

Technical Specifications for the Development of Virtual Museum of Canada (VMC) Virtual Exhibits Investment Program Products

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www.virtualmuseum.ca
vmc.historymuseum.ca

Canada¹³¹

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A) Notes on Terminology

MUST: This word indicates an absolute requirement.

MUST NOT: This phrase indicates an absolute prohibition.

NOT: This word indicates an absolute exclusion.

MAY: This word indicates an optional course of action that is neither required nor prohibited.

SHOULD: This word indicates a recommended course of action that may in some circumstances be ignored, the full implications of which must be understood before implementing such a course of action.

SHOULD NOT: This phrase indicates a course of action that is not recommended, but in some circumstances is permitted, the full implications of which must be understood before implementing such a course of action.

B) Accessibility

To ensure that the VMC and its Virtual Exhibits is accessible to the widest population possible, all Virtual Exhibits **MUST** conform to the industry standard known as the Web Content Accessibility Guidelines (WCAG) 2.0 as defined by the World Wide Web Consortium (W3C).

These guidelines ensure that web content is accessible not only to those with “traditional” tools (i.e. desktop computer and a web browser) but also to people with disabilities who may be accessing content in a less traditional method or using less traditional tools and technologies.

WCAG 2.0 is based on 4 principles:

- the product must be **perceivable**
- the product must be **operable**
- the product must be **understandable**
- the product must be **robust**

Each principle has a number of guidelines and success criteria. The following is a general summary of these criteria. Links are provided to the full description as found on the official W3C website. Applicant organizations are strongly encouraged to familiarize themselves with these guidelines as they will significantly impact the development of your product.

1. The product must be PERCEIVABLE

Information and user interface components must be presentable to users in ways they can perceive.

- Text alternatives **MUST** be provided for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.
 - *Example:* Alternative texts (Alt text/Alt tags) included to act as a textual replacement for its image **MUST** be rich, descriptive and sufficiently detailed. They **MUST** describe the content of the image and the image's role on the page. Alternative text **MUST** be of a reasonable length. 125 characters or less is recommended.
 - *Example:* Non-text content **MUST** also be available as a text-only mode alternative and **MUST** adapt its presentation to the user's device. Some user agents have limited support for non-text objects and images may be shrunk by some user agents and become meaningless.
- Alternatives for time-based multimedia (e.g. video) **MUST** be provided.
 - *Example:* Audio-only clips **MUST** have text transcripts; video-only clips **MUST** have a transcript and synchronized multimedia (audio-video) clips **MUST** include synchronized captions as well as a full text transcript.
- Content **MUST** be created in such a way that it can be presented in different ways without losing information or structure.
 - *Example:* Different types of information that are often encoded in presentation are also available so that they can be presented in other modalities. Information embedded in a particular presentation must be in such a way that the structure and information can be programmatically determined by the assistive technology, and be rendered in other formats as needed by the user.
 - *Example:* For tablets or smartphones, all content **MUST** be adapted to the display size, be structured and prioritized logically to facilitate the access and user interaction to all information. Content information **SHOULD** be reduced in size or length while preserving the richness of the user's mobile Web experience. Essential information and structure **MUST NOT** be lost in the process. The use of tables **SHOULD** be avoided on limited screen sizes and may result in the user having to scroll horizontally and vertically to read them. Information **MUST NOT** be conveyed only with colour.
- The visual presentation of text and images of text **MUST** meet the minimum requirements for colour contrast as per the W3C algorithm. Many tools are available to facilitate this effort such as the "Colour Contrast Analyser": <http://www.paciellogroup.com/resources/contrastanalyser/>

The exhibition **MUST** comply with all success criteria up to and including WCAG 2.0 Level AA related to the Perceivable principle. Full details and success criteria can be found here:

<http://www.w3.org/TR/WCAG20/#perceivable>

2. The product must be OPERABLE

User interface components and navigation must be operable.

- All functionality **MUST** be keyboard accessible. This requirement includes the means to fill in online forms, video and audio controls, as well as navigational aids.
- Any keyboard operable user interface **MUST** have a mode of operation where the keyboard focus indicator is visible.
 - *Example:* The product **MAY** include a navigable breadcrumb trail. Breadcrumb trails are optional. IF the product includes a breadcrumb trail:
 - all levels of navigation **MUST** be represented and **MUST** be active, and
 - each link **MUST** make sense on its own.
 - *Example:* For tablets or smartphones, if a breadcrumb trail is included, it **MUST NOT** take precedence over conveying the most important and relevant information first. Users **SHOULD NOT** have to scroll significantly to find the primary content of the page
- Ways **MUST** be provided to allow users enough time to read and use the content.
 - *Example:* Users must be able to complete tasks initiated on the content within their own individual response times. Users with disabilities (e.g. blindness, low vision, dexterity impairments, and cognitive limitations) may require more time to read content, performing functions or may be accessing content through an assistive technology.
- Content **MUST NOT** be designed in a way that is known to cause seizures.
 - *Example:* Web pages **MUST NOT** contain anything that flashes more than three times in any one-second period.
- Ways **MUST** be provided to help users navigate, find content, and determine where they are in the exhibit.
 - *Example:* To meet this requirement: apply a consistent navigation, add links and targets to bypass blocks of content such as the navigation, and create link text that makes sense out of context.
 - *Example:* A descriptive page title **MUST** be provided to help identify the content and adjusted to fit smaller screens without being truncated. Navigating through the various fields, objects and controls on the page **MUST** be presented in a logical order. This order **MUST** remain consistent and usable when keyboard tabulation order is used. Targets of links **MUST** be clearly identified. Links which target resources **MUST** specify large sizes and non-textual formats for users to make an assessment before the link is followed.

The exhibition **MUST** comply with all success criteria up to and including WCAG 2.0 Level AA related to the Operable principle. Full details and success criteria can be found here:

<http://www.w3.org/TR/WCAG20/#operable>

3. The product must be UNDERSTANDABLE

Information and the operation of user interface must be understandable

- Text **MUST** be readable and understandable. This is achieved by identifying the language of the page, identifying text of a language other than declared for the page, and providing the expanded form or meaning of abbreviation/acronyms (please note, this is a WCAG 2.0 Level AAA item that the VMC is including).
 - *Example:*
 - Avoid using text of other languages in alternative text and title elements;
 - The language attributes **MUST NOT** be declared within other attributes such as the alternative text attribute and the title elements attribute, and
 - Acronyms and abbreviations **MUST** be either spelled out or marked up using the HTML <abbr> element.
 - *Example:* For tablets or smartphones, text **SHOULD** also be clear and suitable for smaller screens.
- Long and complex sentences or jargon are not appropriate for finding and understanding the requested information.
- Web pages **MUST** appear and operate in predictable ways by providing a consistent navigation and consistent identification.
 - *Example:* Optimized versions for tablets or smartphones **MUST NOT** open multiple windows or pop- up, create periodically auto-refreshing pages and redirect pages automatically.
- Web pages **MUST** provide input assistance to help users avoid and correct mistakes.
 - *Example:* For tablets or smartphones, labels on form controls **MUST** also be worded clearly, properly sized and associated explicitly in the code to form controls. Labels should be displayed consistently and positioned close to form controls.

The exhibition **MUST** comply with all success criteria up to and including WCAG 2.0 Level AA related to the Understandable principle. Full details and success criteria can be found here:

<http://www.w3.org/TR/WCAG20/#understandable>

4. The product must be ROBUST

Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.

- Products **MUST** be compatible with the current platforms and browsers including assistive technologies.

- *Example:* The core content of a page **MUST** be accessible without images, javascript, style sheets, high-speed internet, mice and on platforms such as text-only browsers and screen-readers.

The exhibition **MUST** comply with all success criteria up to and including WCAG 2.0 Level AA related to the Robust principle. Full details and success criteria can be found here:

<http://www.w3.org/TR/WCAG20/#robust>

Further details, criteria and techniques regarding WCAG 2.0 AA can be found on the W3C's quick reference guide: <http://www.w3.org/WAI/WCAG20/quickref/>

C) Best Practices

The VMC expects all Virtual Exhibitions to be produced to the highest level of current web development standards and best practices. This includes the choices of technologies, the programming languages, platforms and frameworks chosen, coding techniques and infrastructure and architecture plans.

The following sections detail specific technical best practices that are required for all virtual exhibitions.

1. Baseline Principles

The programming techniques applied to the development of a Virtual Exhibition must reflect current industry standards and best practices.

1.1 Responsive Design

The Virtual Exhibition product **MUST** be programmed with Responsive Design principles: a single version of the product with a fluid presentation layer that adapts to any screen size.

The following techniques are expected to be used when using a Responsive Design approach:

- Delivering the pages of the site to all devices with the same URL and the same content, but not necessarily with the same structure.
- Fluid grid design concept
- Flexible images
- Media queries to generate custom layout

The Virtual Exhibition can be developed using programming frameworks that support or are geared towards Responsive Design such as Bootstrap, Foundation or responsive themes within a Content Management System.

1.2 Progressive Enhancement

The product **MUST** follow a Web design approach based on [progressive enhancement](#): The product is architected for a basic level of user experience that all browsers will be able to provide when rendering the product, but more advanced functionality will automatically be available to browsers that can use it.

Note: For example, in certain circumstances a part of an exhibit could be developed using a non-text format that requires users to have a special plug-in or add-on installed in their browser. In this case, the information is probably not accessible to those using assistive technologies such as a screen reader, and certainly not to everyone using desktop PC and Macintosh, tablet and smartphone platforms.

Instead, create a simple HTML text version and include it as the default content in the same HTML page. This guarantees that all users will be able to use this part of the exhibits. By additionally linking this page to an external JavaScript file that checks if the browser has the appropriate version of the special plug-in or add-on, the page's HTML code could be dynamically modified by the JavaScript (assuming that the browser is capable of implementing the required JavaScript methods) to load a special version offering a link to the HTML version. As a result, all users are presented with the version that their browsers support and a link to the other version of the content as well as a link to download the needed plug-in.

Note: By following a progressive enhancement design, the content text and links placed near the top of a page will be more accessible and prevalent to search engines than content placed near the bottom of a page.

Note: For tablets and smartphones, a progressive enhancement design approach **MUST** include a simple HTML text version before content involving images and multimedia. Moreover, the design should use a simplified navigation, minimizing the size of HTML pages, CSS and JavaScript files, having several server-side versions of images and multimedia objects to adapt to various screen format and promoting the use of HTML5 caching technology for improving the responsiveness of the product even when the network is not available and enhancing the user experience.

A user **MUST** be able to access the main version of the product first. The product's accessibility **MUST NOT** be accommodated through the provision of a secondary (e.g. text-only) version of the site or pages. Only the components requiring JavaScript can be duplicated.

Note: The desktop and all optimized versions **MUST** serve the same HTML from the same website and the same set of URLs (e.g. separate desktop and mobile URLs are **NOT** supported). See the previous notes section on mobile optimization.

1.3 Client-Side Scripts

Client-side scripts **MUST** be provided as part of a modular design, unobtrusive and completely separate from page content and structure, and referenced as external files from within a page's `head` element. Inline or embedded client-side scripts **MUST NOT** be used.

Note: Inline event handlers (e.g. `onclick`, `onfocus`) in the HTML layer are prohibited. Event handlers **MUST** be dynamically written to the DOM using valid, unobtrusive DOM-scripting techniques.

Note: In the case that a third-party script cannot easily be implemented unobtrusively, permission to use inline scripts or script elements **MUST** be requested from VMC.

Note: In the case of the use of scripts from a third party, a use diagram and the versions of the active scripts **MUST** be provided to VMC at the quality control stage.

Note: In the case of optimization for mobile, client-side scripts **MUST** be used sparingly because they may not be supported by some mobile devices and may cause an increase in time and costs in page display.

Client-side scripts **MUST** test for and execute based on the user agent support for the critical DOM objects implemented in the scripts, as opposed to testing for user agent strings or otherwise “browser sniffing”. This ensures that the execution of the script will be based on the supported DOM objects or methods and not by the browser agent used e.g. Supported feature detection instead of browser detection.

1.4 Script Independence

The product’s core content and functionality **MUST** be available without client-side scripts. Please note that JavaScript is considered a client-side script.

Note: Behavioral enhancements implemented solely through client-side scripts are permitted but **MUST** be kept to a minimum while presentational enhancements **MUST** be implemented through CSS consequently to a Responsive Web design. The product’s core content and functionality **MUST** remain even if client-side scripts are disabled or not supported.

1.5 CSS Independence

The product’s core content and functionality **MUST** be available without Cascading Style Sheets (CSS) when accessed through a desktop browser. This does **NOT** apply to tablets and smartphones as CSS **MUST** be enabled for mobile optimization through a Responsive Web design.

The following measures **MUST** be adopted:

- when CSS is not supported, the content **MUST** be presented in a logical reading/viewing sequence;
- the sequence of the content **MUST** be consistent with the presentation achieved with CSS. The sequence in which content is presented affects its meaning;
- all font sizes **MUST** be set using a relative measurement such as `em` or percentage (%) to ensure text can be enlarged without losing information or without being truncated, and
- when a background image is used, a background colour **MUST** also be set.

1.6 Code Formatting

Semantic markup (`<h1>`, `<h2>`, ``, `<abbr>` etc.) **MUST** only be used to convey meaning (i.e. to convey the semantics) of content, rather than as a means to do visual styling.

Note: Pages **MUST** be structured to include proper Header elements level (H1 to H6) indicating the level or priority of the page title, page section and sub-section titles.

The developer **MUST** follow best practices in the correct formatting of code wherever possible. For example, line breaks, indentation and the grouping of lines of code as well as the spaces between the tags.

Note: This requirement does not apply in the case of external third-party libraries such as JQuery or code that has undergone minification

2. Baseline Technologies

Technologies must be chosen to ensure that the product's content will be available to the greatest number of visitors regardless of the technical configuration of their system or device.

2.1 HTML5

The exhibition and all its pages **MUST** use only [HTML5](#) for semantic mark-up and the content structure on the Web pages. During the development cycle of the Virtual Exhibition and up until it goes into production, only HTML5 tags supported by the latest versions of the major PC and Mac browsers currently in use: Internet Explorer 9+, Firefox, Google Chrome and Safari can be used as part of the VMC Investment Program. The tags "frameset" and variations of XHTML 1.0 Strict and XHTML5 tags **MUST NOT** be used.

The product and all of its pages, including mark-up generated or modified dynamically by client-side DOM scripts, **MUST** validate using the latest available W3C Markup Validation Service for HTML5.

Note: VMC **MAY** require from the client proof that the HTML markup of the product has been successfully validated before proceeding further with any technical evaluation. The W3C Mark-up Validation Service is available at <http://validator.w3.org/>. This [W3C service](#) integrates with [validator.nu](#) engine for HTML5 support.

2.2 Cascading Style Sheets (CSS)

Presentation and style (e.g. visual layout and design) **MUST** be applied through the use of valid Cascading Style Sheets (e.g. CSS 3).

Note: CSS3 cascading style sheets **MUST** be used as the main visual layout and design standard for the product. It is not required that every browser show the same CSS presentation of the exhibition's content. During the development cycle of the Virtual Exhibition and up until it goes into production, page presentation should be verified in the latest version of the current principal browsers (e.g., Internet Explorer 9+, Firefox, Google Chrome and Safari).

Note: Organize documents so that the desktop version may be read without style sheets. To meet this requirement, all pages **MUST** be tested with CSS disabled to ensure the content is presented in a logical order when CSS are not supported. This does **NOT** apply to tablets and smartphones as CSS **MUST** be enabled for mobile optimization through a Responsive Web design.

Note: For tablets and smartphones, the presentation and style **MUST** be adaptable to various media types through the use of [Media Queries](#) and are dependent on supported features (e.g., display resolutions, aspect ratios, width, height and colour).

CSS **MUST** be completely separate from page content and structure, and referenced as external files from within a page's `head` element. Inline or embedded styles **MUST NOT** be used.

Note: CSS rules called dynamically by client-side DOM scripts **MUST NOT** be written inline. Instead, class names **SHOULD** be dynamically added to the relevant HTML elements, thus invoking the associated CSS rules contained in an external style sheet.

2.3 Secure Socket Layer (SSL)

The product **MUST** use the Secure Sockets Layer (SSL) protocol when users are required to input a username and password (i.e., log in).

Note: Permission **MUST** be obtained from VMC for products soliciting users for any personal information including, but not limited to, name, address, email address, telephone number and credit card number to be stored by the product and kept for use by the institution responsible for the product.

Note: It is not necessary to use SSL when gathering information through form-based email feedback, nor when soliciting a user's nickname only, for example, to store a high score in an online game.

All hyperlinks on pages using SSL to pages that do not use this protocol **MUST** use relative URLs once the user has sent a request to stop using SSL (e.g., logout after opening a session).

3. Deployment Requirements

When a Virtual Exhibition is deployed, the way the directories, files and URLs are configured should be clear, concise and logical. The following are the VMC requirements with respect to the deployment of a product.

3.1 Character Encoding

Every product page **MUST** use and declare UTF-8 character encoding.

Note: For more information about character encoding and the meta charset attribute in HTML5, go to the [W3C Declaring character encodings](#) site.

3.2 Content Management Systems (CMS)

- The usage of a CMS is **NOT** mandatory but optional;
- It is the institution's responsibility to keep its CMS up-to-date for the duration of the contract;
- All exhibitions developed using a CMS **MUST** be converted into independent static HTML pages for the various Quality Control stages and when they are put into production;
- Exhibits developed using a CMS **MUST** meet all requirements stated in this document.
- No exemption will be allowed for any violations of *the Technical Specifications for the Development of Virtual Museum of Canada (VMC) Virtual Exhibits Investment Program Products*

3.3 File Directory Structure

3.3.1 File and Directory Structure and Naming

The file naming and directory structure of the publicly available files **MUST** be simple and clear with concise naming and minimal repetition and duplication of files or directory names. It must also adequately convey the language of the site through proper naming conventions.

Publicly available product files (e.g. HTML, images, CSS, JavaScript) that are common to all language versions of the product **MUST** be placed in unique directories located in the product's top or root level directory, and **MUST NOT** be duplicated for each language version of the product.

The naming conventions for files and directories depend on how the Virtual Exhibition is handling bilingualism:

The Virtual Exhibition **MAY** have a language directory under which all publically available files and directories for the Virtual Exhibition will be. If this is the case,

- the file and directory names **MUST** be in the language indicated by the language directory under which they are put
- the Virtual Exhibition **SHOULD** have a unilingual domain name i.e. the same domain name for both languages of the Virtual Exhibition

Examples

- http://www.ontario.com/eng/the_people/before-2000/
- http://www.ontario.com/fra/les_peuples/avant-2000/

The Virtual Exhibition **MAY** have NO language directory under which all publically available files and directories for the Virtual Exhibition will be. If this is the case,

- If the Virtual Exhibition has a unilingual domain name i.e. one domain name for both languages of the Virtual Exhibition, the file and directory names under the language directory **MUST** be bilingual i.e. contain both French and English in the name unless the name is a single word that has the same meaning in both languages
- the file and directory names under the language directory **MUST** end with the ISO-639-2 three-letter code (i.e., "fra" and "eng") reflecting the linguistic version of the file/directory

Examples

- http://www.ontario.com/les_peuples-the_people/avant_2000-before_2000-eng/
 - http://www.ontario.com/les_peuples-the_people/avant_2000-before_2000/les_jeunes-youth-fra.php
 - <http://www.ontario.com/province/sport/hockey/joueurs-players-eng.php>
 - <http://www.ontario.com/province/sport/hockey-fra/>
- If the Virtual Exhibition has a bilingual domain name i.e. a different domain name for both languages of the Virtual Exhibition, the file and directory names under the language directory **SHOULD** be unilingual i.e. be named according to the language that the domain name is in unless the filename is a single word that has the same meaning in both languages
 - the file and directory names under the language directory **MUST** end with the ISO-639-2 three-letter code (i.e., “fra” and “eng”) reflecting the linguistic version of the file/directory

Examples

- http://www.nova-scotia.com/the_people/before_2000-eng/
- http://www.nouvelle-ecosse/les_peuples/avant_2000-fra/

3.3.2 Directory Browsing

Directory browsing **MUST** be disabled.

3.4 File and Directory Naming Conventions

3.4.1 Characters

The names of publicly available files and directories **MUST** use only the following characters:

- lower-case letters (i.e., a–z), and
- numbers (i.e., 0–9).

The following characters **MUST** only be used for:

- a hyphen (-) **MUST** only be used as a separator between equivalent bilingual words, phrases or abbreviations, and the ISO-639-2 three-letter code. Hyphens occurring naturally in words or phrases **MUST** be omitted and the resulting space collapsed, e.g. “avant-garde” becomes “avantgarde”, and an underscore (_) **MUST** only be used as the replacement for spaces occurring naturally in terms used for filenames, e.g. “new events” becomes “new_events”.

3.4.2 Naming

The names of publicly available files and directories whose content is **NOT** the same for both French and English versions of the product **MUST** be descriptive and comprise some or all of the following based on the applicable situation as described in 3.3.1:

- a French word, phrase or abbreviation, followed by a hyphen and an equivalent English word, phrase or abbreviation, followed by a hyphen and the ISO-639-2 three-letter code (i.e., “fra” and “eng”) reflecting the linguistic version of the file, or
- a single word, phrase or abbreviation that is the same in both languages, followed by a hyphen and the ISO-639-2 three-letter code (i.e., “fra” and “eng”) reflecting the linguistic version of the file or
- a single word, phrase or abbreviation in one language, followed by a hyphen and the ISO-639-2 three-letter code (i.e., “fra” and “eng”) reflecting the linguistic version of the file

Examples:

- index-fra.html
- index-eng.html
- entete-header-fra.html
- entete-header-eng.html
- logo-fra.jpg
- logo-eng.jpg
- liste_de_membres-members_list-fra.html
- liste_de_membres-members_list-eng.html
- lm-ml-fra.html
- lm-ml-eng.html

3.5 Home Page URLs

The URLs for the homepage of the Virtual Exhibition **MUST NOT** include any URL query string name/value parameters.

Note: The settings of the website **SHOULD** be set so that the homepage URL does not display the homepage filename.

3.6 Relative URLs

All URLs for product pages and resources **MUST** be relative (i.e., not absolute), with the exception of URLs used in hyperlinks from SSL-secured pages to non-SSL-secured pages.

4. Technical considerations of specific content pages

The VMC requires that certain pages are included within a Virtual Exhibition and have consistent user interface and user experience features. The following are the VMC requirements with respect to specific pages that will be part of your Virtual Exhibition.

4.1 Copyright

4.1.1 The Copyright Statement

The product **MUST** include for each language version a full copyright statement identifying all rights holders.

4.1.2 Location

The notice of copyright **MAY** be placed in a section on copyright, on the information page or on a separate Web page for copyright.

4.1.3 Symbol

In the case where the copyright symbol, ©, appears on every page of the product and on the Information page that hyperlinks to a page with the full copyright statement, then the name of the copyright holder, the year in which the product was launched and the statement “All Rights Reserved”, **MUST** complete the statement.

Example: © Museum of History 2013. All Rights Reserved.

Note: If the institution holding the copyright is officially bilingual, use the institution’s English name in the English version of the product, and the institution’s French name in the French version. If the institution is unilingual, use the same unilingual name in each language version. The lang attribute for HTML5 documents **MUST** be declared for a unilingual institution name when on a page where another language is used.

4.2 Credits

4.2.1 Credits Statement

The product **MUST** include a page with full credits for each language version.

4.2.2 Acknowledge the financial participation of the Government of Canada

The statement **MUST** acknowledge the financial participation of the Government of Canada as follows:

English:

This online exhibition was developed with the support of the Virtual Exhibits Investment Program, Virtual Museum of Canada. The Virtual Museum of Canada is managed by the Canadian Museum of History, with the financial support of the Government of Canada.

French :

Cette exposition en ligne a été réalisée grâce au Programme d'investissement pour les expositions virtuelles du Musée virtuel du Canada. Le Musée virtuel du Canada est administré par le Musée canadien de l'histoire avec le soutien financier du gouvernement du Canada.

4.2.3 Links from the Credits Page

The Credits page (as required in the Content Requirements) **MUST** name and provide hyperlinks, if available, to all institutional partners involved with the product.

4.3 Feedback Mechanism

The product **MUST** include for each language version a simple HTML form that allows for audience feedback. The feedback form **MUST** be configured to send an email both to the institution responsible for the product, and to VMC (at infovmc@historymuseum.ca for the English version of the product, and infovmc@museedelhistoire.ca for the French version), with a clear identification of the product name in the subject line.

The feedback form **MUST** be organized in a logical order. The form **MUST** include the following elements:

- An email field, comments text area, and a submission button followed by a clear button.
- Labels **MUST** be associated with their controls and logical grouping of form elements **MUST** be contained with the `<fieldset>` with a `<legend>` for each group.

Users **MUST** be advised that their feedback messages are also being forwarded to VMC, and be provided with a hyperlink to the VMC Privacy Policy (see the example below). Alternatively, information that identifies the user **MAY** be stripped from the feedback.

English Message Example:

Your comments will also be forwarded to the Canadian Museum of History (CMH), which has overall responsibility for the Virtual Museum of Canada (VMC), to be used as part of its audience research. Please see the VMC Privacy Policy for more information.

French Message Example:

Vos commentaires seront également acheminés au Musée canadien de l'histoire (MCH), qui a la responsabilité globale du Musée virtuel du Canada (MVC). Ils seront utilisés à des fins de recherche sur le public. Veuillez consulter la Politique du MVC sur la protection des renseignements personnels pour de plus amples renseignements.

VMC Privacy Policy URL - English:

<http://www.virtualmuseum.ca/important-notice/>

VMC Privacy Policy URL - French:

<http://www.museevirtuel.ca/avis-importants/>

Users **MUST** be advised of the privacy issues associated with sending feedback through email by being provided the following notice:

English:

The Internet is a public forum and electronic information can be intercepted. For reasons of security and privacy, we ask that you not send us any personal or confidential information, such as your Social Insurance Number (SIN), home or business address.

French:

L'Internet est un forum public et l'information électronique peut être interceptée. Pour des raisons de sécurité et de respect de la vie privée, nous vous demandons de ne pas nous faire parvenir de renseignements personnels ou confidentiels, tels votre numéro d'assurance sociale, l'adresse de votre domicile ou de votre bureau.

4.4 Sitemap

4.4.1 Format

The product **MUST** include a sitemap page for each language version, (i.e., a hierarchically organized or nested list of hyperlinks to all of the major sections and pages of the product at least two directory levels deep) presented in a format that uses text hyperlinks, as opposed to graphical hyperlinks or buttons. The sitemap **MUST** be hyperlinked from the Information page.

Note: To increase the ability of search engines to properly index all product pages, it is strongly suggested that the product also implement an [XML Sitemap](#).

Note: For tablets or smartphones, the sitemap page **MUST** also be optimized to fit small screens.

4.4.2 Location of Sitemap

Every product page **MUST** include a text hyperlink to the sitemap in the appropriate language to help ensure that human users and search engines can find every page of the product.

Note: For tablets or smartphones, the hyperlink **MUST** appear after the page navigation elements leading to more prevalent content.

4.5 Navigation

4.5.1 Language Navigation

The product **MUST** include a unilingual home page for each language version of the product.

Every product page **MUST** include a hyperlink to the product's other language version(s). This hyperlink **MUST** be visible without scrolling the page at a screen resolution of 1024 x 768 pixels, and direct the user to the same page in the other language.

Note: For tablets and smartphones, the placement of this hyperlink **MUST NOT** take precedence over the main navigation options and important information content, and **MAY** require scrolling to access this information.

4.5.2 Home Page Navigation

Every product page **MUST** include a hyperlink to the unilingual home page in the relevant language.

Note: The home page hyperlink **MUST** be placed last in the navigation options for tablet and smartphone optimized versions of the product.

4.6 Secondary/Pop-up Windows

The product **MUST NOT** open links in new windows or tabs except for in the following situations:

- opening a page containing context-sensitive information (such as help instructions), or an alternate means of completing a form field (such as a calendar-based date picker), in the same window or tab will significantly disrupt a multi-step workflow (such as filling in and submitting a form), or
- opening a page outside a secure session in the same window or tab will break or destroy the current secure session.

Note: Users **MUST** be warned if a link will open in a new window or tab.

Note: In the case of optimizing for mobile, pop-ups are **NOT** allowed.

4.7 Product Title

Every product page **MUST** include the product's main title as HTML to identify the page's content as part of the product.

Note: Images **MAY** be used to replace the HTML text version of the product's main title, but **MUST NOT** prevent assistive technologies from accessing the replaced text.

4.8 VMC Logo

Every product page including the Splash page **MUST** display the appropriate VMC logo image in the page's top right-hand corner and without any image border. Only language toggle links can be placed above the VMC logo. No items **MUST** be found to the right of the VMC logo.

Note: VMC will provide a copy of the VMC logo upon request. Different versions of the logo are available for greater compatibility with various visual designs and for optimization versions of the product for smartphones. The VMC logo **MUST** be implemented using the following HTML code to load and hyperlink the logo image:

Logos for desktop and tablets:

English:

```
<a href="http://www.virtualmuseum.ca"></a>
```

French:

```
<a href="http://www.museevirtuel.ca"></a>
```

Note: Replace the `src` attribute in the code above with the correct file path for the logo image used in the product.

Logos for smartphones:**English:**

```
<a href="http://www.virtualmuseum.ca"></a>
```

French:

```
<a href="http://www.museevirtuel.ca"></a>
```

Note: Replace the `src` attribute in the code above with the correct file path for the logo image used in the product.

The VMC logo image **MUST NOT** form part of a client-side image map or CSS background-image without VMC's expressed approval.

4.9 HTML Title Element

Every product page **MUST** include, within its `head` element, a `title` element containing a meaningful and keyword-rich title that is no more than 60 characters in length and unique to that page's content. The title element **SHOULD** use the title of the page, if it reflects the content of the page.

Note: As an important page element from the perspective of search engine optimization (SEO), the `title` element's content **MUST** be written in the language of the page from most specific to least specific, with the unique page title coming first, the product's section title second and the product's main title last, separated by a pipe character (|).

HTML title on unilingual pages: metadata **SHOULD** be in the language of the page.

Syntax should be as follows:

```
<title>About Dr. Neville | Specialized Practitioners | Doctors in the North</title>
```

HTML title on bilingual pages: Both French and English metadata **SHOULD** be entered in the same element. Enter first the title in the primary official language of the province where resides the server hosting the product, followed by the title in the other official language, separated by a pipe character (|).

For example, the syntax should be as follows if the product is hosted on a server in Quebec:

```
<title>Musée virtuel du Canada | Virtual Museum of Canada</title>
```

4.10 Banners, Headers and Footers

The product **MUST NOT** use corporate or institution-branded website navigational elements, such as banners, headers or footers, without VMC's approval.

5. Content Types and Formats

5.1 Plug-ins and Specialized Software

The use of a plug-in or special software to view interactive content **MUST** be considered as a [Progressive Enhancement](#) of the main simple text HTML version.

Note: A plug-in **MUST NOT** be used in place of standard formats available and supported by HTML5 and the major browsers: Internet Explorer 9+, Firefox, Google Chrome, Safari and those of mobile devices for interactive display of content (e.g. MP4, MP3, WebM, Ogg, Wav, Canvas).

Thus if any product content still requires a plug-in or specialized software to be viewed, the following actions are required:

5.1.1 Accessibility

A plug-in or specialized software capable of presenting the content **MUST** be freely available for all desktop platforms (i.e., Windows, Mac, and Linux and for tablets and smartphones).

Note: When a plug-in is not available for a particular platform, a compatible plug-in or specialized software such as VLC, **MUST** be presented (e.g. [VLC](#) is an open source multimedia framework that will play most formats on any platform and could be used as a substitute).

5.1.2 Indication of File Type and Size

All hyperlinks to content that require a plug-in or specialized software **MUST** be accompanied by a text indication of its file type and file size (e.g. [PDF document \[PDF 188 KB\]](#)).

5.1.3 Hyperlink to Source

A hyperlink to the source of relevant plug-in or specialized software **MUST** be provided from each page on which a plug-in or specialized software is needed to access the content.

5.2 Text

5.2.1 Format

All text-based content **MUST** be presented primarily as text in HTML.

Note: While all text-based content **MUST** be displayed as HTML, such content **MAY** additionally be developed in another format for viewing or printing with the use of plug-in software freely available for all platforms. An example of this type of format is Adobe's PDF, for which the Adobe PDF viewer, Adobe Reader, is available for all platforms. If the content is made available in another format (e.g. Adobe PDF), this document **SHOULD** contain metadata and language declaration

5.3 Still Images

All still-image graphics **MUST** be optimized and enhanced for the Web to reduce file size and download time:

Note: Images **MUST** be served in a way that minimizes the load (bandwidth and load time) on the user's system. Multiple image versions and resizing techniques should be employed so that the specifications of the image file match as closely as possible the purpose for which it is being requested.

Example: Image thumbnails should not simply be scaled-down versions of the full-sized file.

Note: Exemptions to this requirement may be granted by VMC in certain situations where the use of proprietary solutions is needed to meet project objectives.

5.4 Video/Animations/Moving Images

5.4.1 Format

Video files **MAY** be uploaded and streamed from video-sharing websites from a user account created or existing from the institution.

Note: If the video is hosted on the exhibition site, the video files **MUST** be available in variable format sources (e.g., MP4, WebM formats) within the video element in order to be supported by various browser agents. Adobe Flash format **MUST NOT** be used.

5.4.2 Video Player

Video files that are loaded into a browser-embedded player **MUST NOT** start automatically, and the player **MUST** include controls for starting, stopping and replaying the video.

5.4.3 Indication of Duration

The video files that are loaded in an integrated browser video player **MUST** be accompanied by a contextual indication of the duration of the video clip

5.4.4 Advertising

Advertising **MUST NOT** appear with any video clip.

5.4.5 Notice

A notice **MUST** be presented to visitors whose browser does not support the required file or format, such as MP4 or the plugin. The notice **MUST** provide a link to download the plug-in and **MUST** provide a link to the transcript.

5.5 Audio/Sound

5.5.1 Format

Audio files **MUST** be available in variable source formats (e.g., MP3, Wav, Ogg) within the audio element in order to be supported by various browsers, including mobile browsers. For more information about audio formats and browser support, see this [HTML5 audio article](#).

5.5.2 Streaming Audio

If an audio file is prepared for delivery via streaming, it **MUST** be adaptive so that the quality of the audio stream is adjusted in real-time based on the user's bandwidth.

5.5.3 Audio Player

Audio files that are loaded into a browser-embedded player **MUST NOT** start automatically, and the player **MUST** include controls for starting and stopping the audio.

5.5.4 Non-Streaming Audio

Non-streaming audio files that are loaded into a browser-embedded player **MUST** be accompanied by a direct hyperlink to the audio file itself, enabling users to access it without having to rely on the browser- embedded player. This requirement does **NOT** apply to the version optimized for mobile.

5.5.5 Indication of Duration and Size for Streamed Audio

All hyperlinks to streamed audio files **MUST** be accompanied by a text indication of the streamed file's duration and the file's size.

5.5.6 Notice

A notice **MUST** be presented to visitors who do not support the required plug-in or format such as MP3. The notice **MUST** provide a link to download the plug-in and **MUST** provide a link to the transcript.

5.5.7 Advertising

Advertising **MUST NOT** appear with **any** audio clip.

6. Web Analytics and Metadata

6.1 Web Analytics

Every product page **MUST** include additional code to enable the collection of visitor statistics for the product.

Note: VMC will provide directions for the implementation of the analytics code to enable the collection of visitor statistics.

6.2 Metadata

6.2.1 Required Metadata Elements

The following required metadata elements **MUST** be embedded in the HTML code of the page:

- Meta Description
- DC Element "title"
- DC Element "creator"
- DC Element "subject"
- DC Element "issued"
- DC Element "modified"
- DC Element "language"

6.2.2 Meta Description

Meta Description **MUST** appear in the "head" section (metadata block) of every unilingual home, landmark and section pages of the exhibit.

The meta description element contains one or more meaningful and keyword-rich sentences describing the product's content as a whole. The meta description often appears as a description in search engine results, so it **MUST** be unique to the page in order to be helpful to users in determining the page's content.

The meta description **SHOULD** be around 170 characters long but **MUST NOT** exceed 200 characters, including spaces.

Meta description on unilingual pages: Metadata **MUST** be in the language of the page. Syntax should be as follows:

```
<meta name="description" content="A virtual exhibit about mountaineers. Learn how mountain climbers were drawn to explore, map, enjoy, and fight to conserve peaks and wilderness areas in south-western British Columbia." />
```

Meta description on bilingual pages: Both French and English metadata **MUST** be entered in the same element. Enter the French description first, followed by the English description, separated by a pipe character (|).

Syntax should be as follows:

```
<meta name="description" content="Page d'accueil bilingue qui permet d'accéder au Musée virtuel du Canada dans la langue de son choix. | Bilingual splash page that provides access to the Virtual Museum of Canada in the language of your choice." />
```

6.3 DC Metadata Elements

The following six “Dublin Core” (DC) Elements (DC Title, DC Creator, DC Subject, DC Issued, DC Modified, and DC Language) **MUST** be created following the [Dublin Core Metadata Element Set, Version 1.1](#).

The following six elements **MUST** be included within the metadata block on the following pages:

- the product’s unilingual home pages;
- the main page for every major section of the product, and
- pages featuring resources for which there is sufficient context and meaning and which are worth listing in a search engine.

6.3.1 DC Element “title”

The DC Title element contains the exact title as it appears on the page, e.g. “Doctors in the North”. For sub-pages of a resource, enter the title of the subpage only (not the section heading).

DC title on unilingual pages: Metadata **MUST** be in the language of the page. Syntax **MUST** be as follows:

```
<meta name="DC.title" content="Doctors in the North" />
```

DC title on bilingual pages: Create one DC title element containing the French title, and a second DC title element containing the English title.

Syntax **MUST** be as follows:

```
<meta name="DC.title" content="Musée virtuel du Canada" /><meta name="DC.title" content="Virtual Museum of Canada" />
```

6.3.2 DC Element “creator”

The DC creator element contains the name of the person or organization that was responsible for the creation of the content of the exhibit.

Separate subdivisions of the organization name using commas. Separate multiple organization names using semicolons (if more than one organization created the resource).

DC creator on unilingual pages: Metadata **MUST** be in the language of the page.

Syntax **MUST** be as follows:

```
<meta name="DC.creator" content="Vancouver Art Gallery; Royal  
British Columbia Museum" />
```

DC creator on bilingual pages: Create one DC creator element containing the French creator name, and a second DC creator element containing the English creator name (if there are different language versions of the name).

Syntax **MUST** be as follows:

```
<meta name="DC.creator" content="Musée canadien de l'histoire" />  
<meta name="DC.creator" content="Canadian Museum of History" />
```

6.3.3 DC Element “subject”

The DC subject element identifies the topic of the resource, using terms selected from the Government of Canada Core Subject Thesaurus.

Select one or more values from the Government of Canada Core Subject Thesaurus. Be as specific as possible. The thesaurus can be consulted at:

<http://www.thesaurus.gc.ca/recherche-search/thes-eng.html>

<http://www.thesaurus.gc.ca/recherche-search/thes-fra.html>

DC subject on unilingual pages: Metadata **MUST** be in the language of the page. Syntax **MUST** be as follows, including the title for the encoding scheme (gcore):

```
<meta name="DC.subject" title="gcore" content="Archaeology; Art  
galleries" />
```

DC subject on bilingual pages: Create one DC subject element containing the French subject terms, and a second DC subject element containing the English subject terms.

Syntax **MUST** be as follows, including the title for the encoding scheme (gcore):

```
<meta name="DC.subject" title="gcore" content="Exposition  
virtuelle; Collection numérique; Site Web" />  
<meta name="DC.subject" title="gcore" content="Virtual exhibitions;  
Digital collections; Websites" />
```

6.3.4 DC Element “issued”

The DC issued element identifies the date the resource was first published to the Web. It never changes.

Enter a single date, in format YYYY-MM-DD. If only the year and month are known, enter "01" for the day, e.g. 2012-04-01. If only the year is known, enter "01" for both the month and the day, e.g. 2012-01-01

Syntax **MUST** be as follows, including the title for the encoding scheme (W3CDTF):

```
<meta name="DC.issued" title="W3CDTF" content="2012-01-01" />
```

6.3.5 DC Element “modified”

The DC modified element identifies the date the resource was reposted to the Web following a substantial revision. This element **MAY** be left empty except in the case of substantial revision.

Enter a single date, in format YYYY-MM-DD. If only the year and month are known, enter "01" for the day, e.g. 2012-04-01. If only the year is known, enter "01" for both the month and the day, e.g. 2012-01-01

Syntax **MUST** be as follows, including the title for the encoding scheme (W3CDTF):

```
<meta name="DC.modified" title="W3CDTF" content="2012-01-01" />
```

6.3.6 DC Element “language”

The DC language element defines the language of the Web page being described. Enter a single three-letter language code from the encoding scheme ISO639-2/T:

For example, English=eng; French=fra

DC language on unilingual pages: Metadata **MUST** be in the language of the page. Syntax **MUST** be as follows, including the title for the encoding scheme (ISO639-2/T):

```
<meta name="DC.language" title="ISO639-2/T" content="fra" /> OR  
<meta name="DC.language" title="ISO639-2/T" content="eng" />
```

DC language on bilingual pages: Create one DC language element containing “fra”, and a second DC language element containing “eng”.

Syntax **MUST** be as follows, including the title for the encoding scheme (ISO639-2/T):

```
<meta name="DC.language" title="ISO639-2/T" content="fra" />  
<meta name="DC.language" title="ISO639-2/T" content="eng" />
```

D) Back-end

1. Response Time

Note: Products **SHOULD** load reasonably rapidly. A slow response time increases the bounce rate and decreases the average page views per visit.

Note: In the case of mobile devices, the response time **SHOULD** also be reasonable. In addition, the size of content and downloads, the number of calls to the server, as well as page refreshes **MUST** all be reduced as much as possible.

Note: The file sizes for all file types **MUST** be optimized. In particular, when producing the final image, audio and video files, settings must be used to optimize the file size down to something reasonable for web consumption for the type of media it is.

2. Password protection

During the development of a Virtual Exhibit, the site **MUST** be password protected so that the general public, nor any search engine crawlers can access the site. The password protection **MUST** be done at the server level rather than programmatically.