



InterPARES 2 Project

International Research on Permanent Authentic Records in Electronic Systems

Overview

Case Study 09(3): Digital Moving Images – National Film Board of Canada

Peter Gagné, Université Laval

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The Creator Context / Activity

Creator: The National Film Board (NFB) of Canada

Creator type: Artistic focus / Public sphere (agency)

Juridical context: The NFB was established by an act of Parliament in 1939 to complement the activities of the Canadian Government Motion Picture Bureau. Specific legislation includes:

- 1950 National Film Act: revised the NFB's mandate to "produce and distribute and to promote the production and distribution of films designed to interpret Canada to Canadians and to other nations."
- Canadian copyright law: the product of employees becomes the property of the NFB. Presently, the increase in contracting-out of film and use of film from third party sources has led to complex rights management issues.

Activity: The overall activity of the NFB is to create or aid in all aspects of the creation of audio-visual productions through to the distribution and preservation of films and videos. The NFB's productions are generally either documentary films (about 5% of the total output), or auteur-driven animation.

The activity that is the focus of this case study is the production and distribution of animated films.

Nature of Partnership

Creation of animated films is usually by private animators working under contract to the NFB for a given project. This situation produces a partnership between the following individuals:

- The animator, who is responsible for carrying out the ideas that have been accepted by the Board.
- The technical supervisor, who is responsible for ensuring that all technical aspects of the creative process will work together.
- Post-production employees, who take the animator's output and turn it into the final product as envisioned by the animator.

- The producer, who is responsible for putting the animation through all the steps of production within budget and time limits. Producers also act as the intermediaries between individual directors and animators and the NFB's administrative bureaucracy.

The NFB also provides its films and videos through a variety of distribution channels, including cinema, television and the Internet, as well as videocassettes and DVDs available to the public for purchase by individuals and video rental agencies.

Bureaucratic/Organizational Structure

The NFB is a federal government cultural agency within the Canadian Heritage Department. It has a head office in Ottawa, Ontario, with operational headquarters in Montréal, Québec and various production centers located in major cities across Canada.

The Government Film Commissioner acts as the head of the NFB and is the chairperson of the eight-member Board of Trustees, along with the Executive Director of Telefilm Canada and six other members, appointed by the Governor in Council. The management structure consists of Branch Directors, Innovation and Technical Resources, Communications and Outreach Development, Administration, Distribution, Human Resources, Planning, Program Evaluation and Audit, Business Affairs and Legal Services. The NFB is funded with Canadian federal funding, with cost recovery in some areas.

An executive producer heads each production office, while independent directors make the NFB films. Animation is generally carried out at the NFB headquarters or regional studios using NFB equipment and supplies. Although the NFB contracts private animators to work on the creation of a film, all production administration and technical support is provided in-house.

Digital Entities Studied

1. Digital animation products. Film frames are stored as TIFF (two-dimensional) or TARGA (three-dimensional) files.
2. The "production file," which contains all documentary information pertaining to a production, including contracts, proposals, research materials and reports, e-mail, etc. There are both paper and digital elements, which are generally Word documents.
3. Synchrone, a distributed database system that brings together various databases into one "centralized knowledge-management system."

Documentary Practices Observed

For the animation creating activity, there is no information management system working across the entire organization. This is problematic, because necessary information is not always supplied to different parties quickly.

Record Creation and Maintenance

There are no standardized or written creation **procedures** for animation creation. "Because of the Board's *auteur* approach to film making, each film is unique in its creation and...the procedures adopted for one will not necessarily be applied to any others. [...] The individual director or animator makes decisions which that person feels will accomplish the artistic end in view, with

(on some occasions) little regard for the technological, preservation and other problems which those decisions may entail.” (FR 2)

Even when there are certain procedures in place for individual productions, they are not always followed. While a technical supervisor may assist individual animators in developing **naming conventions** “to identify the individual components of his animation...the animator may instead develop his own naming conventions.” (FR 8) Due to this lack of continuity and the lack of an organization-wide information system, “producers, technical supervisors, etc. working on a given project [may] know what is supposed to be done, but this information is not always quickly transferred to the animator, who may start work only to find that he has to rename his digital objects so that post-production can use them.” (FR 8)

The **creation process** is unevenly documented, if at all. Although the production file contains all documentary information relating to a production, it “generally is weighted to the beginning parts of the production (including investigative proposals, development proposals, research reports, preliminary budgets, marketing plans, etc.) and *little if anything is documented about the actual creation of the film* and the twists and turns that its creation may have taken. “Snapshots” of the actual production process (or capturing the activities of the animators and others at a given point in time) are not obligatory and there is no mechanism for capturing them *even though producers thought they could be useful.*” (FR 8, emphasis added)

When the creation process is documented, this documentation varies largely depending on the size of the project and is dependent upon the project’s technical supervisor. “Small projects may use informal or lightly documented methods; the supervisor of a large project involving many people may produce a flowchart and other documentation, indicating all stages of the project. It was stated that occasionally an animator’s project will encounter problems in post-production because of faulty, insufficient or poor documentation.” (FR 9)

The digital entities may be **changed** in the course of their creation and maintenance. Animators may change their work up to the moment when the final film is completed, although “changes by the animator in the course of the work are generally not documented, or are very scantily documented...” (FR 10)

“The way in which the technical components are **organized** or created is of small moment¹ to the final production.” (FR 6) If the digital entities are seen as being the artwork used to create a production, “the ultimate schema for organizing the digital entities is the animator’s input to post-production, which produces the final product. This schema may even consist of handwritten notes.” (FR 13)

There is, however, a sort of **persistent unique identifier**—not necessarily for each digital entity, but for each production. “All productions are given a production number, which applies to all matters dealing with a given production and which is referred to in all documentation concerning the production. This number follows the production from its inception to the point where it is archived in the vault. All references in all systems to this number will lead to that particular production.” (FR 7) It seems that unique identifiers are only used at the entity level if different

¹ This expression is unusual. It most likely should be “of little importance.” (PG)

versions of digital entities are created. Each must have a separate identification number in order to be able to retrieve them. These are stored on the server (not in the recordkeeping system) until after production and are only accessible to those working on the production.

The Information Technology section of the NFB is responsible for maintaining all servers on which the animation is **stored** during the course of creation and for the hardware and software to allow the digital objects to be retrieved. When the work is in progress, all files are stored on both the network server and a backup server.

With regards to the use of **metadata**, the NFB is introducing the use of MPEG-7 and MPEG-21 as standards for encoding content and rights about films. However, this implementation of standards is not being carried out for archival reasons. “These are being introduced to simplify commercialization.” (FR 15)

Recordkeeping and Preservation

The NFB staffs a formal **archives** to provide records management for headquarters and all regional offices. The archivists/records managers are not directly responsible for physical preservation of the digital records, but determine what records will be preserved through various retention schedules. A separate division within the NFB, Innovation and Technical Resources, is responsible for dealing with problems of digital **preservation**. The NFB maintains virtually all of its records back to its creation in 1939.

The NFB has various **preservation strategies**. Video materials are written to master negative (film) stock for preservation, when this is considered merited. This is because film has a 110-year history of successful preservation and because the NFB has sixty years of preservation experience with negative stock. In addition to its known life span, film can be inspected with the naked eye and can be copied at a later stage to new electronic forms. Digital image files are currently preserved on Betamax. Digital objects are also stored on digital linear tape and are encoded in the Cineon and AVI formats. The Cineon format acts like a digital version of film.

Synchrone serves as a **record-keeping system** and is available on the NFB’s intranet.² It is an integration of multiple databases created through in-house software developments. The component databases or modules include SEGDA (a digital rights management system), a financial and budget management program and a vault management system (access to master copies and production footage). Synchrone is built on an Oracle database engine and functions as “a centralized knowledge management system presenting all qualitative and quantitative information on an NFB production or co-production in one view.” (FR 5) Synchrone uses a register system that creates one file for each film.

In terms of **storage** or the capture of records, Synchrone contains entities arising from the creation of a film (and all supporting documentation), the products of marketing and distributing, the completed film itself and scanned files of documents such as photographs, music cue sheets, etc. Records included in Synchrone are both conventional analogue and digital, but many of the analogue records are digitized, so as to be available in the system. Film frames are stored both on the author’s personal computer and on the NFB’s network server until production is complete.

² The final report (p. 2) also refers to Synchrone as the intranet itself.

TIFF and TARGA files are stored on linear digital tape, while the production itself is stored as MPEG-encoded files. Authors may copy each day's work to a DVD as **backup**, although this is an individual decision. "While it is recognized that DVDs are a volatile medium, they are handy to use for a number of short-term purposes." (FR 7)

As referred to above, one means of dealing with the issue of technological **obsolescence** is the writing of video materials to master negative (film) stock. If future need requires, film can be copied to new digital formats. Productions that are not transferred to film because of expense are given a "digital master" on digital Betacam. Also, for animation created for Web-based purposes, contractors are asked to provide the source code for an entity so that it will be possible to recompile and use the files when software changes occur. However, "it was observed that generally hardware changes much more rapidly than software, in the sense that formats such as TIFF have been available for many years and are compatible with current hardware and operating systems." (FR 9)

Accuracy, Authenticity and Reliability

The NFB "has a separate division devoted to innovation and technical resources, which deals with some of the problems of preserving the continuity, accuracy and authenticity of film, video and digitally-encoded products through time and across migrations." (FR 2)

Accuracy

"Authenticity is...bound up with accuracy, and accuracy can be relative." (FR 9)

Authenticity

The final report notes that "'Authenticity' carries varied meanings." (FR 9) The predominant meaning that the creator adheres to seems to be the notion of having a given production appear properly on the screen in the form in which it was meant to appear. The example given is a high-definition production that will be the industry standard in 5-10 years (thus ensuring its proper presentation in the future) but which will not render correctly at present and a standard-definition production, which will render correctly at the present time, though its longevity is doubtful.

"The final product is seen as the authentic, completed work. Authenticity and accuracy of representation are seen as two sides of the same coin, because authenticity is not seen as inherent in the individual digital object, but exists only in the final product." (FR 10)

If the final (digital) product is written to film to be used as the basis for future products, "This film is considered to be the authentic document." (FR 9) However, some interviewees considered that re-purposing a film, such as changing its format from film to video for television broadcast or videocassette production, caused significant losses, which altered or destroyed the authenticity of the original production.

Reliability

"This final product is written out to film or to Betamax as a means of storage, and this is seen as the basic means of assuring the continued existence of the animator's work in the form he approved." (FR 10)