



Digital Museums Canada Musées numériques Canada

CFP 2021 Technical Requirements

For the development of online projects in the Medium and Large investment streams

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<https://digitalmuseums.ca>



Table of Contents

A) ACCESSIBILITY	6
1. The product must be PERCEIVABLE	6
2. The product must be OPERABLE	7
3. The product must be UNDERSTANDABLE	8
4. The product must be ROBUST	9
B) BEST PRACTICES	11
1. Responsive Design	11
2. Progressive Enhancement	11
3. Transport Layer Security (TLS)	13
4. Search Engine Optimization (SEO)	13
C) CONTENT ELEMENTS	14
1. Home Page	14
2. Copyright	14
3. Credits Page	14
4. Feedback Form	15
5. Sitemap Page	16
6. Multilingual Support	17
7. DMC Logo	17
8. Web Analytics	18
D) BACK-END	19
1. Response Time	19
2. Password Protection	19



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.
- **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.



Purpose

The primary goal of the Digital Museums Canada (DMC) investment program with respect to technical requirements is to ensure a rich and engaging experience that is also barrier-free. Regardless of the user's capabilities and the platforms, devices or technologies used (implicit or explicit), a suitable experience is available. Online projects that follow these standards in their development and delivery are more resilient. This enhanced ability to uphold present and future technologies strengthens and extends the project's digital life and availability to users.

We are committed to:

- stay informed about and integrate best practices for making online content accessible
- work with other organizations to find accessible solutions for their projects
- support the use of web accessibility standards
- meet the AA compliance level of the World Wide Web Consortium's (W3C) Web Content Accessibility Guidelines 2.1 (WCAG 2.1)
- hold projects to as high a level of accessibility standards as can be achieved



We believe that:

- the website and projects **SHOULD** strive to offer a barrier-free experience for all users
- accessibility is the outcome of inclusive and thoughtful user experience design
- an accessible project will benefit all users regardless of their ability and the devices they use to access the content
- you don't need to reinvent the wheel, helpful resources are available

Note: It is strongly recommended that you share this document with your technical team and make sure they have a solid understanding of its contents before you embark on your online project. See our recommendations on [How to Choose a Web Development Team.^{\[1\]}](#)

A word about certain technologies

It is acceptable for online projects to use emerging technologies or technologies that provide extended website functionality. However, these technologies must be compliant with WCAG 2.1 AA and DMC technical requirements. If an element is not WCAG compliant, it **SHOULD** degrade gracefully while providing the user with explicit access to an equally effective alternate version. Graceful degradation means that your site continues to operate even when viewed with less-than-optimal software in which advanced features don't work.



A) ACCESSIBILITY

1. The product must be PERCEIVABLE

Information and user interface components **MUST** be presentable to users in ways they can perceive. Online projects **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.](#)^[2]

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 [WCAG's 1.4.3 Contrast \(Minimum\) success criterion](#).^[3]
- 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 projects **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](#).^[4]

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 online projects, 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 projects **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.](#)^[5]

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.



- 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 DMC is including.

- Web pages **MUST** appear and operate in predictable ways by providing consistent navigation and identification. Examples: 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 form 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 projects **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.](#)^[6]

This includes but is not limited to:

- Projects **MUST** be compatible with Mac, Windows, iOS and Android.



- Projects **MUST** be identically functional and compatible on top market share iOS and Android phones dating back at least 2 years from present date.
- Projects **MUST** be mostly functional and compatible on top market share iOS and Android phones dating back 4 years or more from present date.
- Projects **MUST** be identically functional and compatible on top market share browsers (Chrome, Firefox, Safari, Edge) dating back at least 2 years from latest stable version.
- Projects **MUST** be mostly functional and compatible on top market share browsers (Chrome, Firefox, Safari, Edge) dating back 4 years from latest stable version.
- Screen reader comprehension **MUST** be tested using one of the most common screen reader and browser combinations: VoiceOver and Safari if on a Mac, and JAWS with Chrome or NVDA with Firefox if on Windows.
- To maximize compatibility with current and future user agents, markup elements **MUST** have start and end tags and **MUST** be nested according to their specifications. They **MUST NOT** contain duplicate attributes, and all IDs **MUST** be unique. These characteristics can be validated using the W3 validator at: <http://validator.w3.org/>.



B) BEST PRACTICES

The DMC expects that all online projects will be developed following current and longstanding 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 DMC-funded online projects.

1. Responsive Design

Online projects **MUST** be developed using responsive web design principles, meaning there is a single version of the project 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 with the same layout structure
- a fluid grid design concept
- flexible images
- media queries and breakpoints

2. Progressive Enhancement

Technologies **MUST** be chosen to ensure that the content of the online project is available to the greatest number of visitors regardless of technical, physical, or cognitive impairment.



The core of every online project **MUST** be a base HTML version that presents all content in a simplified format, providing a basic level of user experience in all browsers.

The goal and idea behind progressive enhancement, is that no matter what technology layer(s) are removed (WebGL, JavaScript, CSS), pages **MUST** remain comprehensible and functional, although to a lesser degree.

All techniques used to enrich the user experience are encouraged and welcomed. However, they **MUST** do so unobtrusively. Unobtrusive JavaScript is the process or principle of JavaScript being used to complement and enhance the base HTML layer. It's the notion that using JavaScript **MUST NOT** be at the subjugation or dismissal of the underlying HTML and CSS layers.

By implementing unobtrusive scripting and progressive enhancement patterns in the design of online projects, we're ensuring that the components, pages, and entire sites degrade gracefully. Online project(s) will age less quickly when they conform to old and new technologies, assistive technologies, and various other miscellaneous criteria. There are a multitude of intrinsic and extrinsic factors that alter a user's experience, the only sustainable way to accommodate them is to build in a progressively enhanced manner.

In practice: Think about how best to represent information without JavaScript, using only CSS. Then think about it without the presentation layer (CSS), focusing only on semantic HTML.



3. Transport Layer Security (TLS)

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

Permission **MUST** be obtained from the DMC for online projects soliciting users for any personal information (name, address, email address, etc.) that will be stored by the project and kept for use by the organization responsible for the online project.

- 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)

Online projects **MUST** be developed in a way that maximizes the following:

- Search engine findability and crawlability of the project's main pages
- Shareability of the project's main pages on social media
- How well the project's main pages display in search engine results pages
- Every page **MUST** include a unique HTML document title and meta description



C) CONTENT ELEMENTS

DMC requires online projects to include certain content and features. Certain content **MUST** be represented in a manner consistent with these requirements, which are as follows:

1. Home Page

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

2. Copyright

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

3. Credits Page

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



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

English

This online project was developed with the support of the Digital Museums Canada investment program. Digital Museums Canada is managed by the Canadian Museum of History, with the financial support of the Government of Canada.

French

Ce projet en ligne a été réalisé grâce au programme d'investissement Musées numériques Canada. Musées numériques Canada est administré par le Musée canadien de l'histoire avec le soutien financier du gouvernement du Canada.

4. Feedback Form

Online projects **MUST** include a simple **HTML** feedback form in each respective official language. The feedback form **MUST** be configured to send an email to the organization responsible for the project.

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.

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.

5. Sitemap Page

Online projects **MUST** include a sitemap page for each language version. That is, a hierarchically organized or nested list of links to all major sections and pages of your project, at least two directory levels deep.



6. Multilingual Support

Online projects **MUST** be developed in Canada's two official languages, English and French and adhere to the following criteria:

- All content **MUST** be translated and available in both languages
- All project pages **MUST** have distinct URLs in each respective language
- It is **NOT** sufficient to merely link to the opposing language's home page
- Each page **MUST** have a language toggle link
- Selecting the language toggle **MUST** return the same page and content but in the opposing language

7. DMC Logo

Every page **MUST** distinctively include the DMC logo. The logo **MUST** appear in the top right-hand corner of each page with adequate considerations made so that it is distinct (visually and programmatically) from other elements surrounding it. Any alternative to this requirement **MUST** be agreed upon by both parties.

The DMC will provide SVG copies of the DMC logo upon request. The DMC logo **MUST** be marked up semantically and **MUST** link back to the DMC site. SVG format **MUST** be used for the web logo. The DMC logo **MUST** be implemented using the following HTML code:



English

```
<a href="https://www.digitalmuseums.ca"></a>
```

French

```
<a href="https://www.museenumeriques.ca"></a>
```

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

8. Web Analytics

Every page of the online project **MUST** include Google Analytics tracking code used to collect visitor data. For guidance and further details refer to Google's official [Set up data collection \(for websites\)](#)^[7].

The Analytics account **MUST** belong to the organization or developing agency and **MUST** have a property dedicated to the online project. A DMC user using the DMC provided email **MUST** be assigned to the site property and granted "Read and Analyze" access.



D) BACK-END

1. Response Time

Online projects **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 on 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 but **NOT** at the sacrifice of visibly degraded quality.

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.



REFERENCES

1. <https://www.digitalmuseums.ca/help-and-resources/toolbox/resources/choosing-your-web-development-team/>
2. <http://www.w3.org/TR/2008/REC-WCAG20-20081211/#perceivable>
3. <https://www.w3.org/TR/UNDERSTANDING-WCAG20/visual-audio-contrast-contrast.html>
4. <http://www.w3.org/TR/2008/REC-WCAG20-20081211/#operable>
5. <http://www.w3.org/TR/2008/REC-WCAG20-20081211/#understandable>
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7. <https://support.google.com/analytics/answer/9304153?hl=en#add-tag>