce genre. Les trois principales sections sont les suivantes : l'étape de l'évaluation et de la pré-acquisition, celle de la nature des collections physiques, et l'espace conceptuel où l'accessibilité future de l'information est déterminée. La séparation du contenu de son support constitue un concept utile aux théoriciens de l'information, ainsi qu'une différence majeure par rapport aux collections traditionnelles. Répondre à la question : « Quelle forme êtes-vous prêt à accepter pour préserver votre information tout en conservant sa valeur? », c'est le côté pratique de cette division conceptuelle. Nombreuses sont les institutions qui aimeraient avoir une bonne réponse à donner à cette question. Trois formules rendent compte de l'aspect pratique de la préservation des médias modernes : « À transférer ou à abandonner », « Vaut mieux garder quelque chose que de se retrouver avec rien », et « Ne jetez pas l'original ». À l'heure actuelle, nous reconnaissons une gamme de moyens possibles de préserver des objets authentiques à long terme. Les risques et les avantages liés à ces méthodes doivent être précisés et expliqués, de manière à ce que des plans de préservation réalistes puissent être proposés et choisis. Les collections de médias modernes sont en danger de défaillance, et ce, bien avant le moment où les sociétés stables s'attendent habituellement à perdre leurs biens patrimoniaux. Cet arbre décisionnel est proposé dans l'intention d'apprendre à ceux qui l'ignorent qu'il est possible de faire des choix éclairés afin de préserver ce patrimoine pour les générations futures.