

**STRUCTURING THE FIELD(S):
USER-GENERATED TAGS AND THE ARCHIVE
AT CBUT VANCOUVER**

by

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Abstract

This thesis explores the potential conflict between user-generated tags and traditional archiving practices in the broadcasting industry.

Changing technological configurations in the field of television news often have unforeseen consequences. The installation of a digital video server at Canadian Broadcasting Corporation Vancouver Television in 2007 has the potential to shape the process of accessioning records used by the media librarians by creating new possibilities for the collection of tags throughout the production process.

The current information architecture consists of a data structure and a set of practices that combines descriptive metadata constructed by media librarians with automatically generated metadata gathered from the production process. Allowing user-generated data in the form of descriptive tags attached to media assets to pass through to the information architecture has the capacity to destabilize the existing taxonomy of controlled terms used by the librarians. Any move towards allowing tags into the system should proceed with extreme caution.

Keywords: Taxonomy; folksonomy; CBUT; field; archives; journalism

*For Nicole and Shaela
who patiently waited for this to be finished.*

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List of Abbreviations

AMIM2	Archival Moving Image Materials, version 2 Cataloguing Rules
AACR2	Anglo-American Cataloguing Rules, 2nd edition, 2002 revision
ANT	Actor-Network Theory
BBC	British Broadcasting Corporation
CBC	Canadian Broadcasting Corporation
CBUT	Canadian Broadcasting Corporation VancoUver Television
CNN	Cable News Network
CSDGM	Content Standards for Digital Geospatial Metadata
DAM	Digital Asset Management
FGDC	Federal Geographic Data Committee
IEEE	Institute of Electrical and Electronics Engineers
IPTC	International Press Telecommunications Council
MARC	MAchine-Readable Cataloguing Codes
MIC	Moving Image Collections
SMEF	Standard Media Exchange Framework
W3C	World Wide Web Consortium
VRA	Visual Resources Association

Glossary

<i>Authority File</i>	A list of the authoritative forms of the headings used in a library catalog or file of bibliographic records, maintained to ensure that headings are applied consistently as new items are added to the collection. Separate authority files are usually maintained for names, uniform titles, series titles, and subjects. All the references made to and from a given heading are also included in the file (Reitz, 2004, p. 53).
<i>Boolean Search</i>	A search using Boolean logical expressions (AND, OR, NOT, and XOR) (Reitz, 2004, p. 98).
<i>Controlled Vocabulary</i>	A list of terms or names that cluster variants of a term or name around a preferred heading. In broadcasting, controlled vocabularies can most often be found supplying authorized terms for proper nouns, genres, subjects, and media formats (Reitz, 2004, p. 177)
<i>Data Model</i>	A data model represents the data definitions and business logic rules that determine the relationships between items and groups of data (Cox, Tadic, & Mulder, 2006, p. 38).
<i>Data Rules</i>	Data rules define the structuring of the data within a particular field (Cox et al., 2006, p. 8). The practice of entering surnames or family names first is an example of the application of a data rule.
<i>Data Values</i>	Data values are the actual content of a particular field or data element (Cox et al., 2006, p. 9).
<i>Folksonomy</i>	An ordered set of categories that emerge from how people tag items (Smith, 2008, p. 14).
<i>Granularity</i>	Refers to the level of refinement of a given schema or scheme (Reitz, 2004, p. 320).
<i>Metadata</i>	Refers to any data that aid in the identification, description and location of networked electronic resources. A primary function of metadata is resource discovery: metadata increases the odds that a user will be able to retrieve appropriate information and assess its usefulness and availability. Another important function provided by metadata is control of the electronic resource, whether through ownership and provenance metadata for validating information and tracking use; rights and permissions metadata for controlling access; or content ratings metadata, a key component of some Web filtering applications (Hudgins, Agnew, & Brown, 1999, p. 1)
<i>Metadata Scheme</i>	A collection of metadata elements or fields that: support a function or a series of functions for an information object, form a structured container to which data values are added, and have their attributes formalized in a specified format (Greenberg, 2005, p. 24).

<i>Nomenclature</i>	A system or set of terms or symbols especially in a particular discipline or art (Reitz, 2004, p. 713).
<i>Taxonomy</i>	An organized collection of data. Often arranged into a tree structure with a parent object at the top and increasing numbers of children added at each level (Smith, 2008, p. 67).
<i>Thesaurus</i>	A thesaurus is similar to a dictionary but associates items with synonyms (Cox et al., 2006, p. 54).

1. Introduction

Canadian Broadcasting Corporation Vancouver Television (CBUT), the Vancouver branch of the Canadian Broadcasting Corporation, has been airing nightly television news since 1953. Since its inception the social, cultural and technological environment of the archive has shifted significantly. The history of these changes has been recorded in the content and form of the CBUT media library, the site of a comprehensive collection of radio and television content contained in tens of thousands of reels, cassettes and discs¹ and the accompanying archival records. The library is a rich storehouse of textual, acoustic and visual records about life and the way it was covered in the news in the Lower Mainland and the province of British Columbia over the past half century.

The technology involved with obtaining, organizing, disseminating and archiving news content has undergone frequent change since the beginning of television. Subtle or even seemingly insignificant shifts in any part of the process can be accompanied by corresponding shifts throughout the whole of the production chain. Studies of the journalistic field often focus on bias and framing as exclusively human phenomena, without considering how changing technologies affect access to information in ways that shape news reporting, and consequently our understanding of connections between today's news and the past. The day-to-day work of news reporting is a creative process, involving self-determined actors interacting with constantly evolving technological and information systems. Searching through archival data fields for material to support reporting and illustrate news stories is an important component in the development of news reports. How has access to yesterday's news shaped and been shaped by changing archival practices? How did those data fields come into being?

¹ In October 2008, the Library Coordinator, Colin Preston, estimated that there were over 30,000 cans of film, 35,000 tapes, 25,000 compact-discs and 5,000 original master 1/4" recordings in the collection.

Information infrastructures like the media library at CBUT arise to meet the needs of specific communities of practice (Bowker & Star, 2000, p. 35). Over the years the community of users of the broadcast archives has grown increasingly diverse. Correspondingly, the archival system has evolved as a structure to meet the needs of a changing user base. Without structure large collections of data become useless, it becomes impossible to find and retrieve material. On the other hand, a disconnect between a community of users and an archival system can occur if terms and categories are imposed in a top-down fashion without feedback or input. A controlled thesaurus² constructed at a national level, for example, might not allow for the subtle nuances of a regional or local vernacular. The search and retrieval of relevant archival resources is maximized at a balancing point of fixity and fluidity in the system (Wright, 2007, p. 235). This point shifts over time depending on the characteristics of the user base being served.

New technologies and interfaces that access networked databases have engendered a fundamental shift in the organizational structure of information. On some systems users can not only access data in new ways but also contribute their own user-generated data. Read-only entities like the *Encyclopedia Britannica* are being abandoned in favour of interactive upstarts like Wikipedia that grant users both read and write privileges. Information systems are serving increasingly divergent groups of users at the same time as traditional data structures are giving way to entirely new paradigms.

In September 2007 CBUT Vancouver implemented a massive shift of technical infrastructure. This involved the installation of a digital video server with a corresponding shift in workflow and practice. Previously, the entire production flow from shooting, to editing, to broadcasting and archiving was conducted using analog tape. The addition of a digital video server allows for an entirely different workflow. While source footage is still being shot on analog tape, the tapes are now being digitized and ingested into the server. Editing takes place using non-linear editing software³ with source clips held on the server. A team of archivists works through the material on the server on a daily basis

² A definition of this term and many others used in the thesis can be found in the glossary.

³ Non-linear editing systems were used previously for documentaries and special reports but not for the nightly news items.

extracting clips appropriate for archiving. This material is then recorded back to analog tape for long-term storage.

The switch to a server-based workflow has the potential to radically alter the information architecture at CBUT Vancouver. For example, it allows for new ways to collect user-generated data. In some local television stations operating in the lower mainland material is already archived almost exclusively with user-generated data. The collection and use of information entered by customers of the online bookstore Amazon, for example, is often held up as a powerful and empowering model of the future (Weinberger, 2005, p. 62). The ability to *tag*⁴ entries with keywords allows an emergent classification system to develop (Wright, 2007, p. 234). The term “folksonomy” is used to describe the process through which sets of categories emerge from user’s tags (Weinberger, 2005, p. 165). This can be contrasted with a traditional taxonomy where categories are constructed by information architects like archivists and librarians.

In the larger scheme of things why does the structure and content of data fields matter? At the core of the issue lies the ability to control the contents of data fields used in electronic databases. News content, and the accompanying social and political power of the field of television journalism, is increasingly being managed using the fields contained in networked databases. The structure of data fields has the potential to shape the content of the news, the field of television journalism, and consequently, our understanding of past and present realities.

A tension exists between traditional top-down taxonomic information systems and emergent, bottom-up folksonomies. This thesis explores some of the potential ramifications of the struggle between competing classification systems for the broadcasting archive at CBUT Vancouver and its users. It presents the argument that the archival needs of television journalism are best served by a taxonomic data system maintained by dedicated professionals. Chapter 2 builds towards an understanding of the structure and organization of data fields from an Information Science perspective. Chapter 3 continues with a brief outline of academic studies of the field of journalism in order to highlight the lack of attention given to technical change in studies of journalism

⁴ A tag is a keyword or descriptive term added by a user (Smith, 2008, p. 5).

and news reporting. In Chapter 4, I discuss the research design and the rationale for the particular methods employed in this study. Chapter 5 presents the observations made at CBUT over the course of the study with references to print and audio-visual material contained in the appendices. These observations are then analysed in Chapter 6 with the conclusion that it is possible for aspects of a folksonomy to be incorporated into a traditional information architecture but that this must proceed with extreme caution to prevent damage to currently functioning systems.

2. Data Fields in Television Archives

2.1. Introduction

The growth of digital collections of multi-media materials has triggered a massive interest in the development of effective information storage and retrieval systems. Desktop computers provide access to digital files stored on networked servers for multiple users separated in time and space (Cox, Tadic, & Mulder, 2006, p. 4). This allows for potential changes in workflow as well as new patterns of media creation and consumption. Broadcasters are motivated to implement new technologies by economic considerations (Austerberry, 2006, p. 64). On the one hand, they seek to implement new information management strategies for the purposes of efficiency. Better search and retrieval capabilities result in reduced turnaround time on projects, less errors in content, and better communication throughout the process between all of the players involved (Austerberry, 2006, p. 64). On the other hand, new ways of repurposing content for the Internet or for external buyers provide the possibility for new and enhanced revenue sources (Austerberry, 2006, p. 64).

2.2. Information Architecture

In the world of information architecture access is provided by digital asset management (DAM) strategies. A DAM system is capable of addressing the following questions with regard to digitally stored content: what content exists, who has the rights to use it, where is it, what format is it in? According to Austerberry (2006), "...DAM provides for the sensible exploitation and administration of a large asset repository. An asset-management system provides a complete toolbox to the author, publisher, and the end users of the media to efficiently utilize the assets" (p. 5).

Digital Asset Management systems rely on the sharing of electronic information through a computer network. This allows for an increase in the overall number of agents or divergent communities of practice that could possibly use the system. The necessity

of sharing records puts pressure on system designers to ensure *interoperability* across systems. Apples need to be compared to apples and episode titles to episode titles. The Institute of Electrical and Electronics Engineers (IEEE; 1990) defines interoperability as: “the ability of two or more systems or components to exchange information and to use the information that has been exchanged” (p. 114). In other words, the data contained in fields needs to have a structure and content that allows for meaningful comparisons.

The promise of an increased return on investment through the implementation of digital workflows is premised on one foundational element—the data field. Without meaningful classification systems in clearly defined data fields accompanying multimedia collections become worthless. The word “field” used in the sense of library or information sciences refers to, “a logical unit of data that, together with other units, comprises a record in a database or other system of recordkeeping, for example, the name, address, or phone number field of each patron record in a library’s patron database” (Reitz, 2004, p. 275).

Data fields are populated with data that refer or point to other kinds of data. The term *metadata* has been adopted as a way to refer to this phenomenon. In a most basic sense, “Metadata is data about data” (Lazinger, 2001, p. 139). At first glance this quick definition seems to do the trick. In computing terminology the term *meta* is commonly used to mean *about*—it might seem that the term is self-explanatory. As it turns out, however, the use metadata is anything but simple or clear. Metadata as a general descriptive term has been overused to the point where it can mean many different things in different contexts (Lazinger, 2001, p. 139). The various terms metadata, meta data, meta-data have all been adopted by the computer science, statistical, database, and library and information science communities (Greenberg, 2005, p. 19). In the early 1990s, metadata began to be used in the sense of the information required to make computer files useful for human interaction (Caplan, 2003, p. 1). With the advent of the World Wide Web and Internet computing, the term metadata became associated with the information used to describe objects on a network. The term entered into mainstream usage with the creation and promotion of the Dublin Core Metadata Element Set in 1995 (Caplan, 2003, p. 2).

The World Wide Web Consortium (W3C) has adopted a very restrictive definition of metadata: “Metadata is machine understandable information for the web” (Caplan, 2003, p. 2). In the librarian community, however, there is debate about whether metadata should refer to both digital and non-digital resources (Caplan, 2003, p. 2). One approach for the development of a meaningful discussion of metadata, however, is to not focus on what the term can be restricted to but what the use of metadata in the particular situation can accomplish. According to Hudgins, Agnew, & Brown (1999) metadata:

...commonly refers to any data that aids in the identification, description and location of networked electronic resources. A primary function of metadata is resource discovery: metadata increases the odds that a user will be able to retrieve appropriate information and assess its usefulness and availability. Another important function provided by metadata is control of the electronic resource, whether through ownership and provenance metadata for validating information and tracking use; rights and permissions metadata for controlling access; or content ratings metadata, a key component of some Web filtering applications. (p. 1)

Metadata has been broken into various descriptive categories. While it can be argued that these kinds of distinctions are arbitrary, it is useful to think about the different ways that metadata can be employed. Gilliland-Swetland (2000, p. 3), for example, divides metadata into five distinct categories—administration, description, preservation, use, and technical. The scope of metadata usage in the current broadcasting environment is immense. In this study attention was paid to the broader pattern of metadata usage in terms of the categories given above but for the purpose of depth I have chosen to focus specifically on descriptive metadata used in the archiving process.

Interoperability is a key issue in the effective use of descriptive metadata. In the interests of interoperability system designers are forced to make sure that they adhere to certain standards and procedures. This pressure is exerted along three major lines when it comes to designing DAM: the development of standardized data schemes, rules and values (Cox et al., 2006, p. 7). A presentation of how media librarians at CBUT use data schemes, rules, and values can be found in the video clip titled “Server Based Catalog Workflow” in Appendix A.

Data values concern the actual words and numbers contained within a particular field or data element. These values can take the form of controlled vocabularies, thesauri, and lists of authorized terms, names, subjects, and genres (Cox et al., 2006, p. 9). A controlled vocabulary consists of a list of preferred terms that a cataloger must use when creating their records (Reitz, 2004). Making a controlled vocabulary available through an online thesaurus allows for greater consistency (Cox et al., 2006, p. 54). The controlled vocabulary at the Cable News Network (CNN), for example, is the size of a pair of phone books (McCargar, 2004, p. 29). The subject reference scheme set up by the International Press Telecommunications Council (IPTC) and the Newspaper Association of America was developed for the categorization of all material related to news—including text, video, animation and images (Austerberry, 2006, p. 134). The IPTC provides news exchange formats to the news industry and also creates and maintains sets of topics to be assigned as metadata values to news objects like text, photographs, graphics, audio- and video-files and streams. The IPTC NewsCodes are a controlled vocabulary that can be used to fill metadata fields. The goal is to achieve interoperability and at the same time allow for the use of a detailed and comprehensive data structure.

Values within fields are also constrained with data rules. Data rules govern the structure of data as it gets entered into an information system (Cox et al., 2006, p. 8). The practice of entering surnames or family names first is an example of the application of a data rule. As of yet there are no standardized data rules created for use in the broadcasting sector. There are, however, examples that have been created for use in the public sector: the Archival Moving Image Materials, version 2 Cataloguing Rules (AMIM2), and the Anglo-American Cataloguing Rules, 2nd edition, 2002 revision (AACR2) (Cox et al., 2006, p. 9).

The metadata contained within data fields is structured by specific data rules and values. Metadata schema, on the other hand, operate in a broader sense to structure information. Metadata elements are grouped together into a scheme. The number and character of fields are tightly controlled in the interest of interoperability. Historically, the term *scheme* has been used to describe systems used in library catalogues and other kinds of databases. Scheme is used here in the commonly understood sense as a “structured framework or plan” (Greenberg, 2005, p. 22). A metadata scheme can be

identified by three main features, a collection of metadata elements or fields that: support a function or a series of functions for an information object; form a structured container to which data values are added; and have their attributes formalized in a specified format (Greenberg, 2005, p. 24). This means that the relationships between elements and between elements and *sub-elements* or *qualifiers* are described in the schema (Slater, 2002).

Various metadata schemes have been developed for different purposes. These can be arranged along a continuum of complexity with systems like MARC (MACHINE-Readable Cataloging codes) at the complex end of the spectrum and the Dublin Core Metadata Initiative at the simpler end. The MARC standard requires significant training and high levels of expertise to be used properly. As a consequence MARC tends to be used only by specialized librarians (Lazinger, 2001, p. 157). In some ways the Dublin Core initiative was developed in response to the difficulties involved with creating MARC records. The original purpose of the Dublin Core was to serve as an author-generated description of Web resources that would specifically not require extensive training to operate (Lazinger, 2001, p. 157). The Dublin Core Metadata Element Set was initially formed in 1995, at a workshop in Dublin, Ohio (Lazinger, 2001, p. 151). The participants came from various related fields, including librarians, researchers, content experts and text mark-up experts. The multidisciplinary approach was integral to the key objectives of the initiative—to facilitate resource discovery on the Web, to document preservation and formatting activities and to support interoperability among resource description environments (Greenberg, 2005, p. 27).

There is currently no commonly adopted scheme that provides interoperability within the larger North American or International broadcasting context. However, there are a number of schemes that have been created with this in mind. The Public Broadcasting Metadata Dictionary Project, the Moving Image Collections (MIC), and the Visual Resources Association (VRA) have all attempted to establish a core group of elements in order to provide functionality in the realm of multi-media asset management. The subject reference scheme set up by the International Press Telecommunications Council and the Newspaper Association of America was developed for the categorization of all material related to news—including text, video, animation and images (Austerberry, 2006, p. 134).

If the core purpose of metadata is examined carefully—“to increase the odds that a user will be able to retrieve appropriate information and assess its usefulness and availability” (Hudgins et al., 1999, p. 1)—it becomes clear that interoperability is of fundamental importance.

As an example, we can examine convergence in media industries and the related issue of concentration of ownership of media properties. The ability to access databases of content for the purposes of reusing and reselling is one of the driving forces behind media industry consolidation (McCargar, 2004, p. 26). The activities of repurposing and consolidation of media assets are dependent on metadata structures that are interoperable. As media collections grow larger and larger the need for effective metadata structures grows as well.

The notion of interoperability links to a critical issue for the development of any kind of metadata structure—a consideration of available labour power. The time and effort that is required to operate a system of metadata is a measure of its sustainability. If a given structure is too costly to maintain (measured in time and/or capital) it will collapse under its own weight. A cost-benefit analysis lies at the heart of all decisions regarding the construction and implementation of any kind of metadata system. The cost of labour requirements will always be played against the benefits offered. Interoperability is a benefit that must be considered in this context. If we look at this from the perspective of a business model the cost-benefit analysis is fairly simple. The profit accrued from the re-purposing and consolidation of media assets must exceed the cost of the labour involved building and maintaining the metadata structure that makes it possible.

The same can be said for the issue of granularity. Granularity refers to the level of refinement of a given schema or scheme (Greenberg, 2005, p. 23). Simple Dublin Core is an example of a schema with coarse granularity (there are roughly 20 elements involved depending on which version is being examined). By comparison the Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata (CSDGM) is a fine-grained schema with over 320 compound metadata elements (Greenberg, 2005, p. 32).

The Standard Media Exchange Framework (SMEF; n.d.) Data Model is a comprehensive taxonomy for information involved in the production, development, use

and management of media assets. SMEF was developed by the Media Data Group (BBC Technology) for the British Broadcasting Corporation (BBC). It consists of a set of standardized metadata schemes, data rules and data values. The goal is the achievement of interoperability across systems. A closer look at the SMEF Data Model puts this into perspective. It is a comprehensive taxonomy for information involved in the production, development, use and management of media assets. The ultimate goal is the achievement of interoperability across systems. Although the model has been developed for use within the BBC, the definitions are organization independent and so are relevant to any group involved in media asset development and management. A detailed discussion of the SMEF Data Model is beyond the scope of this thesis, although it is potentially a rich source of information and should be examined carefully by organizations wishing to implement a taxonomy geared towards providing online access to media clips.

2.3. Taxonomies and Folksonomies

Standardized data schemes, rules and values are manifestations of the power to categorize. At every step of the way decisions are required for the creation of metadata that separate items or ideas into spatial, temporal, or spatio-temporal segments (Bowker & Star, 2000, p. 10). The systematization of this process is referred to as a taxonomy. According to Alex Wright (2007) "A taxonomy, in its simplest form, is a system of categories that people use to organize their understanding of a particular body of knowledge" (p. 23). A taxonomy is a controlled vocabulary of terms that establishes a hierarchy of parent-child relationships (Smith, 2008, p. 72). The Dewey Decimal system, for example, reserves the 200s for the category of "Religion". The category of "Islam" is found under the number 297 as a child of the parent term "Religion".

The top down hierarchical structure of a taxonomy can be contrasted with the bottom up, emergent nature of a network. A network has no top or bottom; it consists of nodes that emerge as a result of the interaction of its parts (Wright, 2007, p. 7). In terms of information architecture this means that specific metadata schemes, rules and values do not apply. The World Wide Web has qualities of a network. Users are not forced to

use any particular metadata scheme.⁵ There is no established controlled thesaurus of descriptive terms that users must adhere to when they publish their pages. We navigate the Internet predominantly through search engines that extract meaningful information through the use of data mining and algorithmic processes.

It is possible that responsibility for metadata creation could be turned over to actors other than trained librarians or archivists in a work environment. Please refer to the video clip “Server Management” in Appendix A for a presentation of how the video server could be used to facilitate the collection of user-generated metadata. User-generated keywords or tags can currently be found in online situations where large amounts of quickly flowing information are open to the public. Sites like YouTube, Flickr, Amazon, and countless others incorporate user-generated tags as a key part of their navigation structure (Andreano, 2007, p. 8).

In a tagging system users add tags to resources. A tag is a keyword, an open-ended data term (Smith, 2008, p. 4). The use of tags is significantly different than the use of physical metadata systems like cards in a filing cabinet. Tags are not dependent on spatial arrangements to function. The folder based graphical user interface commonly used in computer operating systems carries with it the baggage of previous systems that depended on linear sequencing. Tagging on the other hand represents the first significant change from the concept of one-thing-in-one-place that seems to permeate our working lives. With tags, the very concept of place becomes irrelevant (Smith, 2008, p. 18).

In a taxonomy relationships between terms or between concepts referred to by terms are pre-defined, rigid and stable over time. The use of tags to create relationships between resources has been referred to as a “folksonomy”. Thomas Vander Wal coined the term folksonomy in 2005 specifically as a way of referring to the phenomenon of how emergent categories form from the tagging efforts of large numbers of people (cited in Weinberger, 2005, p. 165). A folksonomy has no formal relationships (Smith, 2008, p. 82), instead algorithms are used to assess tagging patterns. Categories are created on

⁵ The Dublin Core is an attempt to establish the baseline for a universal standard, but it is a guideline. For the most part users can choose to use it or not.

the fly and are constantly in flux. Folksonomies have four characteristics: tagging is done independently; tags are aggregated; relationships are inferred and any inference method is considered valid (Smith, 2008, p. 84).

An information architecture based on tagging removes many limitations to the entering of metadata. There are no rules or preset data values. Removal of the top-down restrictions of a taxonomic data structure seems like an empowering act, it could even be described as democratic. The power to categorize is taken from an authority and given over to individual users. In the case of journalism, however, this issue needs to be examined extremely carefully. Are the potential benefits of folksonomic data systems applicable in broadcasting archives?

3. The Field of Television Journalism

3.1. Disciplinary Approaches to the Study of Journalism

The field of Journalism has received attention from diverse areas of academic inquiry. Barbie Zelizer (2004, p. 8), for example, in *Taking Journalism Seriously: News and the Academy* established five primary perspectives through which to examine the processes of news construction. In her view, Sociology, History, Language Studies, Political Science, and Cultural Studies are the dominant *lenses* through which journalism is studied academically. This is, of course, just one way to categorize studies of the field of journalism. Zelizer (2004) acknowledges this when she says that the chapters on each of the above areas of study are not “mutually discrete or exclusive” (p. 9). This is an attempt to avoid categorical rigidity and at the same time establish a basic frame for the analysis of scholarly studies of journalism.

The development of collective cognitive categories and their connections to the broader world are an important component of systematic scholarly analysis (Zelizer, 2004, p. 5). Michael Schudson (2003) for example, notes that there are five categories of distortion cited in studies of news bias: “News is said to be typically (1) event-centered, action-centered, and person-centered; (2) negative; (3) detached; (4) technical; and (5) official” (p. 48). It could also be argued that these categories are arbitrary. The first could be broken into three separate units, for example, or another category added. This could also lead to endless hair-splitting and an impaired ability to communicate meaning about this particular topic. While shared categories may be useful for making collective sense of the world they can also impose patterns in the process of knowledge construction and meaning making.

Zelizer (2004) acknowledges the difficulty of breaking free of established consensus around any given classification system, maintaining that there is a tendency to organize new phenomena along the lines of existing schemes (p. 5). This sets up an interesting paradox. On the one hand, categories are required by scholars to share meaning. As Mary Douglas observed true solidarity: “is only possible to the extent that

individuals share the categories of their thought” (Douglas, 1986, p. 8). On the other hand, the process of sharing established categories tends to distort the processes of gathering and sharing knowledge in powerful ways. Categorical rigidity exists in the disciplines that have traditionally handled the topic of Journalism. Peter Dahlgren (1992), for example, argued that the study of journalism has been primarily defined in terms of *hard news* ignoring other forms. It is possible that this kind of conceptual rigidity has helped to foster a disconnect between journalistic practice and journalistic inquiry (Dahlgren, 1992, p. 7).

Zelizer’s (2004) *News and the Academy* provides a thorough examination of the ways that different dimensions of journalism have been stressed and ignored through the lenses of different disciplines. She makes the case that scholars have produced five distinctive definitional sets through which the processes of news making have been identified. These include institutional, professional, personal, textual, and practical sets (Zelizer, 2004, p. 36). Increasingly, new technological configurations blur the lines between these categories. The deployment of networked, digital collections of media assets, for example, has introduced the potential for a profound shift in the ways that news stories are constructed in all of the dimensions given above. The challenge in a study of the use of data fields in a journalism archive is to develop an ontological position that is capable of dealing with phenomena that cannot be reduced to rigid categorical structures while simultaneously maintaining a common framework that allows for the sharing of meaning.

3.2. Bourdieu’s Journalistic Field

The notion of the journalistic *field* has been extensively explored by the French sociologist, Pierre Bourdieu (1996). Known mostly for his studies of power relations in social life, Bourdieu began to publish work on the field of journalism in the 1990s after the television sector was commercialized in France (Benson & Neveu, 2005, p. 1). According to Bourdieu, a field is a structure that is composed of social positions within which struggles or positioning occurs over access to specific resources (cited in Wacquant, 1989, pp. 37-41). A formal definition, derived from an interview with Bourdieu, is given by Wacquant (1989) who wrote that a field is:

... a network, or a configuration, of objective relations between positions objectively defined, in their existence and in the determinations they impose upon their occupants, agents or institutions, by their present and potential situation... in the structure of the distribution of power (or capital) whose possession commands access to the specific profits that are at stake in the field, as well as by their objective relation to other positions.... (Wacquant, 1989, p. 39)

In general, strong fields have the capacity to influence and overpower weaker fields (Wacquant, 1989, p. 41). The field of politics can impinge upon and play a role in the restructuring of the field of journalism, for example. The social world, in Bourdieu's view, is composed of interwoven field structures that overlap and structure each other.

A field is a structured social space, a field of forces, a force field. It contains people who dominate and others who are dominated. Constant, permanent relationships of inequality operate inside this space, which at the same time becomes a space in which the various actors struggle for the transformation or preservation of the field. (Bourdieu, 1996, p. 40)

A television news department can exist as a field that constantly interacts with the larger fields of the particular television station, the field of the network and the field of journalism in general. All of these field structures continuously impinge upon and structure each other.

According to Bourdieu's theory, every society has a single field that is regarded as dominant or pre-eminent; he called this the "field of power", the ultimate source of the hierarchical power relations which structure all other fields (cited in Jenkins, 1992, p. 86). Bourdieu's central thesis in his book *On Television* is that, as the journalistic field becomes increasingly commercialized, it also becomes more closely aligned with the broader economic field (Benson & Neveu, 2005, p. 6). This produces a convergence among all fields, as they are drawn closer and closer in alignment to the field of power. In particular, *On Television* is an exploration of the complex of relationships that exist between the fields of social science, journalism and the political field.

At the heart of Bourdieu's theoretical world lies a simple concept: the structuralist view that all social agents have "principles of vision and division" or categories of perception that are socially constituted and socially acquired (Benson & Neveu, 2005, p. 36). The use of the term *di-vision* refers to seeing the world as being composed of binary opposites—for example, feminine/masculine, good/bad, capitalist/socialist, news/not-

news etcetera. These *practical schemes* link together to form the *doxa*, a set of tacit presuppositions that any member of a society accepts as part of a condition of membership (Benson & Neveu, 2005, p. 37).

According to Bourdieu (1996), players in the interrelated fields of social science, journalism and politics all struggle to organize the world along the lines of certain categories of perception. This process is facilitated by the act of classification. A classification is “a spatial, temporal, or spatio-temporal segmentation of the world” (Bowker & Star, 2000, p. 10). The word “category” stems from the Greek verb *kategorēin* which means to publicly accuse. These struggles continue to resonate with the original Greek meaning. Social power is rooted in the ability to make categories public and to then impose these schemes on the social world (Benson & Neveu, 2005, p. 37).

For Bourdieu, the mechanism through which categories of perception are imposed on social actors is the *habitus*; a Latin word that refers to a typical condition, state or appearance (Jenkins, 1992, p. 74). For Bourdieu, the *habitus* functions as a bridge between subjectivity and objectivity, between agency and structure (Benson & Neveu, 2005, p. 3). The exact definition of *habitus* is notoriously difficult to pin down, it can be referred to as: “[the] system of schemes of...perception, thought, appreciation and action which are durable and transposable” (Bourdieu, 1990, p. 13). It is “an acquired system of generative schemes objectively adjusted to the particular conditions in which it is constituted” (Bourdieu, 1977, p. 95).

The *habitus* disposes agents to behave in certain ways, it provides a foundation for practice (Bourdieu, 1990, p. 52). A journalist’s *habitus* informs their activities in ways that contribute to establishing their position in a field of practice. *Habitus* includes things like posture and other physical behaviours as well as thought patterns acquired through life experience. Essential to Bourdieu’s work is the notion that an agent’s *habitus* and an agent’s position in a field of cultural production (such as, for example, the field of journalism) are enacted through practices adjusted to specific situations (partially determined by the history of the field) in ways that both structure the field and are structured by it.

In his book *On Television*, Bourdieu argues that it is the enabling and constraining conventions of the journalistic field rather than particular technologies that

shape the content of television journalism (cited in Sterne, 2003, p. 373). This argument illustrates a number of issues with Bourdieu's theory that make it difficult to employ in an analysis of electronic archival practices. Although Jonathan Sterne (2003) makes the argument that there is a place for Bourdieu's theory in the study of technology, there are some problems that are difficult or impossible to overcome. First of all, the relationship between field and *habitus* is far from clear in Bourdieu's writing (Jenkins, 1992, p. 90). It is difficult to adopt Sterne's (2003) argument that sees technologies as subsets of *habitus* (see p. 370) when the interaction between *habitus* and field is itself not made explicit. There is also the charge that Bourdieu is deterministic. His model claims that social structure and history produce the *habitus* which then generates practices which, in turn, reproduces social structure (Jenkins, 1992, p. 97). It can be argued that this leaves little or no room for subjectivity or conscious actions.

3.3. Actor-Network Theory

Actor-Network Theory (ANT) takes a different perspective, one that deals with technology and issues of determinism in a unique way. Actor-Network Theory does not acknowledge an essentialist division between what we tend to categorize as human or non-human (Law, 1999, p. 383). What counts as a person, for example, can be seen as a pattern of different kinds of materials. This material heterogeneity includes the objects and relationships with technology that humans surround themselves with (Law, 1999, p. 383). This concept can be difficult to grasp initially as humans have acquired a set of fairly rigid conceptions of what counts as belonging to the category of human and what does not. Actor-Network Theory does not try to define exactly what the criteria for being human are, it simply points out that this distinction shouldn't be made *a priori* by sociologists or researchers when these kinds of relationships are being studied (Latour, 1992, p. 4). "The great difficulty in ANT is to not be intimidated by the type of figuration: ideo-, techno-, or bio-morphisms are 'morphism' just as the incarnation of some actant into a single individual" (Latour, 2005, p. 54).

If we look at the example of a journalist navigating through a database looking for visual material to use in a news story, it is easy to make a common sense distinction between what is human and what is technical or non-human. On closer inspection, however, the distinction can quite easily break apart. Memories, for example, are

considered a fundamental part of what it is to be human but in this case it is difficult to say exactly *where* memory resides. Is it in the mind of the user? Is it stored in the hard drive of the computer? Or is it distributed somehow between these entities?⁶ Seen from an ANT perspective memory in this case is an effect or result of the relationship between the various elements involved. The term *heterogeneous network* “is a way to suggest that society, organizations, agents, and machines are all effects generated in patterned networks of diverse (not simply human) materials” (Law, 1999, p. 380). When the essentialist distinctions between human and non-human, society and nature are removed the dilemma posed by whether agents are guided by society or technology disappears as well. All elements of these systems exist in a unified field of associations where changes in any relationship between elements can be causally connected to all of the other relationships and vice versa.

ANT provides a useful perspective for dealing with the dichotomy of social/technical determinism but can it handle the larger issue of agency/structure? Latour (1999) suggests that it is possible that society is not composed of a dynamic between agency and structure at all but instead has the property of being a circulating entity (p. 17). An *actor* is not the source of action, an actor is a culmination or convergence of vast numbers of other entities in motion (Latour, 2005, p. 46). If we were to attempt to visualize directions of causality in this kind of space we would see that causality extends in all directions from every point in space and time. What is important in terms of the occurrence of physical reality as we know it is that certain relationships between elements are more likely to happen than others. Another way to think of this is to substitute probability for causality. Relationships occur between patterns with varying degrees of likelihood. By extension one might propose that the way that the evening news gets edited together isn't determined by the technology or by society or by the personal characteristics of the journalist. The outcome—a television news segment—is not reducible to being an *effect* of any one of these things.

The idea that society and action involving both human and non-human components introduces a radical shift to the concept of agency. It implies that agency is

⁶ Please refer to the video clip “Computer Search” in Appendix A for an exploration of how Journalists at CBUT search for visual material.

not to be found in the individual actor but rather is acquired by the interaction of actors (human and non-human) within a larger system. The metaphor of a puppet can be used to discuss user agency. The more strings a puppet has the more articulated they become (Latour, 2005, p. 216). If we look to the human user of a computer it is not simply the case that the user controls the computer in the way that a puppeteer would control a marionette or vice versa. There would be strings zipping off in many directions in space and back through time as well. Rather than seeing the strings as constraints, Latour sees them as conduits that allow the possibility of agency. Latour (2005) also uses the metaphor of circulating plug-ins to describe this process (p. 207). A software plug-in is something that is usually available on-line in a network of possibilities. When a plug-in is downloaded and installed it provides the possibility for a computer to act in different ways. Extending this metaphor to human users shows how agency can be viewed as an emergent property of the relationship between circulating entities and not an essential or inherent characteristic of the actors themselves.

It might be tempting to view local sites of action occurring as the result of a global structure—a type of field, or society. The editing of a local television news segment is obviously influenced by the occurrence of events that occur literally on a global scale. It is important, however, to remember that the hyphen in Actor-Network exists as a reminder of the difficulties of getting caught up in the micro/macro, local/global dichotomy. According to Latour (2005):

No place dominates enough to be global and no place is self-contained enough to be local. As long as we try to use either local interaction or structure, or some compromise between the two, there is no chance to trace social connections....
(p. 204)

The dissolution of the micro/macro, local/global dichotomy hinges on the existence of a causality that is ubiquitous in time and space.

The distribution of causality or probability has the effect of localizing the global and distributing the local. When a news editor cuts together footage from a database or catalogue of footage it can be said that this interaction or relationship of elements is not isotopic (Latour, 2005, p. 200). This means that it is impossible to restrain the causal elements to the local site. News footage provides a good example because it is generated locally, regionally, nationally, and internationally. The nature of the footage

and where it comes from is formed from interactions occurring in many different places. Any change in the paradigm of available footage will shift the construction of the narrative. Interactions are also not synchronic (Latour, 2005, p. 200). That the footage was shot at many different times is an obvious example. The chronological distribution of causality is much more complicated than that, however. How would it be possible to separate what is happening in the moment at a micro or local site from all of the elements that occurred in the past? The computer that the story is edited on, the software, the editor, the footage, all of these things are sets of relationships that cannot be separated from other sets of relationships that have occurred in the past, and in distant places.

Actor-Network Theory has been referred to as the ruthless application of semiotics (Law, 1999, p. 2). The meaning of this can be traced back to some of the fundamental principles of semiotic theory. The key point is that entities achieve their form as a result of the relations in which they are located (Law, 1999, p. 2). A text written or constructed on a computer is a dynamic network of relationships that extends into the physical make-up of the computer, to human minds, the virtual space of the Internet and beyond. Changing any of the relations between elements in the whole network changes the meaning of the text and vice versa. ANT extends this concept to *material* objects and technology. According to Umberto Eco (1976):

The classical notion of a 'sign' dissolves itself into a highly complex network of changing relationships. Semiotics suggests a sort of molecular landscape in which what we are accustomed to recognize as everyday forms turn out to be the result of transitory chemical aggregations and so-called 'things' are only the surface appearance assumed by an underlying network of more elementary units. (p. 48)

What we think of as nouns are really illusions—all *things* are really just shifting relationships between other elements. A chair, for example, is composed of atoms, but atoms themselves are constituted of a relationship between neutrons, protons and electrons. These elements are further composed of relationships between other subatomic particles. The fundamental nature of what we think of as *signs* and what we think of as *objects* is ultimately the same thing—a complex probability matrix of relationships that is constantly in flux.

According to semiotic theory, a sign is not static, it is a function or relation between the signifier and the signified (Bolter, 2001, p. 177). The meaning of any sign depends on the relationship that it has with a larger signifying system of language, symbols, and meanings (Attalah & Shade, 2002, p. 32). The idea of a text, or texture, is a metaphor related to the weaving together of signs in a complex spatial arrangement (Bolter, 2001, p. 177). This involves the intersection of not only signs but the codes by which they are arranged as well.

The elements in a system of signs can be related in two dimensions—the syntagmatic and paradigmatic. According to Roland Barthes, “the syntagm is a combination of signs, which has space as a support” (quoted in Manovich, 2001, p. 230). The words on this sheet of paper/computer screen are an example of a syntagm, supported by a particular kind of space depending on how they are presented. The paradigmatic dimension can be seen as a set of related elements from which the elements used to form a syntagm are chosen (Manovich, 2001, p. 230). Archival databases are a form of paradigm, they consist of collections of related items gathered into an accessible interface. The process of constructing a news story using non-linear editing software on a computer is a good example. The user engages in a process of selecting various types of signs from a database. These signs are then strung together to create a narrative structure or syntagm.

The current trend towards the development of online, server-based, metadata-driven content management systems in the broadcasting industry is a particularly complex and dynamic phenomenon. News construction evolves and adapts with these changes but it also shapes the technical practices and technologies involved. It is difficult to predict the potential implications of these shifts. As technologies change, the production of news is transformed in subtle but profound ways. Yet the structure of archival data fields is itself delicately interwoven with the people and processes of television journalism. From this perspective the *field* of television journalism dissolves into a complex network of densely woven connections between humans, non-humans, and the data structures that are distributed across both categories. In order to proceed with a study of archival data structures it is thus necessary to remove a *priori* distinctions between technology and society. The research design developed for this study is based

on the ontological dissolution of the boundaries between the data fields that are used to construct news content and the field of television journalism.

4. Methodological Considerations

4.1. Introduction

Conducting a study of how human users interact with archival data fields requires methods capable of handling complex flows of events. Unlike chemistry or physics there are currently no accepted universal laws that can be used to make cause and effect predictions about what will happen (Fassnacht, 2006, p. 114). The elements involved (human users, computers, programming logic and languages, etc.) all derive their meaning and form through their relationships with each other. Seen in this way the distinction between *cause* and *effect* breaks down. All of the elements involved are causes and effects simultaneously. What we are confronted with is a reality given form by the intersection of shifting sets of relationships so complex it might seem impossible to derive any kind of meaning from them.

John Law (2004), in his book *After Method: Mess in Social Science Research*, makes the argument that it is possible to conduct meaningful research in complex situations. His approach is an attempt to imagine a social science that is capable of dealing with mess, confusion and relative disorder (Law, 2004, p. 2). The idea is to embrace complexity rather than to reduce complex phenomena to the point of meaninglessness for the purposes of fitting observations within a dominant paradigm. This doesn't necessarily entail the abandonment of conventional research methods but it does require a questioning of the need for absolute certainty (Law, 2004, p. 7). Law (2004) states, "My hope is that we can learn to live in a way that is less dependent on the automatic. To live more in and through slow method, or vulnerable method, or quiet method" (p. 11).

The particular methods that I have employed fall under the traditional category of *qualitative* research. Jennifer Mason (2002, p. 1) recommends the use of qualitative methodologies that "celebrate richness, depth, nuance, context, multi-dimensionality and complexity rather than being embarrassed or inconvenienced by them." Qualitative research tends to adopt an *interpretivist* paradigm in that it seeks explanations for how

social reality is experienced, produced, understood and constituted (Mason, 2002, p. 3). This approach employs methods that are flexible and sensitive to the context in which data is produced (Mason, 2002, p. 3). This is an apt description of the analytical tasks required to examine the particular research question that I am posing in this section.

This does not entail an argument for an “anything goes” type of research process. The goal of conducting this research was to bring data and theory together in the search for meaningful, repeating patterns (Law, 2004, p. 111). In the incredibly hectic and noisy background of activity at CBUT Vancouver this was a difficult task. I am not claiming any kind of special insights or abilities as a researcher to make objective observations of reality. I am, however, making the claim that I followed a research trajectory that began the process by being open minded and not making a *priori* assumptions. As the process unfolded I was able to identify meaningful patterns and then use those to continue the process. In the following sections I will outline the measures of quality used in the research process employed in this study.

4.2. Qualitative Measures of Quality

Bauer, Gaskell, and Allum (2006) point out that the quantitative research tradition has an established discourse on quality in the research process (p. 10). This discourse provides standards for peer review, a basis for self-criticism, an easily accessed form of public accountability, and didactic tools for the training of students (Bauer et al., 2006, p. 10). Gaskell and Bauer (2006, p. 342) stress that criteria for assessing quality of research lies at the heart of the quantitative tradition. While there have been difficulties in establishing the correlates of reliability, validity, and generalizability in the qualitative tradition these concepts should not be abandoned (Mason, 2003, p. 39).

Gaskell and Bauer (2006, p. 344) put forward two broad categories for the establishment of quality assurance in the research process—confidence and relevance. These terms encompass techniques used in both quantitative and qualitative research traditions. Confidence markers allow the reader of a research account to be confident that the results of the work conducted represent the reality or realities that were researched. This is a quality check to ensure that results are not fabricated for a purpose outside research (Gaskell & Bauer, 2006, 344). Relevance indicators refer to the extent

to which the research links “internally” to theory or in terms of finding unexpected results that challenge or confirm common sense “externally” (Gaskell & Bauer, 2006, p. 344).

Gaskell and Bauer (2006) frame the debate of the establishment of measures of quality in qualitative research around three possibilities (p. 343): direct mapping of criteria from the quantitative tradition, outright rejection based on the “positivist” nature of these categories, and a third way which seeks to define criteria unique to qualitative research but at the same time functionally equivalent to existing quantitative measures. By following the third of these options the authors hope to establish claims-making and public accountability as central issues in any kind of qualitative research process. Gaskell and Bauer (2006, p. 344) put forward six quality criteria that contribute to the confidence and relevance of qualitative research: transparency and procedural clarity, corpus construction, triangulation and reflexivity, thick description, surprise value and communicative validation.

Procedural clarity can be achieved by keeping good documentation, and ensuring that there is transparency and clarity in the procedures of data elicitation. For qualitative research transparency fulfils a similar function that internal and external validity performs for quantitative research (Gaskell & Bauer, 2006, p. 346). Transparency can be achieved by ensuring that as much of the procedures used are documented and made available for scrutiny after the research has been conducted. Examples include descriptions of selection procedures, topic guides from interviews, coding frames etcetera. This principle is a key marker of confidence.

All types of empirical social research need to establish a system of justification of the selection of evidence (Mason, 2003, p. 1). An established set of guidelines for achieving this exists in quantitative analysis—probability sampling. However, probabilistic sampling techniques like statistical random sampling are not always appropriate or possible for qualitative research purposes. Bauer and Aarts (2006) propose that “corpus construction” (p. 19) be put forward as an alternative principle for data collection in some types of qualitative research. In its simplest terms corpus construction refers to a systematic selection with a rationale other than random sampling (Bauer & Aarts, 2006, p. 20). The main purpose of any kind of sampling is to study parts

of a population without losing information. The hope is that characteristics of the sample represent the characteristics of the target population.

There are many reasons for using alternative selection procedures other than random sampling. Corpus construction is best used when the characteristics of a population are unknown. If a well-defined sampling frame⁷ exists then it is possible that the procedure of statistical random sampling would be the best method of selection (Bauer & Aarts, 2006, p. 20). The main premise of corpus construction is very simple: (a) to make a small selection (b) to analyse this selection (c) to repeat this procedure until no new variety is found (Bauer & Aarts, 2006, p. 31). The stopping criterion for the procedure is known as saturation, this refers to Step C above where no new variety is detected (Bertaux, 1981). This strategy for selection is a marker of both confidence and relevance. Corpus Construction was used as a rationale for selecting research participants and documents in the research design. Corpus selection is regarded as differing structurally from random sampling while being functionally equivalent (Bauer et al., 2006, p. 20).

All researchers are inevitably put in the position of trying to make sense of the activities of other actors from their own worldview. Gaskell and Bauer (2006, p. 345) note that reflexivity implies that the identity of the researcher changes as a result of the act of research. As Sarah Pink (2007) has noted, "Reflexivity goes beyond the researcher's concern with questions of 'bias' or how ethnographers observe the 'reality' of a society they actually 'distort' through their participation in it" (p. 23). In her view ethnographers need to communicate the experiences and contexts from which their observations were obtained (Pink, 2007, p. 120). Acknowledging reflexivity in the practice of research does not negate the value of the work achieved. It does, however, mean that reflexivity must be accounted for in the process. According to John Law (2004, p. 143), "Method is not, as I have argued, a more or less successful set of procedures for reporting on a given reality. Rather it is performative. It helps to produce realities." Triangulation in qualitative research is an effort to address the process of reflection in a research project (Gaskell & Bauer, 2006, p. 345). This is not "triangulation

⁷ An example of a sampling frame is a list or set of lists of members of the population.

of method” in the sense of using multiple methods to confirm validity along the lines of one, objective, and knowable social reality (Mason, 2003, p. 190). It is an effort to use triangulation in a broader sense to use multiple methods to most fully explore a set of research questions (Mason, 2003, p. 190). Triangulation and reflexivity are important markers of confidence.

Another marker of good practice in qualitative research is the use of verbatim reporting of sources. This is related to the concept of *thick description* as developed by Clifford Geertz (cited in Gaskell & Bauer, 2006, p. 347). Geertz makes the point that a good social science report is like a good piece of theatre. It brings the reader into the life worlds of the social actors involved. The claims and generalizations of the report are validated based on the involvement of the reader. In this way thick description provides a mechanism for establishing relevance (Gaskell & Bauer, 2006, p. 347). Thick description also provides a mechanism for confidence in that the reader or scrutinizer of a report can always check the original to verify whether they would come to the same conclusion as the researcher (Gaskell & Bauer, 2006, p. 347). There is a difficult balance that must be obtained here; the form of the final report cannot simply be a collection of full video interviews or a collection of transcripts. On the other hand, decisions around what to include or more importantly, what not to include in a report, can seriously compromise the provision of a thick description in the way that Geertz originally intended.

The surprise value of the relevance of any research effort is also a marker of quality (Gaskell & Bauer, 2006, p. 347). Unexpected results can contradict expectations from a common-sense point of view or a theoretical framework. Simply put, it is suspicious if evidence obtained from a research process acts solely to confirm existing evidence (Gaskell & Bauer, 2006, p. 347). Surprising findings demonstrate that the research process was open-minded and fluid.

A form of relevance marker that has some equivalence to the idea of validity in quantitative terms is communicative validation. This entails confronting the sources of interview or text materials and obtaining their agreement that the evidence collected is an accurate representation (Gaskell & Bauer, 2006, p. 348). There are some obvious benefits to this kind of approach. It provides a check on the quality of the evidence obtained, as well, it allows for a certain empowerment of the actors or research

participants. This can also lead to a potential problem. It is possible that communicative validation opens the way for the misuse of power by the actors. For this reason any feedback obtained from a research participant must be put into perspective of the researcher's own observations of the whole field. This is a delicate balance, communicative validation works well when it illuminates the blind spots of the researcher. It is counterproductive if the blind spots of the research participant become too dominant (Gaskell & Bauer, 2006, p. 348).

The discussion of quality assurance markers above is not meant as a comprehensive or final answer to the very difficult problem of defining accountability in qualitative research. It is an attempt to work with current ideas around the topic that will evolve over time. The reason to engage in such a discussion is to acknowledge the difficulties involved without giving up on the development of accountability in the domain of qualitative research. In the following sections I will describe the particular methods used in this study. As much as possible, I will discuss how the markers of quality described above were used in this study.

4.3. Participant Observation

The first step in this investigation entailed a period of participant observation at the CBUT archives. I began visiting the media library at CBUT Vancouver in July of 2007. Previously I had met with Colin Preston, the Library Coordinator, to make arrangements and establish contact. Officially, the initial period of participant observation began on July 18th, 2007. During this phase of the research process I visited the premises as a participant observer two to three times a month through to November 12th, 2007. Establishing rapport with the many different types of users of the archive was a fairly smooth process. The intensity of the production environment with accompanying stresses and pressure did not hinder my ability to observe the situation. This was due largely to the personality of Colin Preston as my key informant. As the Library Coordinator and Shop Steward for the Union he was familiar with many of the hundreds of employees working at CBUT at that time. He introduced me to everyone that dropped by the media library complex and took me on tours of all of the main sites of interest. As an outsider peering into the inner workings of an organization like CBUT, I was overwhelmed by the sheer complexity of the operation. It took two or three visits just

to establish a basic familiarity with the outlay of the building⁸ and the people and technology within it. Given the situation, it was clear that the shift in technology at CBUT had the potential to yield interesting and relevant insights. I was able to observe the workflow and production practices before and after the switch to the digital server in September of 2007.

The purpose of this first phase of the research process was to establish a broad overview of the situation, to map the flow of video materials within the organization, to identify potential research participants, and to begin to examine their practices around using the media library. I was interested in how the relevant actors in the situation used the archives. To do this I examined the workflows of different types of users of the system—actors who were attempting to access records as well as those who created records. Initially, I observed the situation in a passive manner and did my best to blend into the background. When I felt that the research subjects were comfortable with my presence I began to move towards a more active style by asking questions. I knew that a new technology would be implemented that had the potential to change the current workflows. In this initial phase I wanted to develop an understanding of these clusters of archival practices before the change happened. This portion of the research process was documented with a combination of field notes and video material.

According to Mason (2003, p. 85), a rationale for using this particular method is that it is in alignment with an ontological position that sees interactions, actions and behaviours and the way people interpret and act on them as critically important. She describes participant observation as:

...methods of generating data which entail the researcher immersing herself or himself in a research 'setting' so that they can experience and observe at first hand a range of dimensions in and of that setting. These might include: social actions, behaviour, interactions, relationships, events, as well as spatial, locational and temporal dimensions. This method also fits an epistemological framework that suggests that knowledge of the social world can be obtained by observing and participating in 'natural' or 'real-life' interactions and situations.

(Mason, 2003, p. 85)

⁸ The complexity of the situation was intensified by the fact that, throughout the research process, the CBUT building was a construction site. Frequently I would come in to see that whole offices, departments and even floors had been gutted and then repurposed.

In a very a basic sense, I also chose to use participant observation because some of the data was not available in any other form. Observing the process of cataloging footage with a media librarian, for example, allowed for a much more thorough exploration of the process. This data would not have come out in the interview process or by researching documents.

The purpose of conducting an extended period of participant observation was to establish a typology⁹ of users of the system and to establish an understanding of their practices. An inevitable consequence of not making a *priori* assumptions is that the best way to observe a complex reality is to “follow the actors” themselves (Latour, 2005, p. 227). In his study of “Life Stories in the Baker’s Trade” Daniel Bertaux (1981) conducted interviews with bakers and their families before first coming up with a theory. Afterwards he was able to piece together an account based on his direct observations and their interview material. This order contradicts the logical positivist approach that insists on first developing a theory and then conducting research that either supports or does not support the theory.

I am not a media librarian or an archivist. This would take many years of education, training and job experience to attain. Any theory that I would develop or contribute to needs to be supported by interactions with actors who are experts in this field. I also need to be clear that the initial interest in the topic area was developed through existing theory and evidence presented in readings. What is important methodologically is that after I developed this area of interest I moved into a phase of research during which I observed the actors in the situation and tried to avoid making a *priori* assumptions. To avoid confusion, I believe it is necessary to state that the principle of not making a *priori* distinctions and judgements does not preclude having a focused research topic. I was interested in the interaction of the digital video server with archival practices. Specifically, I wanted to track the history of the media library at CBUT and how changing technology intersected with actors’ uses of the system in terms of classification systems for video material.

⁹ This will be presented in the next chapter.

Initial observations were recorded using field notes. Field notes were collected within the parameters given by Emerson, Fretz, and Shaw (2001) as: writings produced in or in close proximity to *the field*. Proximity meaning that:

Field notes are written more or less contemporaneously with the events, experiences and interactions they describe and recount ... Field notes are a form of representation, that is, a way of reducing just-observed events, persons and places to written accounts. And in reducing the welter and confusion of the social world to written words, field notes (re)constitute that world in preserved forms that can be reviewed studied and thought about time and time again. (p. 353)

My approach to taking field notes was that, although it was impossible to be a “fly on the wall” observer (Mason, 2003, p. 92), I could at least attempt to interfere as little as possible. In the early stages of the research process I avoided using the video camera and instead tried to record my observations only in written form. This was an attempt to introduce myself slowly into the research situation. If asked, I was clear about my intentions and the reasons for taking notes. I stated that I was a student conducting research into how the Media Library was used at CBUT and that the notes would be used to support my work.

I was also able to map out the flow of video materials from shooting in the field, to ingestion, editing, playback and finally storage. The intention was to follow the development of metadata tags as the material moved through the process. Within three to five visits I felt that there was a high rate of acceptance of my presence and that I could start filming. I used the camera to supplement the notes that I was taking. I was very selective about what to film, as I knew that creating too much footage would be difficult to analyze within the parameters of a master’s thesis. I also wanted to maintain as much good will about my presence as possible, which meant not interfering with the intense and harried workflows of the news production process. There were many times when I felt that I would have liked to film more but did not do so because I did not want to compromise the entire project by being disruptive. I was initially able to obtain permission to do the study with the promise that I would not interfere in any way with the production process at CBUT. I understood that my research could be stopped at any time if I did not comply with that agreement. I also felt that much of the data that I was looking for could be generated much more economically in terms of time through the interview process.

Becker and Geer have argued that participant observation is “the most complete form of the sociological datum” (quoted in Bauer et al., 2006, p. 44). Becker and Geer based this claim on their perception of problems with the process of interviewing subjects—the reliance on an informant’s accounts separated by the barriers of space and time (Bauer et al., 2006, p. 44). However, as Coffey has pointed out, “Fieldwork is personal, emotional and identity work” (Coffey, 1999, p. 1). The researcher as observer is separated from the immediate experience by the limits of their own attention, perception, and memory. What is important, however, is to work out strategies for handling the problems of selectivity and perspective in observation (Mason, 2003, p. 89).

Equally important is the issue of participation in the observation process. Obviously, taking notes and making video recordings necessitate being subject to *informant gaze*—being observed by the research informants. This means being part of the reality that is occurring and to some extent changing that reality. The participatory nature of ethnographic enquiry can be seen as a strength, the weakness of the method is not that participation occurs but that it is not acknowledged properly (Coffey, 1999, p. 36).

The use of a video camera in the latter stages of participant observation was carried out using a reflexive approach. This meant acknowledging the camera as a social actor that was inevitably bound up with the social nature of research (Prosser, 1998, p. 18). Heider (2006, p. 87), for example, saw two main types of distortions: distortions in the behaviour of subjects reacting to the presence of the camera and distortions that occurred during the filmmaking process itself from shooting through to editing. In the video clips contained in Appendix B, I took steps to acknowledge the distortion of the original material through the editing process. Whenever possible I kept the footage of the subject onscreen and did not attempt to smooth over cuts that I had made to the footage. Instead of covering the subjects’ images with other visual material I chose to keep their image onscreen whenever possible. Adopting a truly reflexive approach, however, means moving beyond this initial stage. Reflexivity is not a simple tactic that can be used to neutralize subjectivity for the purposes of being objective. It means accepting that it is impossible to record complete activities, processes and sets of relationships and that attention must be given to the contexts in which images are constructed (Pink, 2007, p. 120).

Working with participant observation in this study required a research strategy that dealt with the limits of my own observations as well as the ways that I changed the research environment by being part of it. The strategy drew primarily from the qualitative markers of quality as discussed previously. Using the camera to record observations when possible allowed for a form of thick description. Filming actors as they create and access records acts as a marker of relevance as it facilitates insights into their language and life world (Gaskell & Bauer, 2006, p. 347). This is also a marker of confidence as it contains a verbatim record of the event. Participant observation was one of the three methods employed in this study. Using this particular method along with interviews and document research allowed for a third qualitative quality check—triangulation. As discussed previously this was not an attempt to confirm the validity of one *true* reality. I was using triangulation in the broader sense of attempting to ensure that I explored my research question to the fullest extent possible given the available time and resources. The video clips in Appendix B contain visual material obtained from participant observation, interviews, and document research. The clips present markers of relevance and confidence in all of the dimensions outlined above.

Recognizing a video camera as a social actor brings up similar issues to recognizing the researcher as a social actor in the research situation. The researcher as observer frames reality through their own past experiences and the physiological construction of their sense organs. The camera as observer records a version of reality that is also framed by the construction of the lens, the type of microphone, the process of digitization of visual and acoustic signals. Rather than attempting to force objectivity onto the frame of the camera I chose to embrace subjectivity. Instead of trying to make a claim that the version of reality that I was capturing was as close to the one true reality that was occurring I chose instead to follow a research strategy that explored as much of the complexity of the research environment as was possible given the constraints that I was operating under. This was accomplished by triangulation—the version of reality captured by the camera was considered a synergistic extension to data generated by other methods and techniques. Video footage was not considered more true or accurate than field notes or the verbal reports of interview subjects. I also kept a log of shooting notes that acknowledged the position of the camera and details of the constraints of filming at CBUT.

It was inevitable that the camera as a social actor *distorted* the research environment. Human actors change their behaviour when a camera is present. It was impossible to control for this in terms of my research design. I consider the use of hidden cameras to be unethical in most research situations. I was able to maintain a relatively small researcher footprint because the relative energy level at CBUT was so high. As Karl Heider (2006, p. 90), has pointed out, high energy situations absorb attention to the point where less attention is paid to the researcher. For the most part, the users of the media library were caught up in various stages of news production. It is also likely that the subjects were sympathetic towards my efforts because they could see that the process of conducting academic research and the process of news production have much in common. The actors in the research environment were used to the presence of cameras and other types of equipment used in the news gathering process.

The method of participant observation proved to be quite effective in terms of developing rapport, finding future research informants, and building up a basic understanding of the work practices and uses of technology at CBUT. A reliance on this one particular method for the whole study, however, would have not allowed a full exploration of the research topic. At some point I needed to use other methods to get a deeper understanding of how actors actually use metadata as part of their particular set of work practices and the potential consequences for broadcasting archives given a rapidly shifting technological environment.

4.4. Interviews

The field notes and video footage from the previous phase of participant observation were used as a basis for the preparation of a series of qualitative interviews. At this point I began to feel comfortable enough with my level of knowledge of the situation to begin to make certain basic judgements and assumptions about the use of metadata at CBUT. I was attempting to proceed from not having any *a priori* assumptions about the situation to having enough data that I could construct topic guides for the first round of interviews. Although, as I will discuss later, each interview began with open-ended questions and then moved towards closed-ended questions. An example of a topic guide used in this study can be found in Appendix C. Beginning with open-ended questions was an attempt to keep the research process open and to not

give in to premature judgements about the data. Moving towards focussed questions near the end of each interview was necessitated by the time constraints involved and the need to get specific about the practices and archival infrastructure at CBUT. The material from each interview was analysed and then used to construct the topic guide for the next interview. This iterative procedure was used throughout the entire process.

The rationale for the choice of qualitative interviews as a method follows closely that of the rationale for participant observation. First of all, I followed a research style that was active and reflexive. Data obtained from interviews was viewed as being constructed and not excavated (Mason, 2003, p. 66). This was in keeping with the epistemological assumption that knowledge and evidence are contextual, situational and interactional (Mason, 2003, p. 64). The purpose of conducting qualitative interviews was to sample a range of views within the organization. This entailed ensuring that the interview subjects were selected from each of the job groupings of interest that I had identified during the participant observation phase. I wanted to obtain a wide range of opinions to explore the depth, complexities and subtleties of the processes involved creating and accessing archival records. Given the time constraints, I felt that conducting between 10 and 15 interviews would be appropriate. On a more pragmatic level, interviews were chosen as a method because most of the data was simply not possible to access any other way.

The iterative aspect of using data from participant observation to build towards the interview process served many purposes in terms of measures of quality. First of all, qualitative interviewing fit nicely with participant observation and document research as a form of triangulation and reflexivity.¹⁰ It also allowed for communicative validation in the form of questions included in each interview to confirm findings from the participant observation phase. Videotaping the interviews created a verbatim record of not only words but facial gestures and body movements as well. This provided a thick description of the events. Starting with open-ended questions provided a mechanism for surprise value. There were many issues that came up that were completely unexpected and

¹⁰ As discussed previously, this is not an attempt at *triangulation of method* in terms of confirming some kind of objective reality but, rather, *triangulation* in the sense of using several methods together to more fully explore an area of research.

therefore not part of a background research agenda. The interview subjects were chosen following using a procedure of strategic sampling. Material from some of the interviews is presented in the video clips in Appendix A.

The selection procedure for media librarians was very simple, considering that there were only five staff members in the department at that time. I attempted to interview them all. Of the five, two agreed to be interviewed using video and audio. One subject agreed to an audio interview only. Another media librarian declined entirely, and one subject worked with audio only and so was ruled out. Branching out from the media library was more difficult. There were hundreds of employees to choose from. I used the internal telephone directory to find participants. I worked through the list by job title in the positions that I was interested in. In the end, the practical limitations of conducting research in a workplace, especially a production environment that is extremely busy, dictated the composition of the sample more than any theoretical considerations. Many employees were too busy and declined my request for an interview. I was forced to accept a realistic goal of getting at least one representative from each of the areas that I was interested in. Luckily, I was able to interview at least one person from the types of actors that I had identified in the participant observation phase. During that time I had identified the key types users of the system in terms of both creating and accessing records. The final sample reflected this and consisted of three media librarians, three television producers, two television reporters, two television editors, one cameraperson, as well as the senior manager of television production services. I began conducting the interviews in February 2008. I proceeded through my list of potential subjects and continued the interview process until the last interview in October 2008.

I kept interviewing until I began to find the same responses. The decision to end the interview phase was a balance of time limitations (considering both my time and the time of the research subjects involved) and the reaching of a saturation point in terms of the responses that I was getting. At that point I decided that a reasonable saturation point had been reached and stopped conducting interviews. Material from the interviews is presented in the next chapter as well as in video material in Appendix A.

The style of interviewing used in this research project was a blend of techniques, modified to fit the intensity of the production environment. The goal was to allow the

informants to tell their own story as much as possible. In particular, the format was informed by the techniques of narrative interviewing and life history accounts. Narrative interviewing is a method that encourages a research participant to tell a story about a significant circumstance or series of events in their life and social context (Jovchelovitch & Bauer, 2006, p. 59). Narrative interviewing as a systematic technique was proposed by Schütze (1977) as a means for the reconstruction of social events from the point of view of research participants as directly as possible. Schütze proposed the idea of narrative interviewing as a critique of the question-response schema that imposes an *a priori* frame onto an interview by selecting the theme and topics, ordering the questions and by selecting the wording of questions (cited in Jovchelovitch & Bauer, 2006, p. 61).

The use of a true life history or narrative approach would not have been feasible in this particular situation. Both of these approaches require far too much time. My approach was to incorporate the intention of these methods as best as I could within the harried and intense environment that is CBUT. Initially, I considered attempting to conduct interviews off the premises in order to attempt to facilitate the lengthy amount of time required for these techniques. I abandoned this idea for two reasons. First, only the most generous interviewee would consider giving up time outside of work hours. Second, I decided that conducting the interviews in the contexts and situations that the actors actually worked in was relatively more important in terms of generating relevant material. All of the interviews had to be conducted during times that fit the actors' schedules. For the most part, this meant doing interviews in the mid-morning around break times.

The procedure for conducting all of the interviews followed the same basic procedure. Topic guides¹¹ were constructed for each interview beforehand. I did not give topic guides to the research participants before the interviews unless they specifically requested one. This was intentional. I did not want them to formulate concepts about desired answers. At the same time, if a potential subject was not comfortable with not having the topic guide first I would supply them with one.

¹¹ See Appendix C for an example of a topic guide used in this study.

4.5. Documentary Research

Another component of the research process used in this study involved examining archival records in the various systems used at CBUT over the years. The strategy was to map the historical trajectory of the system to identify patterns of usage over time. While it was possible that subtle traces of previous workflow practices remained in the current workflows, it was extremely difficult to use participant observation to identify these patterns. Material from the interviews was extremely valuable but needed to be supplemented with an examination of the archives and related documentation.

Documents, written or otherwise, are constructed in particular contexts and so cannot be seen as directly “evidential” or “representational” (Mason, 2002, p. 108). The process of selecting, observing and interpreting documents as a researcher adds another layer of construction to documentary research (Mason, 2002, p. 110). For this reason it is important to view documentary research in an archival or media library context as a process of construction in and of itself. A continual state of reflexivity is necessary to maintain a critical distance from both the original circumstances leading to the document’s creation as well as its reinterpretation as evidence.

Keeping in mind the necessary reflexive posturing outlined above, documentary research was an essential component of this research design. For one thing, the records in the archive were the primary objects of study. Another rationale for the use of primary and secondary documentation was that in some cases the information was not available in other forms. There were no witnesses available who used the earlier archival systems.¹² The earliest direct recollection of any interview subject only reached back to the late 1970s. Another reason for using documentary research was as a supplementation to the other methods used (participant observation and interviews). This falls in line with the use of documents to verify, contextualize and clarify the other methods used (Mason, 2002, p. 108).

¹² A description of these systems can be found in the next chapter and related video clips in Appendix A.

The records in the drawer and Rolodex systems as well as electronic records in the database are primary sources of the past archival processes. Also, the “lineups” or “bible” as it is still commonly referred to was an essential aspect of the study. Line-ups are a list or chronology of the stories edited in a given day. This provided an unbroken record of the production schedule at CBUT reaching back to 1953. Line-ups were initially typed out and kept in bound volumes. Currently they are kept in electronic form. This is an invaluable tool for the media librarians and also played a key role in the study.¹³ Other supporting sources of documentation included: technical documentation, various memos and emails supplied by the key informant, and resources found within the internal Canadian Broadcasting Corporation (CBC) website.

The selection process for records contained in the archival system followed the logic of strategic sampling. “Traffic” was chosen as a search criterion due to the large amount of records and possibilities for classification generated throughout the history of records at CBUT Vancouver. Specifically, the sample was constructed using the current iteration of the electronic database “Medoc” using a search for traffic. Of the records obtained this way a small subset of records was chosen. The key informant, Colin Preston was then observed conducting searches for material using each of the archival systems. Traffic as a search term also functioned metaphorically in the video clips contained in Appendix A. Without an organized system of signs and rules the movement of large numbers of motor vehicles would be impossible. It is the use of established conventions and the enforcement of a system of rules that allows for the relatively free flow of traffic. This theme is used throughout the clips to create space for the association of ideas around the structure of archival data fields.

The methodological strategy outlined in this chapter is an attempt to form a bridge between the ontological and epistemological positions that I am taking in this thesis. This approach was necessitated by the dynamic complexity of the research environment that I was operating in. I chose to embrace the complexity, with all of the difficulties that entails rather than attempt to reduce and simplify the process. In the next chapter I will present my exploration of the data structure at CBUT Vancouver.

¹³ Please refer to the video clips “Drawer Search” and “Rolodex Search” in Appendix A.

4.6. Observations: The CBUT Database Structure

The introduction of an online digital video server follows in a long line of technological change at the CBUT media library. The use of the server has tremendous potential to alter the ways that news stories are constructed. As an actor in the field of news production the digital video server interacts with all of the other human and non-human actors involved. However, the relationship between technology and shifts in the process of news content creation is not determined by either the specific technology or the people involved. The pace of change of work practice is variable and non-linear. This is in part due to the distribution of both the tendency to conserve work practices and the potential to change practices across human and non-human actors. All of which are capable of altering the probability or likelihood of certain outcomes.

The momentum of previous practices meant that change was much slower than I expected. Initially I had hoped to be able to observe changes in the months before and after the installation of the server. After the switch it became apparent that the system needed to be observed over as long a time as possible in order to identify meaningful patterns. Luckily, previous archival systems were left intact at CBUT. Placing the current changes within this historical context allowed for an exploration of the relationship between technology and humans as well as the shifts in the data systems used. A fascinating story emerged that builds a foundation for an understanding of possible future directions in archival practices in broadcasting. In the following sections I will present my observations of the development of the archival system following a historical timeline from.

4.7. Cards in Drawers

Ib Birkefeld, the first media librarian at CBUT, was not a professionally trained archivist. He began his work in the early 1950s and continued until the mid 1960s. His practice was shaped by the overall cultural, social and production context of the time. The system that he developed is presented in the video titled “Drawer System” contained in Appendix A. His procedure for accessioning a new record seemed fairly

straightforward: he typed one card per story, entered the relevant metadata on the card in designated areas,¹⁴ and then filed the cards by the title of item. The cards were arranged alphanumerically by this field.¹⁵ The practice of filing by the title or *slug* of a news piece streamlined the processing of records but it also limited the value of the metadata in terms of search and retrieval. Without keywords or categories, it was very difficult to find a record without having familiarity with the titles of the thousands of entries in the system. Over time, the current library coordinator, Colin Preston, was able to build up an understanding of contextual information that allows inferential use of the system.

So even if there wasn't sufficient data you began to see that these cameraman, whether they're here, Beasley and the like in the lower mainland or the Stevens in the Kootenays or Flet out of Nanaimo. You could use those clues... all of those bits of data became inferential and you could associate them geographically or topically.

(Colin Preston, Library Coordinator)

The media librarian had minimal control over the main entry field.¹⁶ The agency to dictate the content of this particular field, the title of any particular news item, was distributed over many actors—anyone who had input into the process of constructing the title. This included the writers, journalists, and producers at the time who were operating as a community of practice. A community of practice is a unit of analysis—a set of relations between people who share common activities (Wenger, 1991, p. 6).

Back to the initial sort of small monoculture that we had in the 50s and 60s at CBC ... it would be a relatively small circle of people sharing more or less the same outlooks and terminology. I don't think it would be, at the time, given the scale of the operation as difficult to navigate as one might think

¹⁴ Although these fields were not always consistent they tended to be composed of: unique identifier, title of item, location, date, description, physical length of reel, box number, and reel number.

¹⁵ Birkefeld followed certain commonsense guidelines for alphanumeric organization, for example, the item “New Cloverleaf” was filed under “C” for “Cloverleaf” and not under “N” for “New”. In this case he dropped the adjective “New” because it was common to too many stories and was obviously not going to facilitate retrieval.

¹⁶ Again, Birkefeld did follow some basic guidelines for alphanumeric filing. This meant that he had some marginal input as to the organization of the content of the main entry field.

because of the homogeneity of the workforce.

(Colin Preston, Library Coordinator)

In addition to card catalogue by title the original media librarian would sometimes cluster records under a subject—"Diefenbaker", for example, but in the vast majority of cases, records were filed only by title of the particular news piece. Distributing the agency to create the content of the main entry field limited user agency in terms of retrieval. For example, a search under the tab "traffic" yields a retrieval set of items that happened to have contained the word "traffic" in the first, or sometimes second position in the title. The original media librarian would have been the only person who could have used the system effectively. Although, even he would have had to rely heavily on his memory to use it effectively. The potential for finding records was distributed between his memory and the records themselves.¹⁷

When the first media librarian retired in the mid 1960s, most of the usefulness of his system retired as well. It was possible to find some items based on the semantic overlap between words contained in the title of the item and overarching subjects. A search under "t" for "traffic", for example, yields a set of records that had something to do with traffic. This, however, would only be a small subset of stories related to traffic. A story from 1956 with the title "New Cloverleaf", for example, was filed under "Cloverleaf" even though the focus of the piece was the alleviation of traffic to West Vancouver over the Lion's Gate Bridge. Global search results by subject were incomplete.

The most valuable records from the time that the drawer system was used were a form of documentation known as line-ups.

...the one standard document, which contained the core metadata, are the line-ups, the news line-ups which gave you the sequence through all the years from 1953 on. The sequence of items as they appeared within an individual news program. ... So you had a document which reflected the sequence of a

¹⁷ It would have been possible for anyone familiar with the titles of particular news-pieces to find stories effectively. The problem would have been that any one user would only be familiar with a subset of the records—the titles that they had been involved with. Birkefeld was the only one who had access to all of the records both in a physical sense of access and a semantic sense.

presentation of the news from day to day to day. And besides the title often you had the dateline, where some event occurred, everything through the mid 1990s.

(Colin Preston, Library Coordinator)

A search using the drawer system is very difficult to conduct without using the line-ups to supplement the data. Please refer to the video titled “Drawer Search” in Appendix A for an example of a search using the drawer system in conjunction with the line-ups.

4.8. The Rolodex

In the mid 1960s the first media librarian retired and was replaced by Rudy Penitsch, an Austrian immigrant. Penitsch, a photographer by training, was an outsider to the existing community of practice that existed at CBUT at the time, socially, culturally and linguistically. Even if he had entered the position from within the specific community of practice or *monoculture* that existed at CBUT, he still would have tremendous difficulty finding records. He inherited a system that depended on the experience and knowledge base of the particular librarian who created it. At that point, he took some important steps towards developing an information architecture that was not specific to his own unique set of experiences. It was impossible to determine whether Penitsch had been instructed to change the system or did so of his own accord. What is clear is that Penitsch began filing records for news stories loosely by subject instead of by title using a Rolodex instead of drawers. He also collected multiple records on single cards rather than using just one card per news story.¹⁸ By taking control of the main entry field he was able to increase the potential for users other than himself to use the system. Structuring the main entry field allowed for an enhancement of user agency in terms of search and retrieval. Please refer to the video clip “Rolodex System” in Appendix A for a presentation of the Rolodex system developed by Rudy Penitsch.

The story of the transition from the first media librarian to the second typifies the complex relationship between technology, human actors, and classification systems. In

¹⁸ At some point the original librarian began to face space limitations of his drawer system and had begun the process of compiling multiple records onto single cards. These instances were rare and unsystematic.

this case a personnel shift was accompanied by a material and symbolic shift (Bowker & Star, 2000, p. 39). The Rolodex did not cause the shift from filing under slug to filing by subject. In this case the human actors, technology and archival system shaped each other. The innovations of using a Rolodex, compiling multiple entries on single cards, and filing by subject instead of title were important developments in the taxonomic structure. By providing a structure for the main entry field that restricted the content to broad semantic categories it became possible for more users to access the system. Potential access to the system was extended beyond the monoculture of CBUT in the 1950s to a wider plurality of communities of practice. However, a prior knowledge of both the collection and the format of the metadata were still important.

So you would have these categories, if you were going to look up something like a place like Sointoola or Kaslo or Lardo you would look under "p", for place. Well, there was no guide to that you just had to figure it out... So something about the NPA, the Non Partisan Association, is filed under "p", for politics. Once you start to figure that out and that CUPE the Canadian Union of Public Employees is filed under "u", for unions, you begin to see how he described things.

(Colin Preston, Library Coordinator)

During this time the line-ups continued to be archived in paper format and are still an important part of the ability to find records from this time. Please refer to the video titled "Rolodex Search" in Appendix A for a presentation of a search using the Rolodex system.

4.9. The Electronic Database

The Rolodex allowed for new possibilities of user interaction at the same time as it maintained certain restrictions. Combining multiple drawers into a Rolodex and multiple, semantically related records onto single cards allowed quicker access to records. At the same time, the continued use of paper cards maintained other limitations in terms of available space for text and the reliance on the physical ordering of the main entry. It also imposed new associations by making relationships between multiple items when placing them on a single card. Rudy Penitsch's innovations and dedication to establishing and improving archival practices were instrumental in opening the system

up. On the one hand, it became possible to use the Rolodex system to conduct a search by topic in a way that was difficult or impossible with the drawer system and the practice of using the title or slug as the main entry. On the other hand, using the Rolodex effectively still required a certain amount of contextual and background knowledge. The potential for users other than the creator of the entries to find records was enhanced but still limited.

Card catalog systems are an example of what information theorist David Weinberger calls a second order data system: physical objects organized and arranged according to some kind of system to be used as pointers or references to other physical objects (Weinberger, 2007, p. 18). This can be contrasted with what Weinberger refers to as a first order system where collected objects themselves are arranged in a fixed physical order without pointers. In the early 1980s the archives at CBUT began taking the initial steps towards Weinberger's third order of organization: the replacement of relationships between physical objects with relationships between electronic bits of information (Weinberger, 2007, p. 19).

The first electronic database developed for the media library at CBUT was an attempt to bypass many of the limitations of the card-based, second order system. The introduction of a database allowed for new ways of searching through the collection at the same time as it imposed new kinds of constraints.

Our first database systems were implemented pretty soon after I started in ENG and any footage that I did want I've always tried to get it myself. It was a text-based sort of DOS terminal window ... (Michael Noonan, Editor)

The fixed field length meant that whether you had a 30-second or less voiceover or a 15-minute segment or a complete program, the number of character spaces that you had to describe it and its attributes and its visual qualities was fixed to that. You had to more or less edit yourself, edit your thoughts on the fly. Not edit your work, but your thoughts to cram your descriptions therein. So that was a real problem.

(Colin Preston, Library Coordinator)

In this case, the structure of the database did not enhance the user's agency or ability for search and retrieval. It was an arbitrary limitation created by accident rather than

design. Rudy Penitsch, who had made some substantial contributions to the information architecture at CBUT decided in the early 1980s to retire.

As you can imagine the early eighties kinds of software with fixed field lengths, limited field numbers, limited search capabilities, it was not something that was going to fit his mandate, his skill set. Whatever skills that he had learned in Austria and in Canada later that were a craft rather than a science, an art rather than a science. So he left at that point.

(Colin Preston, Library Coordinator)

During the early to mid 1980s a succession of employees moved through the position of media librarian¹⁹ until Colin Preston took the position in 1985. Preston had received a formal education in Library Science. Over the time that he has been working at CBUT the information architecture has grown into an effective resource that is much more open to users other than the immediate creator of the records. The changes at CBUT from the early 1950s through to the current day have been staggering in scope and magnitude. Throughout this time the information architecture shaped and was shaped by the intersection of increasingly diverse communities of practice and different technological configurations. The physical constraints of objects (paper cards, drawers, Rolodexes) and places (the room that contained the cards) were removed. Most importantly, the potential user-base in terms of search and retrieval was extended from a single individual, the media librarian, to anyone with access to the online database. This was achieved by the development of an information architecture based on the intersection of professional training and the practicalities of working in the hectic and harried environment of broadcasting. It involved structuring the data fields through the use of a standardized scheme as well as a system for data rules and values.

The metadata scheme currently used at CBUT evolved over decades. It started with the card systems and was adapted over time. As discussed earlier there is currently no commonly adopted data scheme used by broadcasters in North America. The

¹⁹ In this time it seems that the position of Media Librarian was used as a holding area for employees who were not working out in other areas. In some ways it was seen as a punishment. The records from this time frame were not accessioned using any kind of professional archival practices and are currently considered useless.

scheme used at CBUT, however, is interoperable to a certain degree within the larger data system of the CBC.

I tend to think that the field structure that we are using now, most of those features are workable. We have a set of, if not explicit standards, at least functional standards that we use from coast to coast to coast.

(Colin Preston, Library Coordinator)

Over the years the scheme used at CBUT has evolved and been adapted to several different types of technology. An example of the current scheme can be found in Appendix B. An example of a search using the online database²⁰ can be found in Appendix A in the video titled "Electronic Database Search".

The content of the metadata fields used at CBUT is also structured using a system of data rules and values. As outlined in a previous section there are no standardized data rules or values currently in use across the broadcasting sector. The authority file used at CBUT, however, is based on principles of data management from an Information Sciences perspective.

We have an authority list of names, reporters, personalities; it's like a telephone book. "Austen, Jack" ... "politics" what level of "politics"? "Federal government", "budget speech" is Jim Flaherty a fixed authority file? I doubt it because he hasn't been out here that much, "Harper, Steven" would be but "Flaherty, Jim" would not be... There's a hierarchy of terms so you can get to the very specific. The principle that I learned in library school is to index to the most specific level that you can.

(Colin Preston, Library Coordinator)

The authority file contains specific data values such as names, based on the use of data rules. The most common rule is to order surnames first.

In the authority file, the one that I use for names, that is both personal names of reporters and names of corporate bodies, it's surname followed by

²⁰ There are actually two databases used by employees at CBUT. Medoc is newer, and is the one most commonly used. Medoc offers searching of records in all CBC archives across the country. TVNLS is an older database that contains records from CBUT only. TVNLS is used mostly by the media librarians.

given name or names of corporate bodies.

(Colin Preston, Library Coordinator)

Data rules are also applied to shot descriptions.

We have a taxonomy of shot types ... because what you call a "medium close-up" and what I call a "medium close-up" might vary but at least in terms of the day in and day out cataloging and indexing it's a term that we can use interchangeably. ... So having that taxonomy and that level of describing it's very useful to us. You can cut through a lot of the garbage and nonsense and get to what people need.

(Colin Preston, Library Coordinator)

Specific data values are also applied using a standardized thesaurus.

In library terminology a thesaurus is by definition a hierarchical ranking of fixed terms, an authority file of terms. But then it establishes relationships you should point to; it is a subset of a larger entity... "First Nations of British Columbia" which then in turn is a subset of the larger "First Nations of Canada" then the larger set of which we now for the time being are calling "Aboriginals".

(Colin Preston, Library Coordinator)

A thesaurus allows for a lot of what we call switching terms. Some people might call that entity that takes airline flights in and out on a daily basis there on Sea Island "Vancouver International" some people call it "YVR". Is one better than the other? Well probably because YVR has only three characters for someone to key but it doesn't matter they should both point to the same conceptual entity and that's the joy and the creativity if you will of evolving a fixed and a controlled language.

(Colin Preston, Library Coordinator)

In 2008, the CBC implemented a standardized thesaurus across the country.

We have within the last half year successfully installed a national a network based thesaurus which we are welcome to use and as long as within each of our databases we turn the validation on it won't say no don't use this term this term does not exist etcetera. (Colin Preston, Library Coordinator)

The information architecture at CBUT consists of a structure of data rules, values and schema that the media librarians employ to catalog items. Another critical aspect of

the system is the use of automated processes designed to harvest as much good quality user-generated metadata as possible.

We have a great macro that runs every day. In the newsroom environment you have an automated script and line-up system to quickly change things and of course that ties in with desktop television in terms of the presentation. ... We have a macro that data mines all of that and pulls from that the slug, the length, the tape number, the intro whatever scripting is available... At a practical level doing a lot of things to allow us to transform already existing data and information in the news operation as a whole and applying it to the archival function.

(Colin Preston, Library Coordinator)

The most that can be automated the better. We live in a bilingual broadcast environment so the more things that will allow us to freely search or specific items or classes of materials that in our thesauri we call automatic switching the better. So whether I'm looking for "politics" or "politique" it should yield the same search results.

(Colin Preston, Library Coordinator)

The combination of automatically harvested user-generated metadata with descriptive metadata created by media librarians provides an effective system for users searching for material.

The project that I'm doing right now is not a biography but a story on the goaltender of the Canucks, Richard Brodeur. He's now a visual artist. ... Our archives were so valuable because we have everything from the moment he started his career to today. So I typed his name in our search engine and I got hundreds of tapes on him. Obviously, I can't look at them all but I have a short description that allows me to find out if I'm interested or not and I got everything I needed. (Pierre Beaudion, Producer, Radio Canada)

If I want to say look up Marilyn Monroe I would just put it in and up comes any reference to "Marilyn Munroe" or "Marilyn" and "Monroe". ... It's pretty good, even if I were to just say put in something like "environment minister", I would probably come up with a couple of hundred choices from the early fifties onward. As long as I narrow the range a little bit to a particular environment minister or a particular topic I can bring it down fairly quickly to 15 or 20 choices and that's easily manageable.

(Bob Nixon, Writer/Reporter)

The relationship between technologies, creative work practices and data structures is overwhelmingly complex. There are, however, certain patterns that do emerge over time when looking at the previous systems used at CBUT. Typically, a system is developed to handle large amounts of data. Once the system is established it supports a constellation of practices around it. These practices are maintained by both the technology and the users of the system. This most likely occurs because of the sheer volume of work that it takes to change a system once it gets going. The first media librarian attempted to introduce marginal change by grouping some records together loosely into compilation cards. The real impetus to change only came with a personnel change and the need to open the system up. The practices associated with both the drawers and the Rolodex were linked into many other considerations: the medium of film that was in use at the time, the typewriter used to make the records, the use of a telephone to contact the media librarian to name just a few. These systems also developed in parallel with the line-ups and the information that was made available through that collection of records.

4.10. The Digital Video Server

The installation of a digital video server in September 2007 at CBUT Vancouver inevitably shaped the process of constructing the news. Before the switch footage was shot, captured, edited, broadcast, and then archived using Betacam tapes and decks.²¹ The media librarians would go through the material on a daily basis using an analog video deck and then enter the data into a template, which would be converted by running a macro²² in Microsoft Excel. Material was accumulated on tapes and then filed in the storage area where they were made available for use. The only metadata that would carry through from the field tapes were: a short description (usually one or two words), the reporter's name, and the date. The media librarians would go through the footage on a daily basis (Monday to Friday) and enter information into the various data fields.

²¹ This was the workflow for the production of daily news items. Other kinds of productions, like documentary pieces or more in-depth features, had been digitized and edited using Avid systems for a number of years already.

²² A macro is a series of commands that can be recorded using Microsoft Word and can be carried out at a later time.

After the video server went online in September of 2007 the work practices at CBUT changed. Material was still being shot on tape²³ but was then brought to an ingest²⁴ station and captured. This digitized footage was then edited using non-linear editing software²⁵ instead of the previous linear tape-based editing process. Tape was still used as the medium for storage of material, meaning that the media librarians deposited Betacam tapes into the storage vault. Footage was captured in the field using analog Betacam tape, but after being ingested was kept on a server for one week only due to server hard-drive space limitations.²⁶ Although tape was still being used as the medium to obtain footage, they were ingested into the server and then erased for reuse automatically.

So a typical workflow is that a cameraman brings in the tape, it is ingested in real time onto the server and then it can be edited it can be viewed it can be shot listed.
(Michael Noonan, Editor)

A visual presentation of the cataloging procedures used after the installation of the video server can be found on the video titled “Server Based Catalog Workflow” in Appendix A.

Server space limitations require a regularly scheduled deletion of material to allow of the acquisition of new material. This necessitated the substantial altering of one of the media librarian positions. Please refer to the video clip “Server Management” in Appendix A for an exploration of the practices of the media librarian responsible for this task.

Well I've gone a whole technical about face. I do less shot listing and now I do more compilation of footage and management of footage. I mean it's a whole new ball game.
(Brenda Kilpatrick, Media Librarian)

²³ The switch to a non-tape format for recording footage is inevitable but, at the time of writing, this had not yet occurred at CBUT.

²⁴ The term “ingest” refers to the process of converting data contained on analog tape into a digital file, which is stored on a hard-drive.

²⁵ Please refer to the video in the Appendix titled “Video Server” for a fuller description of editing practices.

²⁶ In April 2008, the available space was six terabytes.

I clean up the database for desktop television. They also have me inputting and archiving archival material into the server. So I have to capture different pieces of video on this interface here called Avid Capture Manager.

(Brenda Kilpatrick, Media Librarian)

Coordinating and maintaining the digital files online became almost a full time job in itself. For example, problems arise around the way that videos are labelled for temporary storage on the digital server. When shots are ingested they are named with a system of nomenclature called the National Naming Convention—a standardized set of rules for naming digital video files. Denis Grenier, a cameraperson and editor for Radio Canada has taken on the responsibility for training other employees to use the new system.

I call it the seven-day glitch or the seven-day hitch. People will go along, it's all good for five days. They go away for the weekend, they come back on Monday they are still good, Tuesday they are good. Then Wednesday suddenly it slides, the national naming convention goes. They name things willy-nilly you got to push them back in the right direction.

(Denis Grenier, Cameraperson, Editor)

Editing switched from an analog process using two beta max decks to a digital process using non-linear editing software. Significant changes also occurred in the control rooms used for coordinating the broadcasting of television content. News stories were played out to air using sophisticated software to organize digital video files instead of live switching from tape decks. Ultimately, this allowed for the elimination of many positions in the control rooms. A typical nightly news broadcast might have required up to eight people in the control room. After the switch to digital playback it became theoretically possible for one person to operate the control room.

The main change of practice for the media librarians was that they were able to use non-linear video software to *scrub*²⁷ through the daily shoots. Previously, going through videotapes in a linear fashion took much more time.

²⁷ Scrub is a technical term for the action of using a mouse to move a play-head quickly through a clip of digital video. It is similar to the conventional terms “jogging” and “shuttling”, but is different in that the access to a clip is truly random.

This for us as content managers is a fantastic opportunity because of course you can scan any kind of file, textual, data, sound or image [and] quickly scroll through it, mark points that you want to retain. This is because we have access to a non-linear edit suite . (Colin Preston, Library Coordinator)

The ability to rapidly scrub through footage available on a server provides the possibility for the archival team to significantly enhance the service they provide. They have been able to expand the range of material that they can meaningfully view in order to make decisions about whether to keep the footage or not.

We've made this transition to this so-called digital archiving where we're managing our content as close to the time of production as we can. ...We are able to go digitally into the sequences that were cut to explore the other bits and pieces that were added to it and make a decision then and there as to whether we are going to retain or add ancillary material to what the public saw on the air that night. (Colin Preston, Library Coordinator)

Before when you edited a story it was on an edit pack and then an editor would add a whole bunch of story and when the edit pack was full you put it on the shelf. Now, we just send things out by computer so the archivists are in charge of keeping all the stories. So they archive them in a different fashion. The workflow has changed.

(Denis Grenier, Cameraperson/Avid Trainer)

In terms of the data fields that were being filled out on a daily basis, however, there was very little change. The same fields were being used with basically the same procedures. The ability to scrub through footage was a major change in terms of daily work practice but not in terms of changes to data rules, values, or schema.

It is clear that the addition of a video server has somehow played a role in changing the workflow at CBUT. The cataloging of previously unused B-Roll²⁸ footage provides new possibilities for telling stories.

A perfect example is a kind of a throwaway item from Tuesday, which was presented on Monday. It was about this glorious all too short bit of sunshine

²⁸ B-Roll footage refers to material that was filmed to provide visuals for a news story, which may or may not be used in the actual news item.

we were having... The light was kind of an ambient gold, there was a real diamond-like sparkle on the not choppy, not still, kind of in-between just shimmering waters of English Bay. The cameraperson framed a palm frond in the upper corner so you have a golden cast which you don't normally associate with Vancouver ... it was a wonderful shot.

(Colin Preston, Library Coordinator)

In this case, non-linear editing capabilities and the use of digital video files stored on the server provided the possibility for a change in the archival workflow. Please refer to the video clip "B Roll Enhancement" in Appendix A for further exploration. Material is being preserved and made available to users that was previously discarded. Of course, not all possible changes to archival procedures will lead to an enhancement of agency or the ability to tell stories. It is entirely possible that technology could be used in a way that limits the possibilities for news stories.

Currently, the weight and momentum of previous practices are acting to prevent any major shifts in the information architecture at CBUT. The structure provided by the data scheme, rules and values is essentially the same as it was before the switch to the online server.

Just recently they've installed an Avid Isis system whereby all the video is ingested onto a central server and we edit off a central server. At the moment I would say that we're just using it as a replacement for a tape based system in that our workflow. We haven't looked at the ramifications of not having tape.

(Michael Noonan, Editor)

The extraction process for user-generated data has been adapted to the new configuration.

We are using ... a melding sort of line-up presentation software, an amalgam of spreadsheet and word processing information. ...What it does now because we're tied into a non-linear editing situation is assign true metadata, that is TapeID and the like and you can parse out those codes, TapeID that begins with a 12 is something that is produced for the noon 12 o'clock show.

(Colin Preston, Library Coordinator)

It is likely that the switch to using digital video files from a centralised server will continue to play a major role in shaping the work practices of the media librarians. Exactly how this will occur is difficult to predict. The introduction of a digital video server at CBUT creates the possibility for radically different workflows. For example, journalists and camera operators could attach descriptive metadata to their footage that could then be passed into the archival records. The reality is that the pace at which these kinds of changes occur is much slower than I had anticipated. There were differences, of course, but the basic system of data values, rules, and schema remained intact. At this point, none of the responsibility for inputting descriptive metadata beyond what was automatically being extracted from the scripts and line-ups was passed on to positions other than the media librarians. In the next chapter I will explore the possibility pointed out by media librarian Brenda Kilpatrick who stated:

Anything that can automate everything but the shot list is helpful. And then of course someday they will find some way to get this kind of information into the system bypassing the librarian but that hasn't happened yet.

5. Narrowing the Semantic Gap: Folksonomy, Taxonomy and Pace-Layering Theory

It is clear that the use of a digital database to create, organize and manipulate metadata changes the way that records are accessed in an archive. Electronic databases remove some of the constraints of records composed of physical objects arranged in fixed patterns. According to David Weinberger:

Content is digitized into bits, and the information about that content consists of bits as well. This is the third order of order and it's hitting us—to use a completely inappropriate metaphor—like a ton of bricks. The third order removes the limitations we've assumed were inevitable in how we organize information.

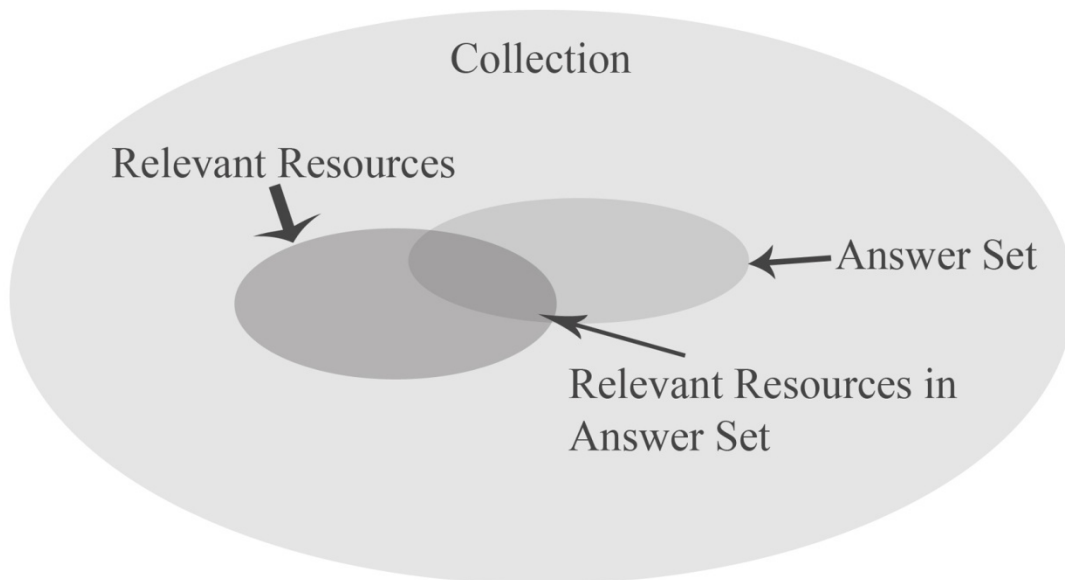
(Weinberger, 2007, p. 19)

A search for material conducted using the drawer system will most likely yield results that differ from the same thematic search using an electronic database. Conducting a search in a database is a probabilistic activity. A finite set of resources exists in any given collection. When searching for a resource there is a potential set of relevant results that coincides with what the user seeks. The answer set that is produced by the search criteria and use of metadata may or may not overlap with the set of relevant resources that exist in the collection. The difference between the relevant set and the answer set has been referred to as the semantic gap (see Figure 1). According to Smeulders, Worring, Santini, Gupta, and Jain (2000):

The semantic gap is the lack of coincidence between the information that one can extract from the visual data and the interpretation that the same data have for a user in a given situation... The pivotal point in content-based retrieval is that the user seeks semantic similarity, but the database can only provide similarity by data processing.

(p. 1353)

Figure 1. The Semantic Gap



Note. Adapted from Reusch (2001, p. 220).

Information systems, in the most basic sense, link experiences across different times and places through a system of representation (Bowker & Star, 2000, p. 290). The concept of semantic gap is a measure of the effectiveness of a system in this regard. Shifts in the data field structure, and the practices used to access these records alter the probability of particular media resources being incorporated into news stories. If a current user were to attempt to access records using the drawer system the semantic gap would be large. The link between current experience and the cultural records contained on newsreels from the 1950s would be minimal because of the lack of coincidence between the footage, the title of the piece that contains the footage and the experiences of the current user.

Shifts of technology can also alter the chances of material being used in news stories. If a current user were to try a search using the Rolodex system there would be less of a semantic gap than with the drawer system. This is in part because the cards were arranged alphanumerically using a classification scheme of semantically related news items but it is also linked to the structure of the Rolodex. The Rolodex allows a user to search across multiple categories as the user turns the device to find specific

records. This allows the user to become familiar with the subject headings used at the same time as it allows faster search times. The difference between the Rolodex system and the drawer system is subtle in this regard. Opening and closing drawers can be a frustrating and thereby limiting experience. It would have also been easier for the media librarian to make changes to the Rolodex system. Adding a new category to a drawer system might necessitate the shuffling of cards into new drawers or moving the drawers around. New records could have been continuously added to the Rolodex with far less shuffling of cards.²⁹

All three of the archival systems examined (the drawers, Rolodex, and the current electronic database) were created by specific human actors. The data field structure, the technology and the particular person occupying the role of media librarian tended to shift together. The current electronic database was implemented in 1989 under the guidance of Colin Preston, the current Library Coordinator. As described in the previous chapter, he implemented a data scheme and a system of data rules and values based on his training in the Information Sciences and the specific requirements of the broadcasting environment. The adoption of academic and industry standards allows for users other than Preston himself to use the system. The semantic gap has been lowered dramatically as a result. The use of taxonomies and controlled vocabularies allow multiple users to make connections between records and the audio and visual material they point to. The video clip titled “Computer Search” in Appendix A explores how journalists effectively use this system to find material to support their stories.

The narrowing of the semantic gap is also connected to the use of networked computers. The records are available on line, CBC employees from across the country or across the building can search for material contained in the media library at CBUT. Users can employ Boolean operators across the text in all fields not just a main entry field like “title” or “subject”. They can save their searches for future comparison, change the way that records are presented, share their search results with other employees, all from their own desk. Over the years the media collection at CBUT has steadily grown. The information structure has evolved as well. It has emerged at the intersection point of

²⁹ The records ended up being distributed across two Rolodex devices as the collection grew. This is still much easier to organize or change than 35 separate drawers.

multiple users attempting to access and to provide access to audiovisual material. It is the result of complex negotiations between humans and technology over decades of work practice.

The installation of the server and consequent adoption of a non-linear, digital workflow has the potential to disrupt this set of work practices. This is not to say that the structure and content of the data fields used by specific communities of practice are determined by the technologies used alone. There are many actors at play. A new media librarian, for example, could just as easily undermine the system. The introduction of a new actor presents an opportunity to change workflows. It is possible that in order to improve efficiency and cut costs pressure will be exerted on camera people, journalists and producers to input their own metadata. While this was possible in the pre-digital era it was not embraced as a practice. Now that audiovisual materials are available online, it might seem like a small step for users to tag the footage they work with. Networked user-generated metadata has the potential to short circuit the current archival infrastructure that has been built up over almost 60 years of development.

5.1. Folksonomies

The current method of cataloging material at CBUT Vancouver archives is a hierarchical process. To varying degrees thesauri of subject-classified metadata coding schema and classification schemes have been employed to support a taxonomy. This taxonomy evolved over decades in the intense, deadline driven environment that accompanies the daily news production cycle. It encapsulates a set of work practices at the intersection of human actors, technology and information systems. We are now at the point, however, where changes in technology can support entirely new kinds of digital asset management paradigms.

The potential benefit of employing user-generated tags to power a folksonomic³⁰ information system is an example. One of the promises of implementing digital asset management systems in broadcasting is that the upfront costs can be recouped by

³⁰ Please refer to the discussion of “folksonomy” in Chapter 2 for a definition of this term.

improving efficiencies in the workflow. Tasks could be redistributed in ways that avoid redundancies and maximize use of labour time. The semantic gap could be decreased by ensuring that the search terms used by local actors are represented in the national system. On a broader philosophical level there is an argument that folksonomies are inherently democratic. They allow freedom from the constraints or structure of a classical top-down taxonomy. According to David Weinberger (2005, p. 83), "In the third order of order, knowledge doesn't have a shape. There are just too many useful, powerful, and beautiful ways to make sense of our world." Tagging as a strategy for dealing with large amounts of quickly changing data offers many potential benefits. Information environments where tagging is employed tend to be collaborative and participatory, the use of tags can enhance findability, and also help focus on how people use resources (Smith, 2008, p. 37).

The argument can certainly be made that folksonomies work well in certain situations. Applying this concept specifically to a broadcasting environment, however, is a different story. If upholding lofty democratic ideals while at the same time saving money sounds too good to be true then it probably is. When it comes right down to it, there are many aspects of folksonomic systems that could prove disastrous to the functioning of a broadcast media library. The term messy, for example, is a pseudo-technical term used by information architect Gene Smith to sum up a major problem with the use of tags. Messiness refers to tags with syntactic problems, lack of patterns in the tag set and multiple versions of the same tag (Smith, 2008, p. 56).

I think the main challenge for any archivist is consistency of keywords....If you call something "yard" in one clip and then "garden" in the other clip there is no way to find [those clips] except [to type] "ard" and then you would get so much stuff you would never be able to find it. That means you would have to do your research twice. Whatever keywords you use, somebody might call it "horticulture" someone might call it "agriculture" all those words cover more or less the same thing so if you are not careful about how you name your clips or your material you will never be able to find certain things.

(Kris Flerackers, Production Editor)

In 2001, Cory Doctorow wrote a straightforward critique of the use of metadata. In "Metacrap: Putting the torch to seven straw men of the meta-utopia," he points out that the average metadata creator is lazy, stupid, dishonest, and self-ignorant. Doctorow

(2001) didn't pull any punches; his critique is pessimistic verging on insulting. At the same time his assessment of the ability of average users to create reliable metadata is worth considering (Smith, 2008, p. 87). In a professional environment that relies on information systems messiness could end up costing much more than the potential benefits. Peter Morville, author of *Ambient Findability*, states that the inability of folksonomies "to handle equivalence, hierarchy, and other semantic relationships cause[s] them to fail miserably at any scale" (as quoted in Weinberger, 2007, p. 166).

As I've stated, sometimes you don't have the time to properly catalog... and that's a slippery slope. It gets you the instant product that you can present but if you are doing a story or a group of stories that will require you to go back to some of that content if it's not labelled properly, if there's no reference to shot lists ... that sort of marking, you risk losing that forever.

(Scott Stewardson, Manager of TV Production Services)

Quality metadata takes time and effort to produce. Doctorow's (2001) frank assessment of the average user's willingness to take the time to create metadata is obviously an issue to be taken seriously. It is possible that users working in a professional environment would take more care. The problem is that in the intense deadline-driven world of news production the creation of metadata would be a low priority. In the following quote an experienced editor doubts that positions other than media librarians could be expected to generate descriptive tags:

I think in a news operation the major responsibility is to get the story to air. And because it's such a short time frame I would think that any entering of metadata is not going to happen because people are scrambling.... I would think that the people that are involved with the news on a day to day basis, be they producer, reporter, editor, would probably be busy doing their present jobs... So I don't see how they could be expected to do any inputting of any metadata.

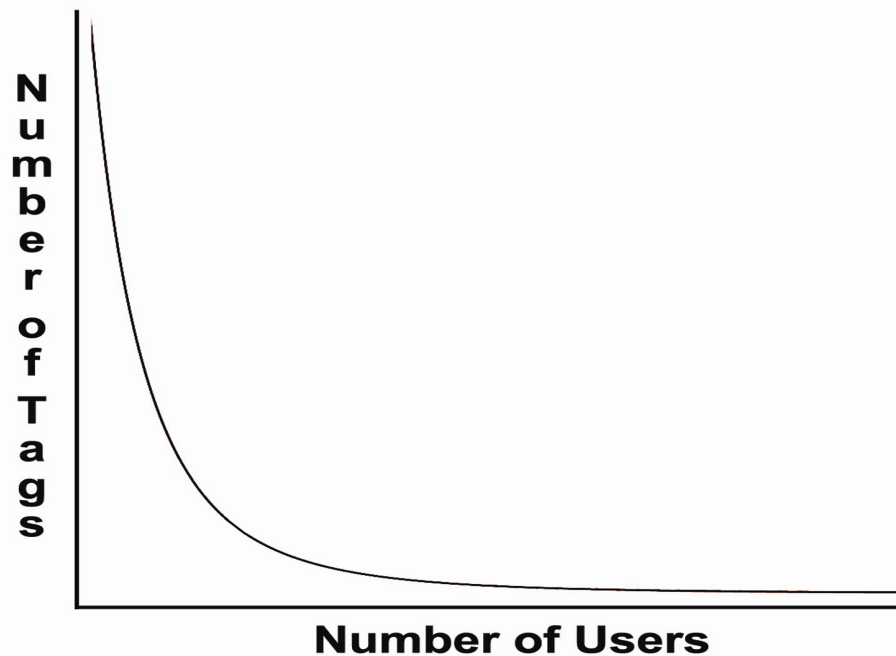
(Michael Taylor-Noonan, Editor)

Producers and reporters are constantly under pressure to meet deadlines. Adding in the extra responsibility of meaningfully tagging footage would most likely result in low quality descriptive metadata that does not decrease the semantic gap.

Another potential problem of using a tagging system in a broadcasting environment is the variation with which different actors are willing to create useable

metadata. This has been shown to be an application of the power law. The power law is a distribution of probabilities that typifies user-generated data over large populations (Smith, 2008, p. 53). In a study conducted by Halping, Robu and Shepard (2007) bookmarks from the tagging driven site del.icio.us³¹ were analysed. It was found that a power law curve consistently emerged for each resource. Generally, it has been found that a very small minority of users generate the vast majority of online metadata (see Figure 2).

Figure 2. The Power Law



At first this might seem unimportant, as long as the requisite amount of metadata is generated the system can grind along. But what about the utopian belief that hierarchical systems are oppressive tools of repression while open systems like tagging are inherently democratic and liberating (Wright, 2007, p. 7)? If the power law were to hold in a workplace situation where a disproportionately small number of actors generate most of the metadata then this benefit would disappear. We would be left with metadata that is not truly representative of the attitudes and dispositions of the majority of the

³¹ The social bookmarking site del.icio.us has changed its name to “delicious” and can be found at <http://delicious.com>.

employees at CBUT. If the power law curve were to present itself in a system of tagging the tags of a minority would dominate the information environment. This can also be related to what Psychologist Robert Cialdini calls “social proof” or the tendency of actors to base their determinations of what is correct on the opinions of others (in Smith, 2005, p. 28). In a folksonomic system based on tagging this could lead to a habit of adopting other people’s tags instead of their own.

Another consideration is that some actors might try to influence the system for their own gain or as a vehicle for expressing their discontent (Smith, 2008, p. 59). LibraryThing’s³² Tim Spalding refers to these types of users as “bad actors”. This kind of problem would obviously play out in a different fashion in a workflow system not open to the general public. Nonetheless, it is still important to consider the problem of malicious intent or even just misleading intent in a potential tagging system.

Messy data, bad actors, disproportionate levels of user input along the lines of the power law—these are all potential problems with a user-generated archival system. Perhaps most importantly, however, are considerations of the consequences of downgrading a set of tasks previously carried out by professionals.

I would think it would cost them more in the end because I as a writer making x dollars an hour am not going to do this work for free. I’m busy enough it’s not going to happen before my day is over which means that you are going to pay overtime for something that can be done way more accurately by somebody that knows the archive system.

(Paul Heeney, Senior Writer)

A key factor in the acquisition process is the ability of a trained professional to assess the potential future relevance of footage based on context and experience.

I don’t think just in terms of visuals and the quality of the visuals because that’s how editors are going to think... I want to think sometimes a bit further about the news itself and history and what we will remember in 10 years.

(Marie-Helene Robitaille, Media Librarian)

³² LibraryThing can be found at: <http://www.librarything.com>.

According to information architect Lou Rosenfeld, tagging systems don't "support searching and other types of browsing nearly as well as ... controlled vocabularies applied by professionals" (quoted in Smith, 2005, p. 14). A dedicated and properly trained media librarian will most likely have a clearer understanding of the whole range of options offered by an established classification system and the traditions of its use in cataloging. The practice of retrospective enhancement of records, for example, demonstrates the importance of disciplinary knowledge of different fields of practice and subject areas.

A perfect example of that would be when Pickton was busted in 2001 or 2002, but what about all those stories of missing women that came beforehand? Well, it's useful to go back and tag his name to those other records. We do a lot of that retrospective enhancement of records.

(Colin Preston, Library Coordinator)

This practice would be difficult in a tagging system as no one person would have the imperative to carry out such an operation. Also, without a true taxonomy it would be impossible to know if a search of tags on any given subject was exhaustive or not.

There's much to be said about user-generated data and even our workflow harvests a lot of that ... Someone has already been paid good money to generate it so who would not want to use it. But then you have the push back of you know the other side ... what happens when you want to look at something historically, what happens when you want to look at something sequentially over time.

(Colin Preston, Library Coordinator)

It would be possible to find some records on any given subject and retrospectively add more tags but this operation would require massive amounts of time and effort.

I think there's a danger of some of the managers here or even some of the producers because they are so geared toward news production that they forget about the historical perspective... We are a bit more distant I associate words differently in my mind.

(Marie-Helene Robitaille, Media Librarian)

5.2. Taxonomies

A folksonomy built purely on user-generated tags in a broadcasting environment would most likely lead to an increase in the semantic gap—a decrease in the ability of users to find relevant material. On the other hand, taxonomies are never perfect either. The Dewey Decimal system, for example, is notorious for preserving attitudes and perceptions of reality that are “embarrassing in the modern era” (Weinberger, 2005, p. 48). According to Weinberger:

The Dewey decimal classification system can't be fixed because knowledge itself is unfixed. Knowledge is diverse, changing, imbued with the cultural values of the moment. The world is too diverse for any single classification system to work for everyone in every culture at every time. (p. 57)

Bowker and Star (2000, p. 319) in *Sorting Things Out: Classification and Its Consequences* make the argument that classification systems are powerful technologies that become embedded in working infrastructures. An extreme example of the power of a taxonomy to form reality with negative consequences was the use of racial categories in South Africa under the apartheid system. Legislation passed in 1950 required that all citizens be classified by racial group. This classification was then used to legally restrict the basic rights and freedoms of citizens (Bowker & Star, 2000, p. 196). The power of an established taxonomy lies in its deceptively neutral and objective nature. Once woven deeply into everyday practices and attitudes they become difficult to refute. In reality, systems of classification are inherently arbitrary and often used as tools of political power and authority.

Examples of the arbitrary nature of taxonomies can be found everywhere. The “NewsCodes” used by the International Press Telecommunications Council to categorize news stories is a perfect example. The category of “cinema” contains a single entry—“film festival” while the category of “sailing” lists seven different types of dinghy races (Weinberger, 2005, p. 89). It is possible that the attention given to sailing as opposed to cinema is purely accidental or harmless. It is also possible, however, that it speaks to the power and privileges of a leisure class of people who engage in sailing to have their stories told in the news items that permeate our everyday experiences.

As outlined previously, digital asset management systems allow the sharing of electronic information through computer networks. This inevitably puts pressure on data systems to move towards interoperability through the use of standardized data schemes, rules and values. The use of a controlled thesaurus, for example, can lead to an increased chance of users finding relevant material. The semantic gap decreases as the rate of coincidence between terms that searchers use and the terms that are used to catalog items increases. This is accomplished by limiting the total number of terms used. But if the terms of a controlled thesaurus are out of touch with the terms used by the users of an archival system, the semantic gap could actually increase.

Historically we have lots of stories about herons. Pictures of herons, features about herons and I think herons is a good term to have. For some reason the network thinks that it all belongs under the rubric "waterbirds".... There are a lot of local terms that may not be applicable anywhere else but I think are very important to keep here.

(Colin Preston, Library Coordinator)

This clash between regional and national terms highlights some potential problems with an information system that is too rigid. A reporter, for example, using the system to find material related specifically to "herons" will be confined to using the search term "waterbirds". This increases the work required to find records and as a result decreases the chances of incorporating material related to herons. In other words, the vocabulary in common usage by a local community of practice is out of synch with the controlled vocabulary of the national thesaurus.

We're negotiating constantly. We suggest new terms, there's acceptances rejections. ... "Oilsand" or "tarsands", well first of all is "oilsands" one word or two? Or "tarsands" or all of them? ... I would think that the person that's there handling that content should have primacy in determining what that phrasing should be in a thesaurus.

(Colin Preston, Library Coordinator)

The conflict between local and national terms could intensify as the scope of the system is extended. Adopting a controlled vocabulary that is international in scope could make it increasingly difficult to use cataloging terms that serve the interests of local users. Diversity would be sacrificed in the interest of interoperability.

If media archives around the world move towards standardized data schemes, rules and values interoperability will be enhanced. At the same time this will also fundamentally alter the way that archival resources will be accessed and used in news stories. In many ways the agency of users would be enhanced by the ability to tap into larger, networked collections of archival material that use a common vocabulary. At the same time, this structure could place limits on the probability of finding certain kinds of media assets, for example, those using local terms or vernaculars. Small changes made to data schemes, rules and values would be amplified throughout the entire system. The SMEF Data Model used by the BBC contains a data field labelled “ATY_Name” (SMEF Data Model v1.10, see Standard Media Exchange Framework, n.d.). This field contains the name of a specific alert type that can be applied to a media asset. Possible values for this field include: “disturbing content”, “offensive language”, “sex”, “violence”, “nudity”, “discrimination”, “illegal drugs” and “strobing”. A future release of this data model could just as easily introduce the category of “politically offensive”. This one field, embedded deeply into an incredibly complicated data scheme, has tremendous power to dictate what can and can’t be seen by viewers of the BBC. Related fields include effective start and stop dates. A simple upgrade of the data model could carry the hidden baggage of a political agenda.

The purpose of an archival search is to ignore or filter material that is considered irrelevant to the searcher. In the field of television broadcast journalism, however, the systemic exclusion of material deemed offensive by an individual or a group can be quite problematic. Historically this kind of knowledge was distributed across many thousands of actors using separate information management systems. Every archive has biases built into its data structure. The presence of many unique systems each with its own biases helped to ensure diversity. If the goal of interoperability were taken to an extreme we would have one global metadata scheme for all broadcasting archives with common data rules and values.

Censorship involves the enforcement of a system that drastically reduces the probability of accessing censored material. The same can be said for attempts at revisionist history, the *cleansing* of archival records to reflect a certain viewpoint. A new kind of revisionism becomes possible using hierarchical schema. Subtle manipulations of interconnected digital asset management systems could radically alter the information

landscape without the excessive drama of a book burning or propaganda stunt. Obviously, censorship was a concern long before the development of electronic databases. Any particular information architecture won't cause censorship or revisionist history but it could afford new and powerful possibilities to control information and ultimately limit the agency of users to create news stories.

5.3. Pace Layering Theory

Top-down, hierarchical taxonomy versus bottom-up, open-ended folksonomy, each have their strengths and weaknesses. Ideally, it would be possible to keep the strong points of each system—but is this possible? A spectrum of opinion exists amongst information specialists. In a heated critique of classical ontologies Clay Shirky (2005) takes the position that the relationship between tagging and classical information systems is inherently antagonistic. He claims that folksonomies constitute a “radical break with previous categorization strategies, rather than an extension of them” (Shirky, 2005, ¶3). There is no doubt that tagging represents a distinctly different way of approaching the problem of managing large media collections. At the same time, ruling out the possibility that folksonomies could coexist alongside classical taxonomies is extreme. Peter Morville takes a different approach. In his book, *Ambient Findability*, Morville (2005) examines the potential for user-generated metadata as a supplement to existing ontologies (p. 141).

Morville (2005) employs pace layering theory to demonstrate the synergistic potential of tagging systems. Pace layering theory was originally developed by Stewart Brand as a framework for examining buildings (Brand, 1994). A building seen in this way is composed of many different layers. Each layer is defined by the speed at which it changes. Fast moving layers like the exterior or furniture layouts can change at a relatively quick pace when compared to a slow moving layer like the foundation. The central tenet in pace layering is that different rates of change are beneficial for the overall development of complex systems (Brand, 1999). Quick moving layers innovate while slow layers absorb and stabilize. According to Morville (2005), “Taxonomies and ontologies provide a solid semantic network that connects interface to infrastructure. And the fast-moving, fashionable folksonomies sit on top: flexible, adaptable, and responsive to user feedback” (p. 141).

User-generated tags constitute a fast moving layer. As a stand alone solution tags won't meet the exacting requirements of the nightly broadcast news grind. It's also unreasonable to expect that camera operators, producers, journalists and editors could find the time in their already packed schedules to produce reliable metadata. On the other hand, it is possible that some user-generated data could help to enrich the data structure rather than subvert it. Instead of wasting potential metadata, which took time and ultimately money to produce, it may be possible to use them as a supplement to the existing information architecture.

Any changes to the information architecture in a complex working environment like CBUT Vancouver would need to proceed with extreme caution. The large and slowly changing rhythm of the current architecture contributes to the preservation of memory within the system (Campbell & Fast, 2006, p. 8). It is possible that tagging—a quick moving layer of information—could destabilize the structure and cause irreparable damage.

What happens if somebody's purchasing this stuff and it's not exactly what they were looking for ... When somebody in an organization comes in to buy something from another one, it's archivists talking to archivists. It's not the PR guy saying send me this, it's somebody that knows the language. Here is what to expect here is how it works. ...Here's the rights holders information, here's copyright information, here's what it will cost you to do it ...

(Paul Heeney, Senior Writer)

Over the years at CBUT technology, work practices and information systems have co-evolved. The position of media librarian has shifted along with the technical and information environment. It might be tempting to think that knowledge professionals could be replaced by workflows that make more efficient use of technology and labour. In fact, as the information environment increases in complexity skilled information architects become much more important than they ever were in the past. Investing more resources into units that manage information could pay large dividends in terms of workflow improvements and increased ability to utilize and sell repurposed material. CNN's business model is a perfect example. Kueng-Shankleman lists repurposing as CNN's second "core competency" (the first being the gathering of breaking news)

(quoted in McCargar, 2004, p. 26). By the mid 1990s more than a third of CNN's revenue was generated from the selling of repurposed content (McCargar, 2004, p. 26).

Increased resources would allow media librarians to tap into new data sources. In terms of a pace layering model these sources exist at many different levels. For example, tags that journalists, editors and producers use to organize their information as stories develop could be kept and passed through to the media librarians. An even faster moving layer of metadata flow would be data from the searches conducted by users as they seek out footage. As fleeting as this information is, it could provide a valuable feedback mechanism to the controlled thesaurus. The value of a controlled thesaurus lies in its stability. However, it also needs to coincide with the terms that users tend to employ in their searches and the nature of the content that it is characterizing.

What is the lingua franca of a given moment can become a stilted anachronistic term. Particularly now our culture is one of neologisms right, left, and centre. A new term begins to change, it evolves, so "cellular telephone" become "cellular phone" becomes "cell phone" becomes "cel".

(Colin Preston, Library Coordinator)

The semantic gap widens when the controlled thesaurus in use by media librarians is out of touch with the community of practice that it serves. A running tally of the most popular search terms could be a useful way to help decrease the semantic gap by using it to make changes to the controlled vocabulary.

There are many other possibilities for safely incorporating user-generated data. This is not an attempt to provide an exhaustive set of recommendations. The point is to illustrate that this kind of user-generated data is potentially valuable as a supplement to the existing information architecture. From a pace layering perspective the issue is not whether to utilize the metadata generated by fast moving layers like user-generated search terms but rather how to incorporate it into the structure in a way that doesn't do damage to slower moving layers like controlled thesauri and data schemes. In order to utilize user-generated data and at the same time maintain existing functionality, information architects will play a vital role in negotiating and monitoring the complexity (Campbell & Fast, 2006, p. 8).

The value of using a historical analysis of a data architecture to provide a basis for making future decisions demonstrates the value of keeping records of the past. The first media librarian at CBUT was an insider to the community of practice that he served. He developed a system that wasn't extendible beyond the narrow limits of that particular culture in space and time. It depended heavily on a background knowledge of the titles or slugs of news pieces. The second librarian came from the outside and was pushed to develop a system that could extend out to much wider communities of practice. Under Colin Preston's direction the electronic database flourished. It is currently at a balancing point of fixity and fluidity that allows users at CBUT to engage with a unique and incredibly comprehensive resource. As the workflows and practices at CBUT change and evolve in the next years so will the needs of that community of practice. The goal is to develop practices that embody not only the composition of the community of practice within which they currently operate but are able to extend these boundaries in space and time so that a user 50 years from now will be able to look back meaningfully at our time.

6. Conclusion

In ancient Greece the word *arkheion* was used to describe a house or residence of elected officials known as Archons (Derrida, 1998, p. 2). *Archons* were vested with the authority to make or interpret the law with the help of stored documents and artefacts. The media archive or library at CBUT Vancouver may not function in quite the same way as the original Greek *arkheion*—as a storehouse of legally binding documents—but aspects of the core idea remain. In many ways it is a place of authority combined with the power to gather, organize, preserve and interpret signs integral for the functioning of a group or society (Derrida, 1998, p. 2).

A public broadcasting archive carries the responsibility of preserving and disseminating memories of the past. Its power is subtle but real, since the power of the archive to shape television news manifests itself every time stories based on archival material are broadcast to an audience. The potential of the archival collection at CBUT to intersect with current cultural and social networks or fields is interwoven with the metadata fields that are employed to organize and access the material. Kenneth Haase (2004) presents an interesting model that looks at the value of content versus the value of metadata. According to Haase, the value of content is diminishing as the value of metadata rises. The sheer volume of available material in archives necessitates an extensive information layer. This layer provides access but can also act as a gatekeeper to restrict access.

The structure and content of metadata fields is shaped by human agents, information architecture, and technology. The outcome will be formed by all of the actors involved and yet will be solely reducible to none of them. For example, a folksonomic archival system would have been possible to implement using the purely tape-based system. The likelihood of this occurring, however, would have been very low due to the momentum of practices built up over decades around the constraints of previous technologies. The digital video server has the potential to shape future archival practices at CBUT but does not determine them. It simply introduces another actor to the process which in turn alters the probability of outcomes.

The fluctuation of probabilities set in motion by the digital video server alters the possibilities for new archival workflows. This does not mean, however, that all of the possibilities are desirable. The concept of downloading the responsibilities of professional archivists onto other positions in the production chain using a folksonomic metadata system needs to be evaluated extremely carefully. It is possible that a move in this direction could cause irreparable damage to the information architecture currently functioning at CBUT Vancouver.

If the outcome of the implementation of new technical configurations is not predetermined is it possible to make any kind of prediction about the future implication of such changes? In this thesis I have argued that it is possible to use an ANT perspective to move beyond dualistic thought patterns that hinder our ability to make complex judgements about the relevance of technical change. The practice of not making a *priori* judgements about the interaction of humans and technology does not hinder the ability of the researcher to make assessments of complex phenomena. It simply clears the way for the detection of meaningful patterns as they occur. The use of pace layering theory offers a practical strategy for managing archival records that ignores the boundaries of the dichotomies of folksonomy versus taxonomy, network versus hierarchy, and ultimately agency versus structure. It is possible to envisage a similar layering strategy that extends to the epistemological and ontological aspects of the research process.

The future value of a collection like the CBUT media library will be based on the quality of the metadata available for search and retrieval functions. Organizations charged with the task of conserving and maintaining access to vast numbers of diverse media assets are being forced to confront an incredibly difficult task, filled with moving targets, intense complexity, and real consequences. In the particular context and work environment at CBUT Vancouver the best quality metadata will be produced by a team of dedicated professionals who can manage incoming metadata from multiple streams as well as provide their own enhancements.

The field of television news production is driven by the imperative to meet deadlines and yet maintain high standards of accuracy and fairness. An information architecture that works for an online book company may or may not work in a broadcasting environment. Workflows built up over decades of practice could change

suddenly with unforeseen consequences. Exactly how these changes will impact broadcasting archives and the news production process are difficult to predict. That being said, the lack of a crystal ball doesn't render investigations into this area futile. It is possible to identify patterns in the chaotic world of media broadcasting that are more or less likely to occur. Following patterns over a continuum from past to present can help build a framework of understanding for managing uncertainty and providing a baseline for future decisions.

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Appendices

Appendix A.

DVD

The DVD attached forms a part of this work.

It can be opened from a computer with DVD player software.
It will not play on a regular DVD player.

Appendix B.

Data Scheme Currently in Use at CBUT Vancouver

<i>Responsible (RES)</i>	Indicates the area that is responsible for the data record. e.g., NNL, the National News Library; OB, Ottawa Bureau. Click here for a complete list of RES codes.
<i>Information Type (IT)</i>	Indicates the type of information stored in the record, e.g., DNN, CT. Click here for a list of allowable IT codes.
<i>Information Level (IL)</i>	Indicates the level of information stored in the records. Allowable codes for this field are I (Item) - for items of Daily Network News; S (Segment) - for segments of News Special, Current Affairs daily show, and Cumulation Tape; P (Program) - for all of a program.
<i>Aired/Non-aired (ANA)</i>	Indicates whether the item or segment is aired or non-airied. Legal codes for this field are AP - aired/program; AF - aired/feeds, newsfeeds or special feeds; NA - non-airied.
<i>Program Title (PT)</i>	Contains the title of a daily network news program, e.g., The Journal, The National.
<i>Program Sub-title (PST)</i>	Contains the sub-title of a program if one exists.
<i>Show/Program number (SN)</i>	Contains the unique number (corporate accounting number) assigned to each News Special or Current Affairs daily show. Format is 000-0000-0000.
<i>Show Broadcast Date (SBD)</i>	Contains the show's initial air date. Format is YYYYMMDD.
<i>Show Broadcast Time (SBT)</i>	Contains the time of day the show was initially aired. Format is 00:00:00.
<i>Show Broadcast Day of Week (SBDW)</i>	Contains the day of the week the show was initially aired.
<i>Show/Program Announcers (SA)</i>	Contains the names of the show/program announcers.
<i>Cumulation Tape Title (CTT)</i>	Contains the title of the cumulation tape, e.g., event title for host broadcaster tape, generic subject title for stox tape, political event title for field tape, etc. This field is used for Amnets, Visnews, Stox tapes, Telecine packs and WTN items.
<i>Item/Segment ID (ID)</i>	This field is used only when the item/segment belongs to a show. It contains the unique identifier assigned by the library for the item/segment. It allows the linkage of all the items/segments of a show. Format is 0 [channel code] - 000000 [broadcast date] - 0000 [broadcast time HH:MM] / 00 [number assigned sequentially to each item by library staff]. Eg., 1-990325-2000/01.

<i>Original/Repeat Indicator (ORI)</i>	This field is used only when item/segment belongs to a show. It contains the code "O" or "R" indicating whether the item/segment is an original or a repeat.
<i>Original Item/Segment ID (OID)</i>	This field is used only when the item/segment belongs to a show and is a repeat. It contains the ID of the original item/segment and allows the linkage of the item/segment repeats with the original.
<i>Record Status (RS)</i>	Contains information regarding the status of the record, the input location, and the input person's name at different stages of record creation. Multiple subfields are separated by a semicolon and a space.
<i>Record Date of Birth (DOB)</i>	Contains the date on which the database record was created. The system assigns this number to a database record when it first appears queue file; the field should not be filled in by the cataloguer.
<i>Date of Last Update (UP)</i>	Contains the date on which the record was last changed. The system assigns and updates this number when a record appears in the queue file; the field should not be filled in by the cataloguer.
<i>Item/Segment Title (TI)</i>	For daily network news, stox tape, and field tape, the TI field contains the item title or slug. For news specials, Current Affairs and host broadcaster tape, the field contains the segment title. When a news special program or a host broadcaster tape contains only one segment, the segment title will be the same as the program title or the cumulation tape title respectively. Titles are not necessarily unique; the same title can be used for more than one item. Maximum character length is 100.
<i>Sub-title (ST)</i>	Contains the sub-title of the item or segment, if one exists. It is an additional title to help describe the item. Maximum character length is 100.
<i>Number (NUM)</i>	When IT=DNN, this field contains the number assigned to the story by the newsroom, generally called the NAT number. If no number exists, enter 0000.
<i>Voice-over Indicator (VOI)</i>	Contains a code "Y" if the item/segment is an announcer voice-over.
<i>Event Date (EVD)</i>	For news, when the news event occurred on a date different from the broadcast date or edit date, the date of the news event is entered in this field. For cumulation tape, when the shots in the item/segment are related to a specific event, eg. The First Ministers' Conference, the date of that event is entered in this field. Format is YYYYMMDD.
<i>Edit Date (EDD)</i>	For news, when the news event has not aired and the event date is not known, the edit date will be entered in this field. For cumulation tape, when the shots in the item/segment are not related to a specific event, the edit date is entered in this field. Format is YYYYMMDD.
<i>Dateline (DL)</i>	Contains one or more origins of the item/segment, not necessarily the place where it originates. Multiple datelines are separated by a semicolon and a space, e.g. HALIFAX; VANCOUVER.

<i>Synopsis (SYN)</i>	The synopsis should reflect the main thrust of the item, and should contain key words, locations, and topics. The SYN field should be completed only after the item/segment has been viewed in full. The news introduction is helpful in creating a concise overview or summary of the item content. Names are generally included in the People field and are not required in the synopsis. Exceptions to this are profiles of people, and people known by more than one name. Avoid words like "it" and "they" in the synopsis. The synopsis should be one to three sentences long, and is limited to 500 characters.
<i>Subject Headings (SH)</i>	Contains terms describing what the item/segment is about. The SH field is also used for geographical location of an item. Information must be entered in upper case letters, with multiple entries separated with a semicolon and a space. A maximum of ten entries is allowed in this field. The SH field is thesaurus-controlled. Check your printed or electronic thesaurus if you are not sure if a location or subject heading is included. If you enter a term that does not appear in the thesaurus, the record will not be accepted into the database. For more detailed guidelines on choosing subject headings, click here.
<i>People (PP)</i>	Contains the names of notable people - names that add precision to the description of the item and aid its retrieval. Information must be entered in upper case letters, with multiple entries separated with a semicolon and a space. A maximum of ten entries is allowed in this field. The PP field is thesaurus-controlled. Check your printed or electronic thesaurus for spelling, and to verify that the name can be included. If you enter a name that does not appear in the thesaurus, the record will not be accepted into the database. For guidelines on entering names in the PP field, click here.
<i>Organizations (ORG)</i>	This field is used when an item is related to specific organizations. Organizations mentioned more than three times will be added to this field. Information must be entered in upper case letters, with multiple entries separated with a semicolon and a space. A maximum of 10 organizations can be listed. The ORG field is thesaurus-controlled. Check your printed or electronic thesaurus if you are not sure if an organization is included. If you enter a term that does not appear in the thesaurus, the record will not be accepted into the database. For guidelines on entering organizations in this field, click here.
<i>Reporters (RP)</i>	Contains the names of reporters, whether National, Journal, Regional, or other. A maximum of 10 entries may be listed in this field. Enter RP headings in upper case characters; separate multiple entries with a semicolon and a space. This field is thesaurus-controlled. For guidelines on entering names in the RP field, click here.
<i>Producers (PD)</i>	Contains the names of producers. A maximum of 10 names may be listed in this field. Enter information in upper case characters; separate multiple entries with a semicolon and a space.
<i>Length (LEN)</i>	Contains the length of an item measured by time. The format is MM:SS.
<i>Footage (FT)</i>	Contains film footage of an item measured in feet. Used for older material only.
<i>Bureau/Location (BUR)</i>	Contains the prime bureau/location responsible for the item.

<i>Holdings Information (HI)</i>	Contains information related to the physical broadcast materials. The format for this field is: */holding medium (HIM) /holding number (HIN) /counter time of item (HIT) /holding location (HIL) /sound type (HIS) /tape remark /1-3 editorial sources (HIE) /restricted indicator. Click here for more details.
<i>Notes (NOTE)</i>	Contains general notes. It may contain full names of non-standard editorial sources when they exist. It is used to note legal restrictions and rulings from the CRTC and any copyright clearances required for the future use of the item. This field is used often for stox tapes.
<i>Shotlist (SL)</i>	The shotlist consists of a shot description, which describes what is happening in the shot; and the shot type, a technical description of the shot. Use both upper and lowercase letters. The format for the SL field is: */shot type/ counter time (if used), shot description, semicolon. An asterisk (" * ") begins all shots; a semi-colon (" ; ") ends all shots.
<i>Old Item/Segment Information (OI)</i>	Contains miscellaneous information stored in the SHOWS field of the old library systems running on PDP.

Note. Adapted from CBUT Vancouver's Field Descriptions and Content Restrictions Naming Conventions. Received via email from Colin Preston and used with permission.

Appendix C.

Topic Guide

Project: Structuring the Field(s)
Interview Subject: Colin Preston
Interview Topic: Metadata Workflow for Film
Date: Wednesday, February 20th, 2008

- Can you pronounce your name and then spell it out?
- What is your current job title?
- How long and in what capacity have you been working at the CBC?
- Can you describe or tell the story of the way that film was catalogued as it moved through the production chain from planning to shooting to editing to archiving during the time that film was used at CBUT in Vancouver?
- Can you describe the development of procedures for the archiving of footage used over the time that film was in use at CBUT?
- Can you describe how film would be labelled by camera people before they handed the footage off to the editing phase?
- When editors cut stories what information was available to guide the process?
- Can you describe the ways that people would use the archives for story development?
- Do you think it is possible that methods used to describe content as it moved through the production process might have changed the structure of the nightly news broadcasts?
- Can you give any specific examples of how this could be the case in terms of the way that data was collected about the footage as it moved through the production process?
- Do you think it is possible that methods used to describe content as it moved through the production process could lead to a systemic bias towards certain attitudes, beliefs, or ideologies?
- Can you give any specific examples of how this could be the case in terms of the way that data was collected about the footage as it moved through the production process?
- Is there anything else that you would like to add or find interesting or relevant?