# InterPARES 3 Project

**International Research on Permanent Authentic Records in Electronic Systems**

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| | Case Study Report |

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## Document Control

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## **Table of Contents**

# Case Study Report

## A. Overview

The City of Vancouver Archives (CVAN) is an administrative unit within the civic government of the City of Vancouver, Canada. Its mandate is to acquire and preserve the records of the City government and its various boards and agencies, and to acquire and preserve private records that document the City's history.

In the fall of 2007, the City procured an electronic records and document management system (ERDMS), intended for deployment to all City desktops. An initial InterPARES 3 case study was proposed that intended to look at configuration options for the procured software (HP TRIM[1]) and make configuration recommendations based on findings from InterPARES 1 and 2. Difficulties coordinating with the ERDMS deployment team prevented this research from being conducted. The research focus was subsequently shifted to an examination of CVAN's digital preservation environment.

In November 2008, CVAN began work on the Digital Archives Project, the goal of which was to develop a prototype OAIS[2] compliant digital preservation environment and an accompanying policy and procedural framework that would enable the Archives to preserve authentic and reliable digital records created by the City of Vancouver, its boards and agencies, as well as records acquired from private donors. This project was envisioned as the first step towards developing a sustained digital preservation program at CVAN.

A component of the overall project methodology[3] was to develop functional requirements for the preservation system from existing standards, beginning first with the OAIS reference model. The initial requirements analysis activity involved translating the reference model description present in the OAIS reference model into use case scenarios. The goal of the use case scenarios was to create plain language descriptions of all activities that must occur within the Digital Archives for use by system developers and archivists to design system architecture, evaluate and select system components, and integrate selected components within the system

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[1] Total Records and Information Management. Now known as HP Records Manager. See: http://www8.hp.com/us/en/software-solutions/software.html?compURI=1173707.
[2] Open Archival Information System (OAIS) Reference Model - ISO 14721:2003. See: http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=24683, and http://public.ccsds.org/publications/archive/650x0b1s.pdf.
[3] A complete project methodology can be found at: https://wiki.artefactual.com/wiki/Vancouver_Digital_Archives.

architecture. This analysis was used to develop the Archivematica software package for digital preservation.[4] Subsequent iterations of the requirements analysis task examined other standards and best practices documentation within the context of the Digital Archives Project and OAIS framework to incorporate relevant components into the Digital Archives use case scenarios and/or more detailed requirement specifications. Although the whole of the OAIS model was subject to this analysis, the focus of the initial work was to develop a workflow that encompassed the Ingest portion of the OAIS functional model, and to package appropriate tools into a workflow that enabled CVAN to receive records from a creator and render them into a state where the records are considered preservable.

The initial analysis of the OAIS reference model resulted in the creation of a set of UML[5] activity diagrams.[6] These activity diagrams were then reviewed against the InterPARES 2 Chain of Preservation (COP) model,[7] the primary goals being to determine if the activity modeling was consistent with the relevant portions of the COP model, and if not, to identify gaps. Analysis revealed gaps in the ingest function related to appraisal. Consequently, the relevant functional requirements derived from the COP model were incorporated into the second iteration of the requirements analysis activity, by identifying relevant InterPARES findings,[8] translating them into use case scenarios and/or requirement specifications, and attaching them to the requirements framework produced by the first iteration of OAIS analysis.

Subsequent to the analysis of the UML activity diagrams, there was also discussion about the suitability of the metadata elements being captured during the generation of the Archival Information Package (AIP). Action Item 46 from TEAM Canada Plenary Workshop #5, held in November 2009, proposed a study to map COP metadata to the PREMIS (Preservation Metadata: Implementation Strategies) metadata dictionary.[9] This was initially proposed as a continuation of CS16, but was instead incorporated into the broader InterPARES 3 general study, *GS15 - Application Profile for Authenticity Metadata*.[10]

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[4] See: https://www.archivematica.org/wiki/Main_Page.
[5] Unified Modeling Language. See: http://www.uml.org/.
[6] See: https://wiki.artefactual.com/wiki/Requirements_Analysis#City_of_Vancouver_Archives_.28UML.29_Activity_Diagrams.
[7] See: http://www.interpares.org/ip2/display_file.cfm?doc=ip2_book_part_5_modeling_task_force.pdf.
[8] Presently, the COP model developed by InterPARES 2 has been identified as being the primary documentation for this activity. See part five of: Luciana Duranti and Randy Preston, eds., *International Research on Permanent Authentic Records in Electronic Systems (InterPARES) 2: Experiential, Interactive and Dynamic Records* (Padova, Italy: Associazione Nazionale Archivistica Italiana, 2008), electronic version, http://www.interpares.org/display_file.cfm?doc=ip2_book_complete.pdf.
[9] See: http://www.loc.gov/standards/premis/.
[10] See: http://www.interpares.org/ip3/display_file.cfm?doc=ip3_canada_gs15_final_report.pdf.

## B. Statement of Methodology

CVAN worked with Artefactual systems to create functional requirements for a digital preservation system. This was an iterative process that began by examining the high level functional model provided in the OAIS reference model[11] and translating elements from the OAIS into functional requirements at progressively lower levels through each iteration. Additionally, subsequent iterations also incorporated requirements outside of the OAIS in the form of other standards documents or CVAN-specific contextual requirements.

Each iteration produced a set of UML activity models intended to: (a) identify required actions to evaluate and select software capable of performing those actions, (b) identify gaps where no current software product existed, and (c) identify interfaces where output of one product would be used for input of another product.

The first three iterations were: OAIS alone; OAIS in CVAN context; OAIS looking at records maintained in and transferred from VanDocs (the City of Vancouver ERDMS), with the focus being on the ingest function within the OAIS. The InterPARES 2 COP model was then applied to the final iteration to identify COP components that were not represented in the existing UML activity models. Analysis of the COP was limited to Node A4 – Manage Records in a Permanent Preservation System. Identified gaps between the COP and the Archivematica UML models were incorporated into the most recent version of the UML models.

## C. Description of Context

The initial contextual analysis of the City of Vancouver was performed on the assumption that the initial case study proposal to make configuration recommendations from HP TRIM would proceed. A second contextual analysis was not performed when the research focus became the analysis of the UML activity modeling for Archivematica against the COP IDEF0 functional model. The results of the initial contextual analysis are presented below. Particularly noteworthy is that the technological context of the digital archives is not included in this analysis. At the time of study, the digital archives' technological environment was still developing. The rapid development methodology used for the Archviematica development meant that the technological context was constantly changing in reaction to the incremental iterative development characteristic of this methodology. Therefore, the description of context is not

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[11] See: OAIS Reference Model - ISO 14721:2003, Section 4.

reflective of the systems used to preserve and provide access to records, only of the systems used to create and maintain records.

### *Provenancial*

The City of Vancouver Archives is an administrative unit within the civic government of the City of Vancouver, Canada, and is part of the City Manager's Office – City Clerk's Department – Records and Archives Division

The City of Vancouver Archives is located in Vanier Park, at 1150 Chestnut Street in Vancouver, British Columbia, Canada. The Records and Information Management section of the Records and Archives Division, relevant to this project because of their involvement with the implementation of VanDocs (TRIM EDRMS) and VanRIMS classification system and retention schedule, is located at City Square at 555 West 12th Avenue, Office 585, East Tower, in Vancouver, British Columbia, Canada.
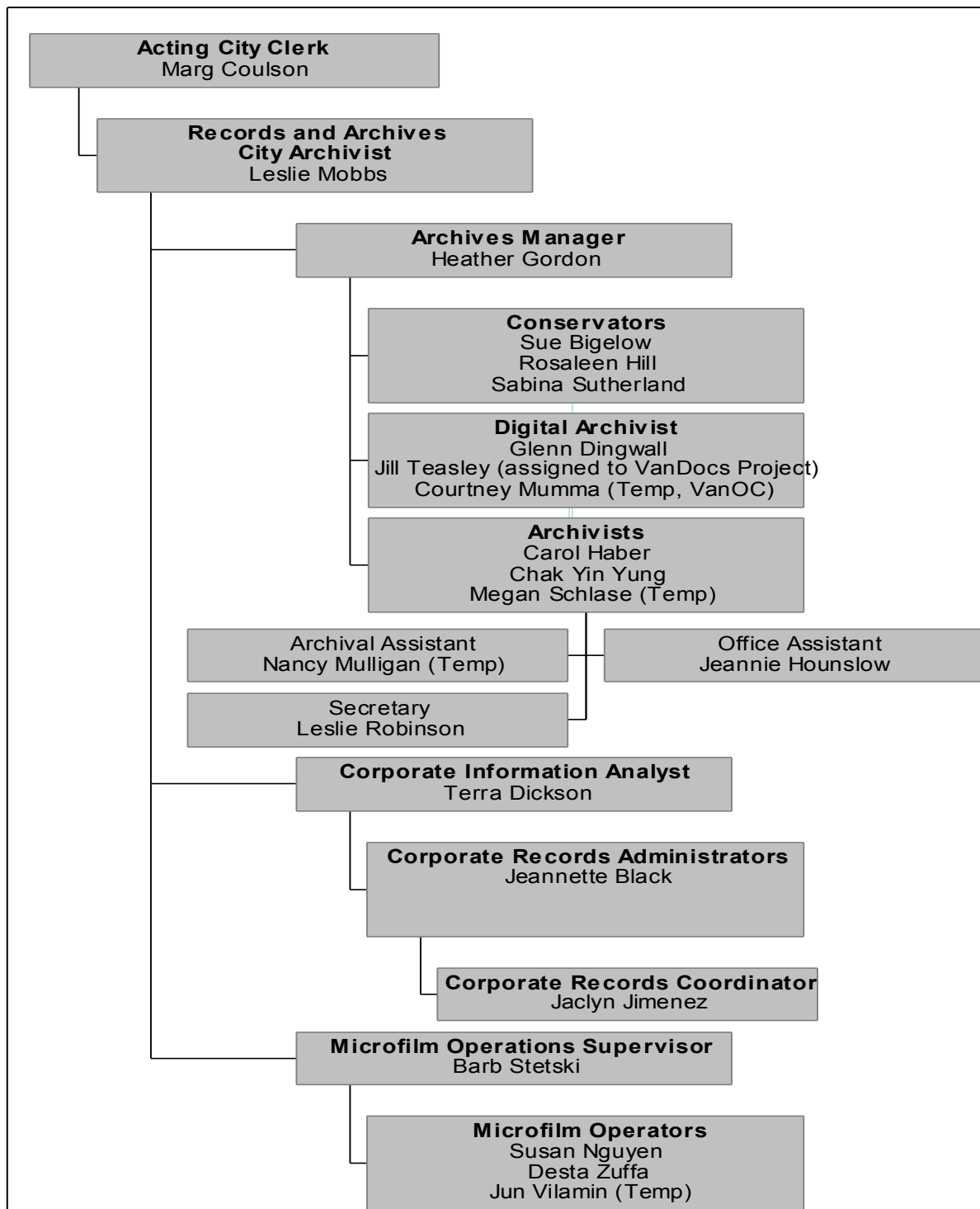
The City of Vancouver Archives is a Governmental organization with a municipal mandate. The Archives' mandate is: (a) to acquire, accession and preserve historical public records, private papers, photographs, and other items relating to the City of Vancouver and its various boards and agencies; (b) to arrange and describe these items and make them available to the public and the City for research and administrative purposes; (c) to conserve deteriorated documents, maps, photographs, works of art, and other materials; and (d) to deliver public programs including publications, exhibitions, and events.

The Records and Information Management section's mandate is to promote knowledge of information management throughout the City organization, to encourage the use of information as a valuable corporate resource and to provide records management services to the organization.

The City Clerk oversees the management of records and is ultimately responsible for the management and administration of the Corporate Records and Information Management Policy. The City Clerk may establish requirements, procedures, standards, and guidelines necessary to the application of this policy. There are three distinct business units within the Records and Archives Division: the City of Vancouver Archives, Records and Information Management, and Micrographics. For the purposes of this case study, the focus is on the Archives and Records and Information Management sections.

Leslie Mobbs is City Archivist and Director, Records and Archives Division of the City Clerk's office. The Digital Archives Team consists of Archives Manager, Heather Gordon,

Digital Conservator, Sue Bigelow, and Digital Archivist, Glenn Dingwall. See Figure 1 for the Records and Archives Division's section of the City Clerk Organization Chart. Megan Schlase, currently an Archival Assistant, will replace Jill Teasley as Archivist until 2012.

**Acting City Clerk**
Marg Coulson

**Records and Archives City Archivist**
Leslie Mobbs

**Archives Manager**
Heather Gordon

**Conservators**
Sue Bigelow
Rosaleen Hill
Sabina Sutherland

**Digital Archivist**
Glenn Dingwall
Jill Teasley (assigned to VanDocs Project)
Courtney Mumma (Temp, VanOC)

**Archivists**
Carol Haber
Chak Yin Yung
Megan Schlase (Temp)

Archival Assistant
Nancy Mulligan (Temp)

Office Assistant
Jeannie Hounslow

Secretary
Leslie Robinson

**Corporate Information Analyst**
Terra Dickson

**Corporate Records Administrators**
Jeannette Black

**Corporate Records Coordinator**
Jaclyn Jimenez

**Microfilm Operations Supervisor**
Barb Stetski

**Microfilm Operators**
Susan Nguyen
Desta Zuffa
Jun Vilamin (Temp)

**Figure 1.** Records and Archives Division of the City Clerk Organization Chart

IT support is provided by Corporate IT's help desk, webmaster, and dedicated analysts for specific business applications. There is also a VanDocs (TRIM) project team in the Records and Information Management division that is dedicated to helping with VanDocs questions.

### *Juridical-Administrative*

The City of Vancouver Archives is governed by provincial and organizational laws and by-laws. The Archives' authority to acquire and preserve the City's records is established by the Vancouver Charter [SBC 1953, c. 55, part IV], the City of Vancouver Records Management By-law 9067 (July 2005),[12] and the City of Vancouver Corporate Records and Information Management Policy Number AG-002-01 (July 2005).[13] Provincially, the records of the City of Vancouver are subject to the B.C. *Freedom of Information and Protection of Privacy Act* [RSBC 1996, c. 165].[14]

#### *Ethical requirements and constraints*

City of Vancouver Archivists adhere to professional codes of ethics that outline the standards of conduct for their profession. These standards are described in documents such as the International Council for Archives' *Code of Ethics* and the Association of Canadian Archivists' *Code of Ethics*.[15] Included within these documents are the archivists' responsibilities to their employing institutions, peers, to archival theory and practice, as well as to the records themselves. Conservators working within the Archives also follow a professional code of ethics created by the Canadian Association for Conservation of Cultural Property and the Canadian Association of Professional Conservators.[16]

### *Procedural and Documentary*

Digital records preserved by the Archives are generated through one of three mechanisms.

1. Born digital (public) records are created by City departments in the course of their business. The primary interest for the purpose of the case study is records maintained in VanDocs (HP/Tower TRIM ERDMS). The City of Vancouver generates records of

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[12] Available at: http://vancouver.ca/bylaws/9067c.pdf.
[13] Available at: http://vancouver.ca/policyprocedure_wa/index.cfm.
[14] Available at: http://www.oipcbc.org/legislation.htm.
[15] See: http://www.ica.org/5555/reference-documents/ica-code-of-ethics.html and http://archivists.ca/content/code-ethics.
[16] See: https://cdn.metricmarketing.ca/www.cac-accr.ca/files/pdf/ecode.pdf.

archival significance when carrying out the administration and operation of municipal functions. The general activities that generate records include:[17]

- Addressing and Street Naming
- Affordable Housing
- Archival functions
- Business Services
- By-laws
- Capital Budgets and Capital Plans
- Civic Boards and Commissions
- Classification and Compensation
- Collective Bargaining
- Communications
- Community and External Relations
- Construction Planning
- Corporate Accounting
- Corporate Management
- Council and Board
- Council and Committee Meetings
- Cultural Services
- Debt Management
- Developing Policies and Procedures
- Development and Fundraising
- Development Services
- Emergency Preparedness
- Emergency Response
- Employee and Labour Relations
- Environmental Protection
- Event Planning
- Facilities Development and Maintenance
- General Local Elections
- Heritage Planning
- Internal Auditing
- IT Business
- Legal Services and Agreements
- Local Improvement Management
- Mail and Courier Services
- Metro Vancouver Relations
- Olympics Organization
- Operating Budgets
- Planning
- Plant and Animal Management
- Programme Development
- Public Access and Involvement
- Public Library functions
- Public Works Management
- Records Management
- Reproduction Services
- Site Planning and Development
- Social Planning
- Staff and Committee Meetings
- Staffing and Recruitment
- Strategic and Organizational Planning
- Street Structures Management
- Surveying and Mapping Services
- Taxation and Utilities
- Transportation Planning
- Vehicle and Heavy Equipment Management

2. Digitized records are digital copies of analogue records in the Archives' holdings that have been digitized to facilitate access and/or preservation. These can included any private or public documents that have been deemed worthy of long-term preservation and scanned by Archives staff to facilitate public access.

3. Born digital (private) records are digital records created by private third-parties that have been acquired by the Archives for long-term preservation in accordance with its "total archives" mandate.

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[17] Source: VanRIMS Secondaries with Archival Disposition, 2009.

*Documents resulting from activities*

Born digital (public)[18]

Born digital public documents include:

- Advertisements
- Agendas
- Agreements
- Applications
- Blueprints and building plans
- Budgets
- Certificates
- Contracts
- Copies of grant applications
- Correspondence and e-mail
- Databases
- Diagrams
- Discussion papers
- Drawings
- Educational materials
- Estimates
- Fact sheets
- Financial records

- Forms
- Invitations
- Invoices
- Itineraries
- Legal agreements
- Lists
- Logs and/or registers
- Manuals
- Maps
- Membership lists
- Membership lists

- Memos
- Minutes
- Multi-media recordings
- Negotiations
- News articles
- Newsletters
- Notes
- Photographic material
- Policies
- Presentations
- Procedures
- Profiles
- Proposals
- Protocols
- Purchase orders
- Reference materials
- Reports
- Requests for issuance of proclamations, draft proclamations, and copies of issued proclamations
- Requests for proposals
- Research
- Sample ballots
- Schedules
- Site plans
- Spreadsheets
- Statistical information
- Surveys
- Tender documents
- Testing and configuration data
- Work plans and project plans

Digitized

Digitized documents include:

- Motion pictures
- Photographs
- Maps

- Textual documents
- Sound recordings

Born digital (private)

The born digital records donated by, or acquired from, private sources are received in any variety of document types. Currently, the Vancouver Archives has no policies in place to manage

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[18] VanRIMS Secondaries with Archival Disposition, 2009

the acquisition of born digital private documents, although the need to create such a policy has been identified.

*Existence of a records management program*

Born digital (public)

The City of Vancouver has begun to utilize HP TRIM software in conjunction with the classification and retention standard Van RIMS to implement the VanDocs EDRMS project. The records management policy and its associated by-law are detailed in a City of Vancouver Policy Report from 2005.[19]

Currently, there are 190 city employees using VanDocs, although the number is expected to exceed 5000 by 2012. VanDocs is located on a designated virtual server. Although full access is the default setting for VanDocs, employees may be assigned differing security levels, which impacts their ability to create, read and/or modify the documents and folders within the EDRMS system. Each employee is responsible for filing his/her own documents and VanRIMS classification is mandatory.

Although the City Clerk oversees the corporate responsibility for records management, a Corporate Records Committee (CRC) works with departments to create records schedules and to ensure that legal requirements are met.[20] "The [CRC] consists of the City Clerk, the Director of Finance, the Director of Legal Services, the Corporate Records Administrator, and the City Archivist."[21] Within City departments, the person in charge must designate a department employee to act as a Departmental Records Coordinator (DRC). The DRC is usually a clerical staff member or a paralegal who must undergo training in VanRIMS. The DRC is responsible for preparing records schedules, managing records, designating the Office of Primary Responsibility for archival records, training staff in recordkeeping practices and liaising with the Corporate Records and Information Management Program. Within the Records and Information Management Program, there are two employees with full Administrator access.

Digitized

All material is placed on the Vancouver Archives' Q-drive and organized according to its digitized file format. The files are considered preservation masters and are therefore saved in

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[19] City of Vancouver, "Policy Report Information: Records Management By-law and Policy," City of Vancouver Corporate Records and Information Management Policy, June 2005. Available at:
http://former.vancouver.ca/ctyclerk/cclerk/20050712/documents/p2.pdf.
[20] Ibidem.
[21] Ibidem, p. 3.

specifically-determined file formats. All Archives staff members have reading privileges, a few staff members have write privileges, but only three staff members—Heather Gordon, Glenn Dingwall, and Sue Bigelow—have full read-write privilege for the Q-drive. Additionally, corporate IT has full administrative access to the Q-drive.

<u>Born digital (private)</u>

This material is accepted in the format in which it was created and saved in folders named according to year and accession number on the Q-drive. The documents are not currently migrated or saved in designated file formats.

*Individuals responsible for records maintenance*

<u>Born digital (public)</u>

Names and qualifications of RIM staff with Administrator access:

- Jeannette Black has worked at the City for 25 years and in records for 22 years. She has a library technician degree and has taken some CRM courses.
- Terra Dickson (MAS) has 5 years experience administering EDRM systems in the public and private sector.

Vancouver Archives Staff and Qualifications:

- Leslie Mobbs (BA) is the City Archivist and Director of the Records and Archives Division. He has over 35 years experience working in archives and records management at the municipal, provincial and federal levels of government.
- Heather Gordon (MAS) is the Archives Manager for the City of Vancouver Archives and is a member of the Digital Archives team.
- Sue Bigelow (MAC) is the Digital Conservator and is a member of the Digital Archives Team.
- Glenn Dingwall (MAS) is a Digital Archivist and is a member of the Digital Archives Team.
- Jill Teasley (MAS) is a Digital Archivist (on reassignment to the VanDocs project until 2012).
- Carol Haber (BA plus over 20 years experience at the Archives) and Chak Yung (MAS) are full-time archivists for the City Archives, and Megan Schlase (MAS) is currently a full-time archivist but her usual position is that of an archival assistant (replacing Digital Archivist Jill Teasley to 2012).
- In addition, the Archives employs one Archival Assistant and 2 clerical/ administrative staff.

<u>Digitized</u>

Archives staff (outlined above).

Born digital (private)

Archives staff (outlined above).

*Existence of maintenance strategies*

Born digital (public)

Records are kept within the VanDocs EDRMS in the format in which they were created. Although VanRIMS contains records retention and destruction schedules, no records are currently disposed of under these retention schedules as they have not been granted final disposition approval by the City lawyers. Records are being destroyed or transferred to Archives, but only under the old schedules and only if the retention periods agree or the old periods are longer than those listed in the new schedules. Legacy documents are being migrated into VanDocs, classified, and are assumed to be authentic.

It is the intention of the Records and Information Management Program to transfer records with long-term and archival value to the City of Vancouver Archives once a digital archives has been designed and implemented and retention schedules have been approved. The City of Vancouver Archives is currently working with Peter van Garderen of Artefactual Systems and the InterPARES 3 Project to establish a trusted digital repository.

Digitized

Digitized material is saved on the Q-drive as the digital master in a designated file format. Copies are made and utilized for public access purposes. These copies are saved in another drive and are often saved in a lower quality file format such as a JPG.
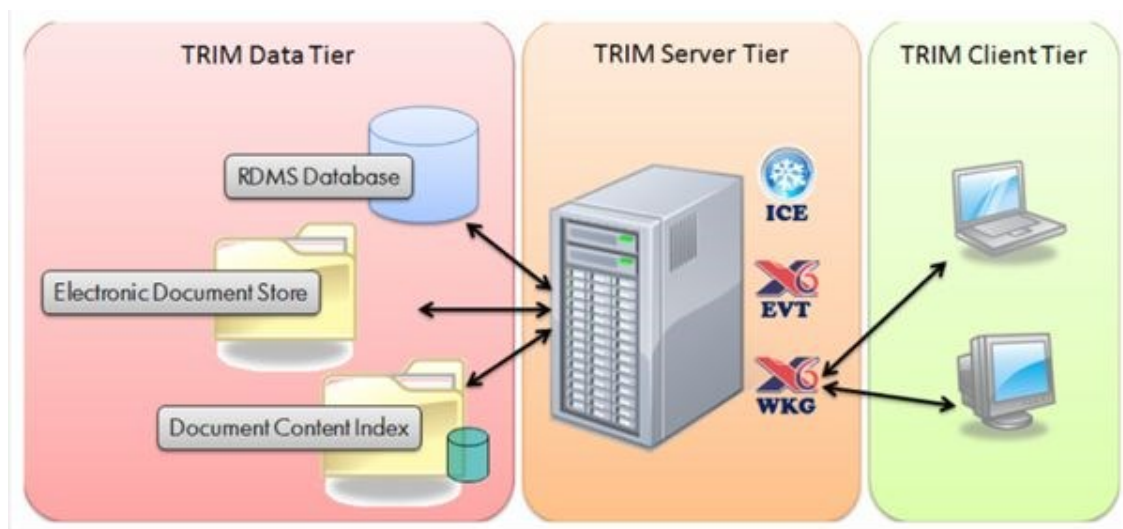
Born digital (Private)

These records are maintained in the Q-drive in the format in which they were created.

### ***Technological***

Born digital (public)

1. Architecture:

   [see figure on next page]

2. Creation, input, and processing tools: TRIM, Microsoft Office Suite, Various audio and photographic input tools.

3. Types of documentary presentations created: graphic, textual, structured data, and audio-visual.

4. Formats created:

| | | | | | |
|---|---|---|---|---|---|
| AVI | GIF | MDB | PPTX | VMBX[22] | XLSX |
| BMP | HTM | MPP | RPT | VSD | XLT |
| DOC | HTML | MSG | RTF | WMV | ZIP |
| DOCM | INDD | PDF | TIF | WPD | |
| DOCX | JPG | PNG | TR5 | WVX | |
| DOT | JS | PPT | TXT | XLS | |

Digitized

1. Architecture: Epson 1640XLscanner, Epson V750M scanner, Nikon Coolscan 5000, Nikon D80 DSLR, and the following audio equipment:

- **Studer A807** – This is an open reel tape player. It is attached to wheels. It is connected to the MOTU at inputs 1 and 2. This player is an Archivist model and does not have a recording head.

- **Nakamichi Dragon** – This is a compact cassette tape player, one of the finest ever made. It is connected to the MOTU at inputs 3 and 4.

- **MOTU 828 Mark II Analogue/Digital** – This is a very good external sound card that is capable of digitizing up to 24 bits and 96 kHz. It is connected to the computer via FireWire, and uses an ASIO driver that allows it to act as the

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[22] NOTE: For the most part, when an e-mail is saved to TRIM, it is saved as VMBX. VMBX is proprietary to the TRIM software. The MSG format of the message is saved as a rendition of the VMBX document.

sound card for both digitizing and playback from within the WaveLab software.

2. Creation, input, and processing tools:

- **WaveLab 6** – This software package is used to create the master and derivative files and for some signal processing. This is the software used by the Sound Directions Project. The Archives uses version 6.1.

- **DC6** – This software is used for special signal processing for access files. It can remove noise that other software cannot. It is suitable for major problems.

- **MOTU CueMix Console** – This software controls the gain and outputs for the MOTU.

3. Types of documentary presentations created: graphic and audio-visual.

4. Formats created: There are 626 gigabytes of digitized material on the Q-drive in the following formats:

| MPEG2 | WAV | MRK | TIFF | JPK |
|-------|-----|-----|------|-----|

Born digital (private)

1. Architecture, creation, input, and processing tools: This material is maintained in the format in which it was received. As there are currently no written policies guiding donations of born digital records from private persons, the technological requirements could vary significantly between acquisitions.

2. Types of documentary presentations created: graphic, textual, and audio-visual.

3. Formats created: There are 316 megabytes of born digital (private) documents on the Archives' Q-drive. The material is not currently migrated into standardized formats and, as they are maintained in the original structure, may be in any variety of formats.

These specifications assume a legal and bureaucratic structure that might not be appropriate to all InterPARES 3 case studies. However, each of these contexts should be addressed at least to the extent that their inapplicability is documented, and the environment in which digital entities are created and managed, or the framework of action in which they participate, is described.

Technology/tools evaluation

The following are technologies and tools currently under consideration by the Vancouver Archives and Artefactual Systems for use in the trusted digital repository:

- Ingest
  - NLNZ Metadata Extractor
  - JHOVE
  - DROID/PRONOM (TNA)
  - Jacksum
  - md5sum
  - XENA (NAA)
- (Meta)Data Management
  - XMLStarlet
  - ICA-AtoM
- Archival Storage
  - AMANDA
  - iRODS
  - Sun ZFS
  - CEPH
  - PVFS
  - (VAN) SAN/NAS
- Access
  - ICA-AtoM
- Preservation Planning
- Administration
  - Requirements Management : Mediawiki
  - Documentation: MediaWiki
  - Version Control: Subversion[23]
- Evaluations
  - DROID, JHOVE, NLNZ Metadata Extractor
- Archival Storage requirements: iRODS vs ZFS vs CEPH vs PVFS
  - iRODS[24]

## D. Narrative Answers to the Recordkeeping Systems Questions for Researchers

The following questions are answered with regard to public records created by the City of Vancouver and its respective Boards and Agencies. The Archives also acquires records of private bodies. The procedures, systems and technologies used by private creators are diverse, and the management of them is outside of the Archives' mandate. Records received from private donors are preserved using the same systems and technology as public records. The primary difference between the two types of creators relates to acquisition, appraisal and access policies. Acquisition and appraisal of public records is governed by VanRIMS; acquisition and appraisal of private records is governed by the Archives' relevant acquisition and appraisal policies.

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[23] Available at https://wiki.artefactual.com/wiki/Technology/Tools_Evaluation (Last accessed 6 June 2014).
[24] Ibid.

Access to public records is governed by the *BC Freedom of information and Protection of Privacy Act*; access to private records is governed chiefly by the terms of the respective donation agreements, and to the Archives' applicable access policies.

1. *Does the creating body have a recordkeeping system in place for its traditional records? If yes, what are its components (e.g., classification system, retention and disposition schedule)? If not, does it have specific control instruments, such as indexes?*

    All records at the City of Vancouver are subject to VanRIMS (Vancouver Records and Information Management Standard), an integrated, function-based, classification scheme and retention and disposition schedule. VanRIMS is also used to classify digital records in VanDocs, the City's ERDMS. At the time of this case study, a staged roll-out of VanDocs was taking place in City departments, but had not been fully implemented City-wide. Records created and in semi-active status prior to the implementation of VanRIM in 2005 are being transferred to the Archives under pre-existing legacy schedules.

2. *Does the creating body want to establish an integrated and centralized digital recordkeeping system, controlling all records of the organization in all media and form? If yes, what are the separate records creating units that would share the system? If not, does the creator want separate records systems for digital and traditional records, or does it want separate recordkeeping systems for each unit?*

    The City's intent is that, to the greatest extent possible, digital records should be managed in VanDocs. There is recognition that some forms of digital records are not suitable for management in an ERDMS. Records in these systems are subject to VanRIMS, and are managed on a case-by-case basis according to their specific technological contexts.

3. *What are the system(s) within which the records are presently created (e.g., functionality, software, hardware, peripherals etc.)?*

    The VanDocs ERDMS software is HP/Towersoft TRIM. The primary record-making tool for most staff is the Microsoft Office suite. VanDocs is integrated into the save/open menus for Word, Excel, PowerPoint and Outlook. An exhaustive list of the creating applications used by City staff does not exist. Additionally, VanDocs includes records received from external parties, for which the creating applications may not be known.

*4. From what applications would the recordkeeping system(s) inherit or capture the digital records and the related metadata (e.g., e-mail, tracking systems, workflow systems, office systems, databases, etc.)?*

As mentioned above, records are created in a variety of applications. Recordkeeping metadata are generated when a record is saved into the recordkeeping system. Some VanDocs metadata are system-generated; in particular: date of creation, date of registration, registration number, registering account ID. Other recordkeeping metadata are added by the user; mandatory metadata elements are limited to document title, classification code, and author.[25] Other metadata are either optional, or calculated from a combination of system-generated and user-input metadata (e.g., disposition date is calculated from the date of creation based on the retention schedule associated with the user input classification code).

*5. Are the digital records that will be captured in the recordkeeping system already organized in a way that reflects the creation processes? What is the framework (e.g., functional classification), if any, for organizing them?*

Records created by City of Vancouver employees, boards and agencies are classified according to the VanRIMS functional classification scheme, which identifies fifteen function groups representing the highest level of classification in VanRIMS, where established. They are as follows:

- 01 Administration
- 02 Facilities and Real Estate Management
- 03 Procurement and Inventory Management
- 04 Information Management
- 05 Financial Management
- 06 Legal Affairs and Risk Management
- 07 Human Resources Management
- 08 Governance
- 09-10 Reserved
- 11 Land Administration and Planning
- 12 Parks and Recreation
- 13 Engineering and Public Works
- 14 Fire and Rescue
- 15 Police

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[25] The use of the term "author" in VanDocs is similar but not equivalent to the archival diplomatic concept of "writer." See: http://www.interpares.org/ip2/ip2_terminology_db.cfm.

Each function group is divided into numerous primaries, the level of classification that corresponds to sub-functions. Primaries are further divided into secondaries, which are the lowest level of classification and correspond to activities and/or transactions. Disposition schedules are assigned at his level.

6. *Who needs to have access to the records controlled by the recordkeeping system and their metadata?*

City of Vancouver records are intended for use primarily by City employees. VanDocs, once fully implemented, will allow City employees access to the City records of all departments, although creators can apply a variety of security settings to their records so as to limit access. Also, employees may be assigned differing security levels that affect their ability to create, read and/or modify records and folders managed by VanDocs.

Each City department must designate a Departmental Records Coordinator (DRC) to be responsible for preparing records schedules, managing the records, designating the Office of Primary Responsibility (OPR) for record groups, training staff in accepted recordkeeping practices and communicating with the Corporate Records and Information Management (RIM) Program. Two Administrators from RIM coordinate the entire VanDocs system and have full access privileges to all records.

Limited City records are also available to the public. The Information Services of the City Clerk's Department is responsible for publishing and distributing City by-laws, policies and procedures, and schedules of City Council and committee meetings. City records are also made available to the public through FOI requests.

7. *Has the creating body, with or without the archives, already defined the intellectual and technological components and/or functional requirements for the recordkeeping system? If yes, what are they? If not, what are the fundamental requirements and the necessary components that would have to be implemented in such a system?*

The Corporate Records and Information Management Policy No. AG-002-01, published in 2005, established "the authority and responsibilities necessary for the management and control of the records of the City of Vancouver. . . ."[26] This policy applies to all City bodies and records and establishes that the Corporate Records Committee, under the authority of the City Clerk, is

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[26] City of Vancouver, "Corporate Records and Information Management Policy No. AG-002-01," 2005, http://vancouver.ca/policy_pdf/AG00201.pdf (Last accessed 6 June 2014).

responsible for approving record schedules. The policy further establishes that VanRIMS must be used by all City bodies and applied to all City records, regardless of record media. VanDocs adheres to this as well as to other City policies and procedures.

According to the City of Vancouver Records Management By-law No. 9067, enacted in 2005, each City body must prepare record schedules and submit them to the Corporate Records Committee for approval, manage its records according to the established schedules and comply with the records requirements determined by the City Clerk.[27]

At a meeting held in December 2008, the VanDocs team, the Digital Archives project team and the ERDMS vendor discussed transfer and metadata requirements as well as the core functionality of the TRIM software. As a result of this meeting, 23 mandatory requirements for the transfer of City of Vancouver records from VanDocs to the future City Digital Archives were developed. In addition, 29 metadata requirements, based on the U.S. Department of Defense (DoD) 5015.02 standard,[28] were established.[29]

Technological components of VanDocs include versioning control, audit trails and security settings.

8. *What descriptive or other metadata schema or standards are currently being used in the creation, maintenance, use of the digital records?*

VanDocs uses the default metadata schema present in TRIM. A copy of the schema and data dictionary was not available at the time of this report. The core elements visible in the document profile when a record is saved into the system are:

- Record number
- Title
- Container
- Author
- Revision number

- Related records
- Date created
- Enclosed?
- Edit status
- Access control

- Addressee
- Date registered
- Creator
- Audit events
- Document details

9. *What are the financial resources and technical capabilities of the creating body?*

The City of Vancouver is a large municipal government with an annual operating budget of approximately $1 billion, with a dedicated in-house information technology department. The

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[27] City of Vancouver, "Records Management By-law No. 9067," http://former.vancouver.ca/blStorage/9067.PDF (Last accessed 6 June 2014).

[28] United States, Department of Defense, "Electronic Records Management Software Applications Design Criteria Standard," DoD 5015.02-STD, April 25, 2007. Available at: http://www.dtic.mil/whs/directives/corres/pdf/501502std.pdf.

[29] Artefactual Systems, Vancouver Digital Archives, "VanDocs Interface," https://wiki.artefactual.com/wiki/VanDocs_Interface (Last accessed 6 June 2014).

Archives has an annual budget of approximately $1 million, and receives additional funding from grants.

The Archives has 25 desktop PC workstations, 2 terabytes of network storage dedicated for digital preservation purposes, and specialized image and audio digitization tools. The Archives receives technical support from the City's Information Technology department.

*10. What are the issues specific to the records of this creating body in relation to accessibility, security, data privacy, and FOIA?*

The City of Vancouver is a public body under the BC Freedom of Information and Protection of Privacy Act. Public records in the custody of the Archives are subject to the Act; records from private donors are subject to the Act.

Internal access to records in VanDocs can be restricted for business reasons based on the security settings applied to individual records, or inherited by records from their parent classification. City employees can apply one of four security settings to the records they create:

- Everyone (the record is accessible to all City employees)
- Container (the record inherits the access control properties of the folder to which it belongs)
- Private (the record is accessible to the creator only)
- Custom (the creator can specify the persons, positions, or groups to whom an individual record is accessible)

*11. With respect to the recordkeeping system represented in the InterPARES 2 Chain of Preservation model, what level of complexity is needed by the creating body?*

The Archives' goal is to develop detailed functional requirements for software development associated with the Ingest function of the OAIS model. This is best accomplished by looking at the most detailed level of complexity in the COP model. However, as it is concerned only with records that have been transferred into its custody from the City's recordkeeping system, or from the recordkeeping systems of private bodies, the full breadth of the COP model is not required; analysis may be limited to node *A4 - Manage Records in a Permanent Preservation System*, and the children of that node.

### E.  Narrative Answers to the Applicable Project Research Questions

*How can we adapt the existing knowledge about digital records preservation to the needs and circumstances of small and medium sized archival organizations or programs?*

Archivematica is an open source compilation of digital preservation tools developed and maintained by a diverse body of organizations, increasingly used by organizations of all size, but of particular importance to small- and medium-sized organizations because of the reduced cost of ownership enabled by the open-source, collaborative nature of the product. Subsequent iterations of the Archivematica package are improved by refining existing tools, creating new tools, better articulating existing functional requirements that determine how these tools interact with the overall workflow, and formulating new requirements based on changes in the digital recordkeeping and preservation environment.

In the context of InterPARES and Archivematica, the existing research benefits small- and medium-sized archives through its inclusion in the formulation and refinement of the functional requirements. The business model used to establish requirements for Archivematica is one in which an organization identifies a requirement that is not being met by the software, and that is of particular importance to that organization, and then contracts with the software developer to incorporate the requirement and associated functionality into the standard Archviematica package. Because of the open source nature of the product, this new functionality then becomes freely available to all users of the product. If the way that new requirements are introduced to Archivematica is at the request of archives themselves, it is important for archives to be aware of the current body of digital preservation knowledge, and to communicate new knowledge to archival organizations as it is developed.

*Can the action plan chosen for a given body of records be valid for another body of records of the same type, produced and preserved by the same kind of organization, person, or community, or be valid independently of the creating or preserving organization and its context?*

Yes – the goal of the Archivematica project is to make digital preservation software that covers a wide range of cases in terms of types of records it can ingest, and available archival resources. Though it is capable of being integrated with existing systems, it is intended, in its

simplest form, to exist architecturally independent from other systems that an archives may employ. Consequently, Archivematica is largely agnostic in terms of the specific systems used to create records, as long as the system is capable of meeting baseline requirements for creating records capable of being preserved.

The applicability of action plans for similar bodies of records is generally independent of the preserving body's juridical context. Insofar as they concern the receipt and ingest of digital records into a preservation environment, action plans for these activities developed by CVAN can and have been extended to most, though not all, other archival organizations in Canada and in other countries and cultures.[30] Overall, development has been undertaken with regard to the most general cases. Users can determine what archival activities to incorporate into their specific workflows. For example, the inclusion of appraisal activities into the general Archivematica workflow, as recommended by this study, does not force users to perform those activities at that point. If significant and sufficient appraisal has occurred before submitting records to Archivematica for preservation, these steps can be edited out of the workflow.

Users of Archviematica are obviously constrained by the capabilities of the software package. Action plans may be invalid for organizations with preservation requirements that fall outside of Archivematica's current capabilities. Although the development model does allow for new these requirements to be introduced into the Archivematica package, in some cases there may be significant or insurmountable obstacles to this. This is chiefly due to the open source nature of the product, which makes it problematic to include proprietary software products in the Archivematica package. For example, format migration/normalization of word-processing documents from MS Word formats that preceded Open Office XML[31] is best accomplished by MS Word itself. However, the proprietary nature of this product prevents it from being included in Archivematica distributions; archives that wish to use this migration path are required to go outside of the Archivematica workflow, denying the functionality to other organizations that might find it desirable.

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[30] For example, the file format normalization policies developed for CVAN became the default policies with which Archviematica is distributed.

[31] Office Open is Microsoft's XML-based file format (.docx) for word processing documents, not to be confused with OpenDocument (.odf), often called Open Office because of its association with the Sun (now Oracle) OpenOffice suite.

## F. Activity Modeling

No IDEF0[32] modeling was undertaken for this case study. However, the City of Vancouver Archives and Artefactual Systems developed UML models for the functional components of the OAIS. These are available at: https://wiki.artefactual.com/wiki/Requirements_Analysis.

## G. Conclusions

The core conclusions of this case study relate to Action Item 07 from the May 2009 TEAM Canada Plenary Workshop #04:

> G. Dingwall, with assistance from E. McLellan and the Research Assistants assigned to case study 16, to go through the Chain of Preservation (COP) model and either match that directly against the City's use case UML activity models that were created from the OAIS model, or translate the COP model activities and put them into the specific context of the City of Vancouver and then compare that customized version of the COP model to the City's use case UML activity models and identify where there are functional and/or metadata gaps or inconsistencies.[33]

The outcome of the above was that the analysis revealed gaps in the existing UML activity models related to appraisal activities. The UML Ingest diagram was subsequently revised, as reflected in: https://wiki.artefactual.com/wiki/File:CoVArchives_AD3_AcceptSIPforIngest_v4.pdf.

Specifically, the following activities were added to the UML diagram, based on the COP analysis:

- 3.6 – Audit submission and select for preservation
- 3.7 – Notify Producer of appraisal decision
- 3.8 – Evaluate Appeals
- 3.9 – Destroy unselected SIP components

The latest Archivematica distribution is available at: https://www.archivematica.org.

As mentioned above, findings related to TEAM Canada Plenary Workshop #5, Action Item 46 (to review the PREMIS-COP model metadata crosswalk against the COP model metadata) were incorporated into the broader InterPARES general study, *GS15 - Application Profile for Authenticity Metadata*.[34]

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[32] Integrated Definition Function modeling. See: http://www.idef.com/idef0.htm.
[33] InterPARES 3 Project, "TEAM Canada Plenary Workshop #04: Action Items and Decisions," 4 (May 2009).
[34] See: http://www.interpares.org/ip3/display_file.cfm?doc=ip3_canada_gs15_final_report.pdf.