

**Technical Specifications for the Development of
Virtual Museum of Canada (VMC)
Medium and Large Investment Stream
Online Products**

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The Virtual Museum of Canada (VMC) program's primary goal with respect to technical specifications is to ensure a rich and engaging experience no matter what device you are using (this includes traditional desktop browsers, tablets, smartphones but also screen readers, assistive technologies, web browsers with images, JavaScript, CSS disabled etc.). We try to achieve this by adhering to WCAG 2.1 AA standards as well as additional best practice recommendations from the VMC's technical team.

It is acceptable for a virtual exhibition to use emerging technologies or technologies that provide extended website functionality. However, these technologies must be compliant with WCAG 2.1 AA and the VMC's technical specifications. If an element is not compliant, the site should degrade gracefully if the user does not have the technology to support this element. Graceful degradation means that your Web site continues to operate even when viewed with less-than-optimal software in which advanced effects don't work. In cases where this is not possible, an alternate WCAG compliant version of the website should be created.

A) ACCESSIBILITY

These guidelines ensure that web content is accessible not only to those with traditional tools (such as a desktop computer and a web browser), but also to people with disabilities who may be accessing content using alternative methods, tools, and technologies.

1. The product must be PERCEIVABLE

Information and user interface components must be presentable to users in ways they can perceive. Online products **MUST** comply with all success criteria up to and including WCAG 2.1 Level AA, related to the perceivable principle. Full details and success criteria can be found [here](#). This includes but is not limited to:

- Text alternatives **MUST** be provided for any non-text content so that it can be changed into other needed forms, such as large print, braille, speech, symbols, or simpler language.
- Alternatives for time-based multimedia (such as video and audio) **MUST** be provided. For all audio and video, the following accessibility requirements are expected:
 - variable source file formats
 - should not start automatically (If they do, there must be a clear way to stop or dismiss it)
 - must have a transcript
 - must have closed captions where appropriate
 - must have controls at least for starting, pausing, stopping, re-starting and volume levels including mute
 - should have duration indicated on the page.
- The visual presentation of text and images of text **MUST** meet the minimum requirements for colour contrast as per the [W3C algorithm](#).

- Information, structure, and relationships should be conveyed through presentation and coded accordingly. When the sequence in which content is presented affects its meaning, a correct reading sequence should be in place.

2. The product must be OPERABLE

User interface components and navigation must be operable. Online products **MUST** comply with all success criteria up to and including WCAG 2.1 Level AA, related to the operable principle. Full details and success criteria can be found [here](#). This includes but is not limited to:

- All functionality **MUST** be keyboard accessible. This requirement includes video and audio controls, navigational aids, and the means to fill out online forms.
- Any keyboard operable user interface **MUST** have a mode of operation where the keyboard focus indicator is clearly visible and consistent from browser to browser. The default focus indicator built into browsers should not be relied upon.
- To help users navigate, find content, and determine where they are in virtual exhibits, add links and targets to bypass blocks of content and navigation 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.

3. The product must be UNDERSTANDABLE

User interface operation and information must be understandable. Online products **MUST** comply with all success criteria up to and including WCAG 2.1 Level AA, related to the understandable principle. Full details and success criteria can be found [here](#). This includes but is not limited to:

- Web pages **MUST** appear and operate in predictable ways by providing consistent navigation and identification. The site **MUST NOT** open multiple windows or pop-ups, create periodically auto-refreshing pages, or redirect pages automatically. When the state of the page changes, the URL must be adjusted so that each location is unique and identifiable.
- Semantic markup (<h1>, <h2>, , <abbr>, etc.) **MUST** only be used to convey meaning (for example, to convey the semantics) of content, rather than to add visual style to online products.
- Text **MUST** be readable and understandable. This is achieved by identifying the language the page is in, identifying text displayed in another language, and providing the expanded form or meaning of abbreviation/acronyms. **Note:** This is a WCAG 2.1 Level AAA item that the VMC is including.
- Web pages **MUST** appear and operate in predictable ways by providing consistent navigation and identification. Examples: 1- On mobile devices, the site **MUST NOT** open multiple windows or pop-ups, create periodically auto-refreshing pages, or redirect pages automatically.
- Form fields **MUST** have clear labels and instructions. Mechanisms **MUST** be put in place to ensure error prevention, identification and suggestion for recovery and correction.

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. Online products **MUST** comply with all success criteria up to and including WCAG 2.1 Level AA, related to the robust principle. Full details and success criteria can be found [here](#). This includes but is not limited to:

- Online products **MUST** be compatible with current platforms and browsers, including assistive technologies. The site **MUST** be tested on Mac, Windows, iOS and Android using Chrome, Firefox, Edge (Windows only) and Safari (on Mac and iOS only).
- To maximize compatibility with current and future user agents, mark-up elements **MUST** have complete start and end tags **MUST** be nested according to their specifications, **MUST** not contain duplicate attributes, and any IDs **MUST** be unique, except where the specifications allow these features. This can be validated using the W3 validator at: validator.w3.org.

B) BEST PRACTICES

The VMC expects all online products to be produced to the highest level of current web development standards and best practices. This includes the choices of technologies, programming languages, platforms, frameworks and coding techniques.

The following sections detail specific technical best practices that are required for all online products.

1. Responsive design

Online products **MUST** be programmed using responsive web design principles, meaning there is a single version of the product with a fluid presentation layer that adapts to any screen size.

A responsive web design approach includes:

- delivering site pages to all devices with the same URL and the same content, but not necessarily the same structure
- a fluid grid design concept
- flexible images
- media queries and breakpoints

Online products can be developed using responsive HTML/CSS frameworks or responsive themes within a content management system (CMS).

2. Progressive Enhancement

Technologies **MUST** be chosen to ensure that the online product's content will be available to the greatest number of visitors regardless of the technical configuration of their system or device and be available on all current browsers.

The core of every online product should be a base HTML version that presents all content in a simplified format that provides a basic level of user experience on all current browsers.

All techniques to enrich the user experience are encouraged and welcome, however they must all sit on top of the base HTML foundation, thus adhering to an approach of progressive enhancement and allow for graceful degradation.

The VMC's way of testing this is to explore the online product with CSS disabled and/or JavaScript disabled. The site should continue to operate with only the core HTML foundation.

3. Transport Layer Security (TLS)

Online products **SHOULD** use the Transport Layer Security (TLS) protocol throughout the site. Online products **MUST** use the TLS protocol when users are required to input a username and password.

Note: Permission **MUST** be obtained from the VMC for online products soliciting users for any personal information (name, address, email address, telephone number, credit card number, etc.) that will be stored by the product and kept for use by the institution responsible for the online product.

- It is not necessary to use TLS 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).

On pages using TLS, all hyperlinks to pages that do not use this protocol **MUST** use relative URLs once the user has sent a request to stop using TLS (for example, logout after opening a session).

4. Search Engine Optimization (SEO)

The online product **MUST** be developed in a way that maximizes the following:

- Search engine findability and crawlability of the product's homepage and inner pages
- Shareability of the product's homepage and inner pages on social media
- How well the product's homepage and inner pages display in search engine results pages
- Some mandatory elements to implement:
 - Every page **MUST** include a unique HTML page title
 - Meta description **MUST** appear in the head section all pages of the exhibit.

C) CONTENT ELEMENTS

The VMC requires that certain pages be included within online products and have consistent user interface and user experience features. The following are the VMC requirements for specific mandatory pages in your online product.

1. Copyright

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

2. Credits

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

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

English:

This online product was developed with the support of the Virtual Museum of Canada investment program. The Virtual Museum of Canada is managed by the Canadian Museum of History, with the financial support of the Government of Canada.

French :

Ce produit en ligne a été réalisé grâce au Programme d'investissement 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.

3. Feedback page

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

The feedback form **MUST** be organized in a logical order. Requirements for the form are as follows:

- The form **MUST** include 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.
- Forms **MUST** be accessible; that means, functional and understandable via keyboard only or keyboard accompanied with a screen reader agent.

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

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.

English VMC Privacy Policy URL: <http://www.virtualmuseum.ca/important-notice/>

French VMC Privacy Policy URL: <http://www.museevirtuel.ca/avis-importants/>

Users **MUST** be advised of the privacy issues associated with sending feedback through email as follows:

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. Sitemap

The online product **MUST** include a sitemap page for each language version (a hierarchically organized or nested list of hyperlinks to all major sections and pages of the product, at least two directory levels deep).

5. Homepage

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

6. VMC logo

Every online product page, including the Splash page, **MUST** display the appropriate VMC logo image in SVG format in the page's top right-hand corner, without any image border. Only language toggle links can be placed above the VMC logo. Items **MUST NOT** be found to the right of the VMC logo.

The 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 product versions optimized 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: ``
 - French: ``

- Logos for smartphones:

- English: ``
- French: ``

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 the VMC's approval.

7. Web analytics

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

Developing agency or institution **MUST** create a new Google Analytics account specific to the new site and grant the VMC permissions to "Read & Analyze" the site.

D) BACK-END

1. Response time

Online products **MUST** load reasonably quickly. A slow response time increases the bounce rate and decreases the average page views per visit.

Response time **MUST** also be reasonable for mobile devices. In addition, the size of content and downloads, the number of calls to the server, as well as page refreshes **MUST** be reduced as much as possible.

File sizes for all file types **MUST** be optimized. In particular, to produce the final image, audio and video files, settings must be used to optimize file size down to something reasonable for web consumption, given the media type.

2. Password protection

During online product development, the site **MUST** be password protected so that search engines and the general public cannot access the site. Password protection **MUST** be done at the server level, rather than programmatically.