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# Software Requirements Specification

for



**Version 1.0**

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# Table of Contents

<b>1. Introduction .....</b>	<b>1</b>
1.1 Purpose .....	1
1.2 Intended Audience .....	1
1.3 Project Scope .....	1
<b>2. Overall Description .....</b>	<b>2</b>
2.1 Product Perspective .....	2
2.2 Product Features .....	2
2.3 User Classes and Characteristics .....	3
2.4 Operating Environment .....	3
2.5 Design and Implementation constraints .....	4
2.6 User Documentation .....	4
2.7 Project Documentation .....	4
<b>3. System Features .....</b>	<b>5</b>
3.1 Language switcher – Phase I .....	5
3.2 Project Manager and Projects – PHASE I .....	5
3.3 Project browser – Phase I .....	6
3.4 Print tool – Phase I .....	6
3.5 Audio / Video player – Phase I .....	7
3.6 Search Tool – Phase I .....	7
3.7 Spaces – Phase I .....	8
3.8 Online / Offline switcher – Phase II .....	9
3.9 User Management – Phase II .....	9
<b>4. External Interface Requirements .....</b>	<b>11</b>
4.1 User Interfaces .....	11
4.2 Hardware Interfaces .....	15
4.3 Software Interfaces .....	15
4.4 Communications Interfaces .....	16
<b>5. Other Nonfunctional Requirements .....</b>	<b>17</b>
5.1 Performance Requirements .....	17
5.2 Safety and Security Requirements .....	17
<b>6. Other Requirements .....</b>	<b>17</b>

## Revision History

Name	Date	Reason For Changes	Version
First release	12-10-2008	Initial release	1.0

# **1. Introduction**

## **1.1 Purpose**

This document presents an overall description of the Stories Matter software architecture and its main software requirements. The Stories Matter software, developed in two phases, will aim to provide a media annotation tool for oral historians worldwide.

The online and offline versions of the software will operate in both French and English; additional languages may be incorporated at a later date.

Using only open source technology, the software will provide offline and online functionality.

The main application will be built upon the latest version of Adobe Air, an open source software development kit (SDK) that provides a virtual machine (VM) that runs on all major Operating Systems (Mac OSX, Windows, Linux).

The online functionalities will be provided by a Joomla based extension that manages users and projects and provides Content Management System (CMS) features.

## **1.2 Intended Audience**

This document is intended for software developers, documentation writers and for general discussions on the implementation decisions regarding the Stories Matter software.

## **1.3 Project Scope**

The Stories Matter software, as a final product, will allow for the digitization and archiving of digital video and audio materials so that users may annotate, analyze, evaluate and share materials in their collections; it is designed for oral historians by oral historians. By providing an online interface, many users may contribute to a single project. A Project Lead may define a specific scope for each Stories Matter project – making it available to different users.

## **2. Overall Description**

### **2.1 Product Perspective**

Applying digital technologies to the field of oral history is a relatively new phenomenon. At present, there are no specialized tools to assist oral historians working within the digital realm.

This project builds upon work that has been previously undertaken at the Centre for Oral History and Digital Storytelling. The applicability of Interclipper and Vertov have been used to accommodate oral historians needs, but both tools suffer from severe limitations and incomplete features.

Interclipper is a software developed by Documat LLC. Although the software enables a certain amount of annotation and indexing, it can only run locally on a windows platform. Furthermore, Interclipper is closed source, provides no community contribution tools and exports files in the Windows-only ASF format. Additionally, Interclipper was designed as a market research analysis tool repurposed for use by oral historians.

Vertov, a plug-in for the popular Zotero Firefox extension, has tagging features, is open sourced and supports various video formats. Its main drawbacks are a lack of an export feature, firefox dependency, a limited user interface and no collaborative tool.

The Stories Matter project aims to overcome these limitations by complying to the unique needs of oral historians and providing a platform on which to expand and share projects.

The software will be developed in two phases. Phase I will encompass all local functionalities, Phase II will cover server-related features.

### **2.2 Product Features**

The Stories Matter software will preserve the annotation, tagging, indexing and export features from Interclipper and Zotero/Vertov, but will be platform independent, open sourced and collaboratively-focused. The Stories Matter software will initially include both English and French versions of the interface. Additional languages may be added to the system at a later date.

The Stories Matter software will be comprised of these main features:

#### **Project Control Panel**

The project control panel enables the System Administrator to control various projects, archiving old projects and creating new ones. In phase II, the System administrator may also add users.

#### **Projects**

Projects are the main data containers. Projects contain interviews and define user scope. Projects may be public and viewable by guest users and others may be private.

#### **Interviews**

Interviews are either audio or video files that may be turned into clips using the timeline and a user interface.

**Clips**

Clips are the atom of the Stories Matter software. They represent excerpts of an interview.

**Annotation system “Spaces” and search tools**

The annotation system, and its counterpart, the indexing and search features, enable users to append searchable information to any project, interview or clip. These information containers will contain predefined fields for biographical and transcription data as well as user-defined ones.

## **2.3 User Classes and Characteristics**

The software will allow four levels of Access Level Classes (ACL) when running in online and offline modes. User classes will be implemented in both phase I and phase II.

**System Administrator**

The System Administrator will oversee all projects and users. Search capacities are system-wide and all views are accessible. There is a limited number of System Administrators for the entire database. System Administrators are knowledgeable of the inner workings of the system and have access to the servers, database and to install specific extensions to the Content Management System.

**Project Lead**

A Project lead will have full administrative rights on a given project. Search capacities are limited to the project and all views are accessible. There are usually one or two Project Leads for a given project. Project Leads understand all features of the system but require no special technical knowledge.

**Publisher**

A Publisher may add interviews and create and annotate clips. Search capacities are limited to the project and most views are accessible. Publishers are contributors and represent the largest user group. Publishers should be trained to use most of the system functionalities, but do not manage other users.

**Registered User**

A Registered User may create clips out of existing Interviews. Search capacities are limited to the project and most views are accessible. Registered Users are limited contributors and their use of the system varies greatly. Limited training is required for Registered Users.

**Guest**

A Guest may browse a given project, and may be limited to accessing a project, an interview or a clip. Search capacities are limited or non-existing. No training should be necessary for guest accounts.

## **2.4 Operating Environment**

The client interface will run in major operating system (Mac OS X, Windows, Linux) with Adobe Air installed.

The server will be running any Linux distribution running Apache 2.X, PHP 5.X, MySQL 5.X and with ffmpeg installed. The server should have enough hard disk space to accommodate the database, the code base and video hosting.

### Video file sizes

<i>Output size</i>	<i>Bitrate</i>	<i>Filesize</i>
<i>320x240 pixels</i>	<i>400kbps</i>	<i>3MB/minute</i>
<i>480x360 pixels</i>	<i>700kbps</i>	<i>5MB/minute</i>
<i>720x540 pixels</i>	<i>1000kbps</i>	<i>7.5MB/minute</i>

## 2.5 Design and Implementation constraints

### Multilingual support

The software will accommodate multiple languages and will be delivered in English and French.

### License

All source code will be made available through a yet undetermined open source license.

### Delivery

A working version of the project should be complete by the end of 2008.

### Programming Standards

Database design will follow the relational model in 3<sup>rd</sup> Normal Form. The server code will be written following the OOP paradigm, MVC design pattern and will be documented in file headers. Source code and database mapping will follow the ORM design pattern.

The client code will be written using the Adobe Air SDK and will use javascript and Adobe Flash components.

## 2.6 User Documentation

A help manual will be housed within both online and offline versions of the Stories Matter software. Technical documentation and training shall be made available at the Centre for Oral History and Digital Storytelling's discretion. Documentation will be provided in both English and French, but will not include training materials.

## 2.7 Project Documentation

This guide will be continually updated and posted on the project blog. It will serve as the project's main documentation. ( <http://storytelling.concordia.ca/development/> )

## 3. System Features

### 3.1 Language switcher – Phase I

#### 3.1.1 Description and Priority

All aspects of the software will be delivered in both English and French versions. Additional languages may be added to the system. Phase I priority.

#### 3.1.2 Stimulus/Response Sequences

Select language from drop down list: Set new locale and return to previous page.

#### 3.1.3 Functional Requirements

Support additional languages: additional languages may be added.

### 3.2 Project Manager and Projects – Phase I

#### 3.2.1 Description and Priority

This feature provides all functionalities related to Projects. Phase I priority.

#### 3.2.2 Stimulus/Response Sequences

##### **Project Manager**

Create new / edit project : brings up 'Edit project' page

Delete Project: delete from info from database

Open project: opens selected project in the 'project browser' page

##### **Edit project**

Name: text

ACL: drop down select

Creator ID: select

Bibliographical data: text box

Meta data: text box

Associated User id list : multiple selection ( users / access )

**Apply / Save / Cancel**

##### **Project Browser**

Edit Project: brings up the edit project page

Create new / Edit Interview: brings up 'Edit interview page' page

View / Hide project spaces

##### **Edit interview**

Add new video: Sets a path to video file

Add new audio: Sets a path to audio file

Change associated video: Update video link

Change associated audio: Update audio link

Create new / edit clip: brings up the edit clip page  
Back to project: Back to the project browser  
Create clip / Edit clip: bring us to Edit clip  
View / Hide project spaces

#### **Edit Clip**

Export clip: Exports clip to local life (requires ffmpeg)  
View / Hide clip project spaces

### **3.2.3 Functional Requirements**

REQ-1: Annotation tool is common to project / interview / clip.

REQ-2: Export clip time must be reasonable (at most length of clip is time to export)

## **3.3 Project browser – Phase I**

### **3.3.1 Description and Priority**

A mini browser to quickly navigate between clips, interviews and main projects.  
Phase I priority.

### **3.3.2 Stimulus/Response Sequences**

Click on project name: open Project Page  
Click on Interview : open interview page  
Click on clip: open clip page

### **3.3.3 Functional Requirements**

REQ-1: The browser may be hidden from view for more workspace

*See my clips / other clips (Phase II): Show / hide clips created from other people.*

## **3.4 Print tool – Phase I**

### **3.4.1 Description and Priority**

Provides a grid to print out selected spaces from selected clips / projects / Interviews  
Columns are Projects, interviews and clips. Rows are spaces. Phase I priority.

### **3.4.2 Stimulus/Response Sequences**

Click column header: toggles entire column selection.  
Click row header: toggles entire row selection.  
Click on table cell: toggle cell selection  
Click on Print icon: brings up OS print options  
Click on export tool: Exports print report to local HTML.

### **3.4.3 Functional Requirements**

REQ-1: Must be printable to PDF

REQ-2: Must be exportable to HTML file.



## 3.5 Audio / Video player – Phase I

### 3.5.1 Description and Priority

Player used to preview video and audio clips. Phase I priority.

### 3.5.2 Stimulus/Response Sequences

#### **Control bar**

Play / pause: plays or stops the clip.

Stop: stops and seeks first frame.

Rewind (custom play list / interview only): seeks previous clip / cue.

Forward (custom play list / interview only): seeks next clip / cue.

#### **Seek bar**

Insert cue: Inserts cue at current seeker position.

Remove cue: removes selected cue.

Hide cues: hides all cues. New cues are visible.

Create clip from cue: creates a clip from selected cues

### 3.5.3 Functional Requirements

REQ-1: Ability to play 2h videos.

REQ-2: seamless support for audio or video files.

## 3.6 Search Tool – Phase I

### 3.6.1 Description and Priority

Provides filtered searching. Phase I priority.

### 3.6.2 Stimulus/Response Sequences

#### **Search form**

By keyword: And / Or search

By field type: (interview name, interview duration, etc.)

#### **Results**

Paginated results

Clicking on a result item: opens relative item ( clip, interview, project, with relevant space open)

#### **Tag Cloud**

Created and compiled from the 'tags' space.

Click on tag: open search page with relevant results.

### 3.6.3 Functional Requirements

REQ-1: Results are highlighted ( project, clip, interview, audio, video, space, etc.)

## 3.7 Spaces – Phase I

### 3.7.1 Description and Priority

Spaces are text fields used to annotate a clip, interview or project. Some spaces are preset for a given editor, and new spaces may be created. Phase I priority.

### 3.7.2 Stimulus/Response Sequences

Click on main space tab: bring space to forefront

Click on secondary space name: bring space to forefront, move replaced space below

Hide show spaces button : Hides or shows all spaces

#### Main spaces

Interview space

Date of interview: date

Place of interview: geolocation + address

Setting of interview: text box

Duration of interview: hour

Interview rating (content rating): int

Interview language : select box

Brief description of interview (interview abstract)

Date interview added: date

Original medium of interview: text

Location of original interview with contact information for location : geolocator

Transcript Space

Title: text

Content: text box

#### Secondary spaces

Interviewer / interviewee space

Interviewee name (prefix, first name, last name, suffix) : text

Date of birth (interviewee) : date

Age of interviewee: integer

Contact information for interviewee: address, phone number, email address

Interviewee fieldnotes : text box

Interviewer name (prefix, first name, last name, suffix) : text

Interviewer fieldnotes: text box

Reflection Space

Title: text

Content: text box

Tag: text

Meta-Narrative Space

Title: text

Content: text box

Tag: text

Notes/Related Information

Title: text

Content: text box

Associated URL : text

Tag: text

Interviewer name (prefix, first name, last name, suffix) : text

Interviewer fieldnotes: text box

Tag: text

Attachment space

Attachments related to interview/interviewee : file

Ethics form attachment : file

### **Custom spaces**

Title: text

Content: text box

### **3.7.3 Functional Requirements**

REQ-1: Custom spaces may be deleted and created by the user

REQ-2: Spaces created by other users may be filtered out

## **3.8 Online / Offline switcher – Phase II**

### **3.8.1 Description and Priority**

Toggles between online and offline mode. Phase II priority.

### **3.8.2 Stimulus/Response Sequences**

Select Offline mode: disable all online features, return to previous page.

Select Offline mode: authentication, enable all online features, download missing content, synch database, return to previous page.

### **3.8.3 Functional Requirements**

*REQ-1: Online mode: requires a server specification placeholder*

## **3.9 User Management – Phase II**

### **3.9.1 Description and Priority**

This feature provides all user related functionalities. Phase II priority.

### **3.9.2 Stimulus/Response Sequences**

#### **User Manager**

Create new user: brings up blank 'Edit user' page

Delete selected users: Confirmation, delete user from database.

Change user information: brings up blank 'Edit user' dialog box

#### **Edit User**

First Name: text

Last Name: text

Username: text  
Password: password text  
Account Type: select list from ACL  
Avatar: small image upload  
Preferred language: select list

**Apply:** saves changes and stays in Edit User page

**Save:** saves changes and returns to User Manager page

**Cancel:** cancels changes and returns to User Manager page

### 3.9.3 Functional Requirements

REQ-1: Account creation must notify new account holder.

REQ-2: Authorization / Authentication provides Secure login and filtered access.

REQ-3: Access Control Lists Super-Administrator, Administrator, Publisher, Registered user, Guest account

## **4. External Interface Requirements**

### **4.1 User Interfaces**

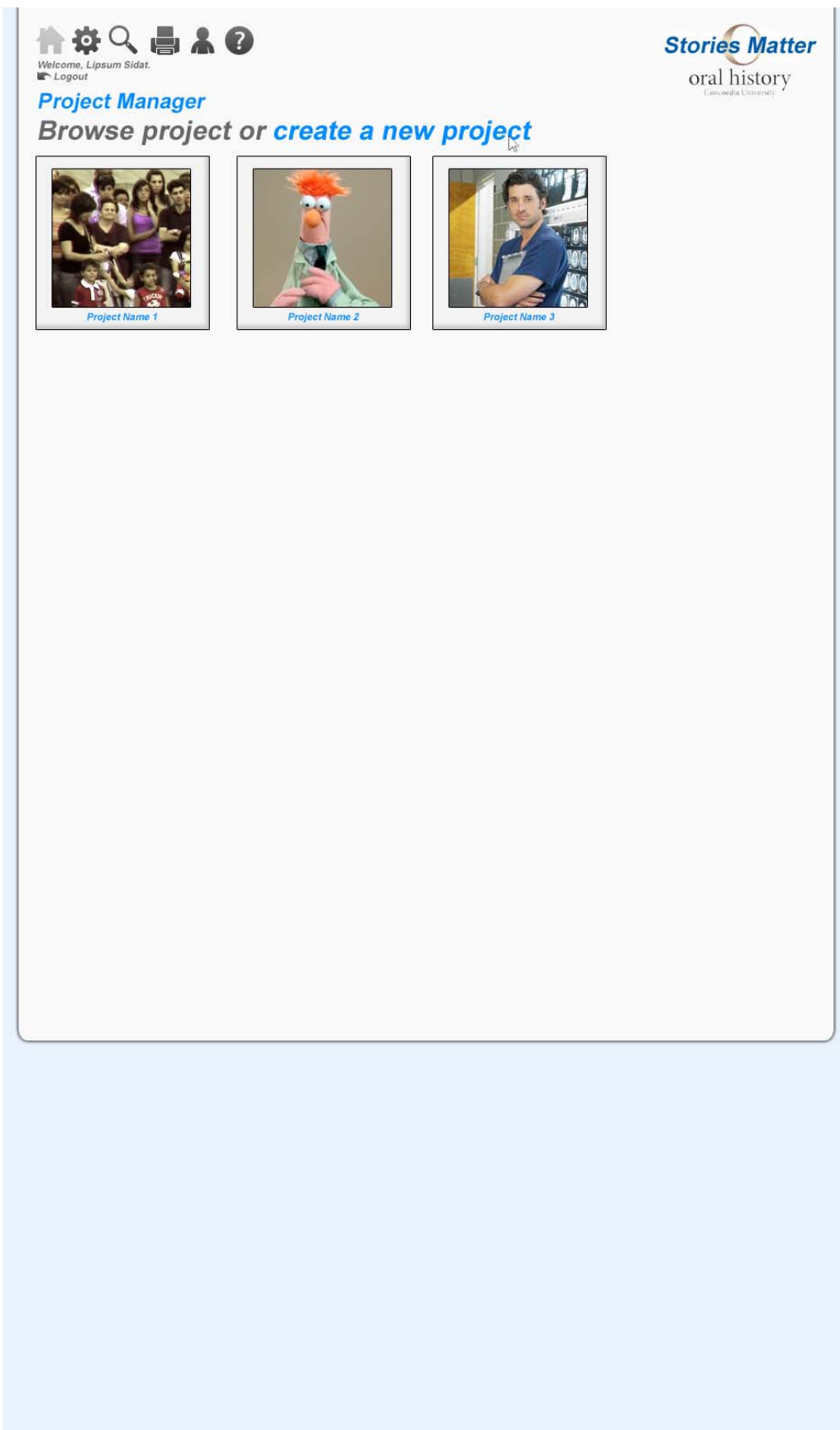
#### **Offline Mode**

The software will use the Adobe Air VM as a GUI interface.

#### **Online Mode**

When in offline mode, the server will also provide a community based-interface. The user interface will be delivered through a web browser using the PHP/MySQL Joomla CMS.

## Project Manager



## Interview Editor

Welcome, Lipsum Sidat.  
[Logout](#)

Stories Matter Interview Editor

projectName / Sample Video Interview 2

projectName

- Sample Video Interview 1
- Sample Audio Interview 1
- Sample Video Interview 2
  - ClipName 1
  - ClipName 2
  - ClipName 3
- Sample Audio Interview 2
- Sample Video Interview 3

ac adipiscing amet  
ante consequat  
curabitur dolor  
feugiat id leo  
malesuada morbi nisl  
nulla phasellus  
pulvinar quis  
rhoncus sed sit  
turpis vestibulum vulputate

02:06

Interview Author: Lipsum Sidat    Total time: 02:11:41    clip start : 00:02:06    clip end : 00:31:41

✕ Clips

[ClipName 1](#)
[ClipName 2](#)
[ClipName 3](#)
[New clip](#)

✕ Spaces

Interviewee bio

Transcript

Interview

Notes/Related Info

First Name

Last Name

Birth

Sex

Additional notes






Tags

Additional spaces:

[Interviewer](#)
[Meta-Narrative](#)
[Attachments](#)
[Custom space 1](#)

[Not Lipsum's Sample Space 7](#)
[Not Lipsum's Sample Space 8](#)

## Print Manager



Welcome, *Lipsum Sidat*.  
[Logout](#)

Stories Matter *Print*

**Print or export to HTML**

	Project 1	Interview 1	ClipXYZ	Interview 2	ClipXYZ2
Interview					
Transcript					
Interviewee					
Interviewer					
Reflection					
Meta-Narative					
Notes					
Custom 1					
Custom 2					



## 4.2 Hardware Interfaces

All interaction with hardware is done through the Adobe Air Virtual Machine (VM).

## 4.3 Software Interfaces

### Offline mode software interface

Adobe Air 1.1 or greater ( <http://get.adobe.com/air/> ) using internal sqlLite database.

On any setup, 15MB of hard drive memory is required to install adobe air and an additional 2MB for the Écoute software. Further space is needed depending on video file sizes.

#### Windows

- Intel Pentium 2GHz or faster processor
- Windows 2000 with Service Pack 4; Windows XP with Service Pack 2; or Windows Vista Home Premium, Business, Ultimate, or Enterprise
- 512MB of RAM; 32MB of VRAM

#### Mac OS X

- PowerPC G4 1.8GHz or faster processor or Intel Core Duo 1.33GHz or faster processor
- Mac OS X v.10.4.9 or later or 10.5.1 (Intel or PowerPC; Intel processor required for H.264 video)
- 512MB of RAM; 32MB of VRAM

#### Linux ( <http://labs.adobe.com/technologies/air/> )

- Processor - Modern x86 processor (800MHz or faster, 32-bit)
- Memory - 512MB of RAM, 128MB of Graphics Memory
- Fedora Core 8
- Ubuntu 7.10
- Open Suse 10.3

These hardware specifications are relatively light by today's standards, since computers are generally equipped with a minimum of 1GB of RAM, 128MB Graphics Memory and 3-4MHz dual or quad processors.

### Online mode server software interface

Apache 2.0 or greater: This open source server interfaces the PHP and Mysql applications for a as a web interface.

ffmpeg library : This open source software converts most video files to flv format.

PHP 5 or greater: The open source php interpreter used to run the server code.

MySql Database 5 or greater: Open source software to run the online database

Joomla 1.5.7 or greater: Open source content management system used for user management, online database management.

## **4.4 Communications Interfaces**

### ***Offline mode***

All communication interfaces are done through the Adobe AIR VM.

### ***Online mode***

Access to the online server by the client is done via http using a web browser (internet explorer 6 or firefox 2 are supported).

Communication between the Stories Matter software and the server is done via AmfPHP 1.9 or greater.

## **5. Other Nonfunctional Requirements**

### **5.1 Performance Requirements**

The software should support 3h long videos / audio streams with no performance penalty. The number of videos / audio streams used in the project will only be limited by individual user disk capacity.

### **5.2 Safety and Security Requirements**

The Adobe Air VM provides limitations to local OS functionality, natively limiting intrusion from outside intervention.

The Joomla CMS protects the database from SQL injection attacks as well as denial of service attacks.

## **6. Other Requirements**

Open Source license: TBD

MultiLanguage Support: Multilingual Support

## Appendix A: Glossary

- **Model-view-controller (MVC)**: an architectural pattern used in software engineering. Successful use of the pattern isolates business logic from user interface considerations, resulting in an application where it is easier to modify either the visual appearance of the application or the underlying business rules without affecting the other.
- **Object-relational mapping (ORM)**: a programming technique for converting data between incompatible type systems in relational databases and object-oriented programming languages.
- **Object-oriented programming (OOP)**: A programming paradigm that uses "objects" and their interactions to design applications and computer programs.
- **MySQL**: a open-sourced relational database management system which has more than 11 million installations. The program runs as a server providing multi-user access to a number of databases.
- **PHP**: an open source computer scripting language, originally designed for producing dynamic web pages.
- **AMF**: a binary format used primarily to exchange data between an Adobe Flash application and a database.
- **Content Management System (CMS)**: a computer application used to create, edit, manage, and publish content in a consistently organized fashion.
- **Virtual Machine (VM)**: a software implementation of a machine (computer) that executes programs like a real machine.
- **Adobe Integrated Runtime (AIR)**: a cross-operating system runtime that lets developers combine HTML, Ajax, Adobe Flash, and Flex technologies to deploy Rich Internet applications (RIAs) on the desktop.
- **Rich Internet applications (RIAs)** are web applications that have the features and functionality of traditional desktop applications.

## Appendix B: Issues List

### **Export feature**

*The Export feature currently depends on Adobe Air support of external applications. As of Adobe AIR version 1.5, this feature is not yet supported, but is requested by many software developers. A default export to FLV will be supported, and if external applications may not be launched via Adobe AIR, video exportation will be done with the help of a batch file generated by the application.*

## **Appendix C: References**

Project blog: <http://storytelling.concordia.ca/development/>

Adobe Air : <http://get.adobe.com/air/> , <http://labs.adobe.com/technologies/air/>

Joomla CMS: <http://www.joomla.org>

Interclipper: <http://interclipper.com>

Vertov : <http://digitalhistory.concordia.ca/vertov/>

Zotero : <http://www.zotero.org/>

## Appendix D: Project Milestones

### Phase I

<i>Milestone / Task</i>	<i>Start date</i>	<i>End date</i>
Adobe Air project setup Local Database setup Multilingual support setup Online tree	13 Oct 2008	20 Oct 2008
FLV Video Player Mp3 Audio Player	20 Oct 2008	27 Oct 2008
Project/Interview/Clip Managers	27 Oct 2008	10 Nov 2008
Spaces	10 Nov 2008	17 Nov 2008
Search engine, tag cloud	17 Nov 2008	24 Nov 2008
Print Tool	24 Nov 2008	1 Dec 2008
Export Tool	1 Dec 2008	8 Dec 2008
Documentation French Translation	8 Dec 2008	15 Dec 2008
Debug, optimization, user feedback – CURA project	15 Dec 2008	25 Feb 2009
Training	26 Jan 2009	26 Jan 2009

### Phase II

<i>Milestone / Task</i>	<i>Start date</i>	<i>End date</i>
Apache, php, mysql, ffmpeg server setup Joomla CMS Installation	26 Feb 2009	2 Mar 2009
Server side User management	2 Mar 2009	16 Mar 2009
Client side User management	16 Mar 2009	23 Mar 2009
Online Offline Switcher, Server Synch, AMFPhp component	23 Mar 2009	6 Apr 2009
Documentation French Translation	6 Apr 2009	13 Apr 2009
Debug, optimization, user feedback	13 Apr 2008	30 Apr 2009