# Research Report Web accessibility of Canadian banking/financial services

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**Regroupement des aveugles et amblyopes du Québec**

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## BACKGROUND

### Project objectives

According to a 2019 Canadian Bankers Association survey, more than 75% of Canadians now use digital means (computers, tablets and telephones) to conduct most of their financial transactions, which is up from 68% in 2017.[[1]](#footnote-1) Therefore, the people running banking/financial institutions have every interest in developing the accessibility of their services for people living with disabilities.

It is easy to imagine the challenge that access to online banking/financial services can be for people living with disabilities. Simply paying bills, downloading monthly statements, sending Interac payments or even searching transactions can be major challenges. However, with the appropriate assistive technologies, people with disabilities can navigate and interact on the Internet more easily when websites meet certain accessibility standards. However, although the Web Content Accessibility Guidelines (WCAG 2.0) have existed for more than 10 years, we see that the accessibility of online banking/financial services is still fraught with difficulties.

In this regard, our purpose for conducting this project is to experience, observe and report the limitations in using the online services of the main Canadian banking/financial institutions for people with visual, hearing, motor and cognitive disabilities. First of all, this report is intended to educate those in the banking/financial institutions on improving the accessibility of their information and transaction platforms so that they comply with internationally recognized standards for people with disabilities. Then, we propose recommendations on how to more adequately respond to those clients’ needs. Ultimately, we would like those improvements to be made to institutional websites so that people with disabilities can be more independent when they are making online transactions, such as paying bills, sending payments or searching transactions.

**Our study includes**

* An online service appreciation poll;[[2]](#footnote-2)
* Compliance verification using automated web accessibility testing tools (WAVE and AXE DevTools);
* An analysis of functional and appreciation testing by a group of testers with disabilities;[[3]](#footnote-3)
* A recommendation guide.

#### Obstacles by type of disability[[4]](#footnote-4)

To understand where accessibility issues can arise, it is helpful to have a basic understanding of a range of disabilities and their related barriers found in digital content.

Not all people with disabilities encounter barriers in digital content, and those with different types of disabilities encounter different types of barriers. For instance, people in wheelchairs may encounter no barriers at all in digital content. A person who is blind will experience different barriers from a person with low vision.[[5]](#footnote-5) Many of the barriers that people with disabilities encounter on the web are often found in electronic documents and multimedia. Different types of disabilities and some of their commonly associated barriers are described here.

#### People with visual disabilities

Blind people tend to face the most barriers in digital content given its visual nature.[[6]](#footnote-6) They will often use [screen readers](https://en.wikipedia.org/wiki/Screen_reader) to access their computers or other devices and [refreshable braille displays](https://en.wikipedia.org/wiki/Refreshable_braille_display) to convert text to braille.

Common barriers for this group include:

* Visual content that has no text alternative;
* Functional elements that cannot be controlled with a keyboard;
* Overly complex or excessive amounts of content;
* Inability to navigate efficiently within a page of content;
* Content that is not structured (i.e., missing proper headings);
* Inconsistent navigation;
* Time limits (insufficient time to complete tasks);
* Unexpected actions (e.g., redirection when an element receives focus);
* Multimedia without audio description.

On the other hand, people with low vision are often able to see digital content if it is magnified. They may use a [screen magnification](https://en.wikipedia.org/wiki/Screen_magnifier) program to increase the size and contrast of the content to make it more visible. They are less likely to use a screen reader than blind people, though in some cases they will. People with low vision may rely on the magnification or text customization features in their web browsers or word processors, or they may install other magnification or text reading software.

Common barriers for this group include:

* Content sized with non-resizable absolute measures;
* Inconsistent navigation;
* Images of text that degrade or pixelate when magnified;
* Low contrast (inability to distinguish text from background);
* Time limits (insufficient time to complete tasks);
* Unexpected actions (e.g., redirection when an element receives focus).

#### People with hearing disabilities

Deaf people tend to face barriers when audio content is presented without text-based alternatives, but they encounter relatively few barriers in digital content otherwise.

Common barriers for this group include:

* Audio without a transcript;
* Multimedia without captions or transcript;
* Lack of American Sign Language (ASL) or Quebec Sign Language (LSQ).

#### People with mobility disabilities

Mobility-related disabilities are quite varied. For example, one could be limited to a wheelchair for getting around and face no significant barriers in digital content. Those who have limited use of their hands or who have fine motor disabilities that limit their ability to target and click elements in digital content with a mouse pointer may not use a mouse at all. Instead, they might rely on keyboards or their voices to control movement (i.e., [speech recognition](https://en.wikipedia.org/wiki/Speech_recognition)) through digital content, along with [switches to control mouse clicks](https://en.wikipedia.org/wiki/Switch_access).

Common barriers for this group include:

* Clickable areas that are too small;
* Functional elements that cannot be controlled with a keyboard;
* Time limits (insufficient time to complete tasks).

#### ****People with cognitive disabilities****

Learning and cognitive-related disabilities can be as varied as mobility-related disabilities, perhaps more so. These disabilities can range from a mild reading-related disability to very severe cognitive disabilities that may result in limited use of language and difficulty processing complex information. For most of the disabilities in this range, there are some common barriers and others that only affect those with more severe cognitive disabilities.

Common barriers for this group include:

* Use of overly complex/advanced language;
* Inconsistent navigation;
* Overly complex or excessive amounts of content;
* Time limits (insufficient time to complete tasks);
* Unstructured content (no visible headings, sections, topics, etc.);
* Unexpected actions (e.g., redirection when an element receives focus).

#### For all other people…

While we generally think of barriers in terms of access for people with disabilities, there are some barriers that impact all types of users, though these are often thought of in terms of usability. Usability and accessibility go hand-in-hand. Adding accessibility features improves usability for others. Many people, including those who do not consider themselves to have a specific disability (such as those over the age of 50), may find themselves experiencing typical age-related loss of sight, hearing or cognitive ability. Those with varying levels of colour blindness may also fall into this group.

Some of these usability issues include:

Link text that does not describe the destination or function of the link;

* Overly complex content;
* Inconsistent navigation;
* Low contrast;
* Unstructured content.

The above findings have made us ask yourselves why all these problems remain. Our study helped us to answer that partially and to educate the decision-makers and website development teams on the recurring problems with digital accessibility based on the four major principles of web accessibility. In essence, those principles are guidelines on interface actions and development to make them better adapted for people with disabilities.

### The four major principles of web accessibility

#### Principle 1: PERCEIVABILITY

Content and components of the user interface are presented so that they are easily recognized, perceived and interpreted. Users must be able to form a mental image of an interface’s composition, specifically, by using lists of headings (levels 1, 2 and 3), links, buttons, editing areas and meaningful descriptions for icons, images and form fields. Users must be able to perceive the big sections or areas of the page: banners, menus, main content, footers, etc.

#### Principle 2: OPERABILITY

By using the mouse or keyboard, users can easily manipulate the elements of the interface. Several options may also be offered to facilitate navigation and the orientation of and access to specific information: for example, a table of contents, content summary, signalling the steps in a process (1, 2 and 3 of 4), frequently asked questions section (FAQ), etc.

#### Principle 3: UNDERSTANDABILITY

The language and information structure of user interfaces are consistent. For example, titles and text content are in simple language, and the interaction with forms, dialogue boxes and other interactive components clearly presents what tasks that users are expected or required to do.

#### Principle 4: ROBUSTNESS

Whatever the environment (computer, tablet or telephone), the user experience must remain roughly the same. Robust interfaces can be interpreted reliably by a broad range of:

* computing devices (computers, tablets and telephones)
* browsers (Chrome, Firefox, Safari and Edge)
* assistive technologies (JAWS, NVDA, VoiceOver, ZoomText, etc.)

### Accessibility legislation

#### Federal legislation

Coming into effect on July 11, 2019, the *Accessible Canada Act* or *An Act to Ensure a Barrier-Free Canada* applies to organizations under federal jurisdiction, specifically, banks.[[7]](#footnote-7) This act includes the requirement that the concerned organizations prepare and publish accessibility plans for recognizing, eliminating and preventing barriers at several organizational levels (policies, programs, practices and services). Those accessibility plans must:

* Must be updated every three years (two years in Ontario);
* Include the consultation of people with disabilities;[[8]](#footnote-8)
* Have a way to receive and deal with feedback about their accessibility.

The Accessibility Commissioner can use a range of tools to ensure that organizations are meeting their obligations under the act, including:

* Inspections;
* Production orders (ordering an organization to provide records and reports);
* Compliance orders (ordering an organization to correct a violation and taking steps to ensure the contravention does not happen again);
* Notices of violation (notices setting out a warning or requiring an organization to pay a penalty of up to $250,000 per violation);
* Compliance agreements (when an organization agrees to correct a violation within set terms).

However, for the Accessibility Commissioner to use those tools, a complaint must first be filed. That complaint will have to demonstrate that people experienced physical or psychological harm, property damage or financial loss or were otherwise adversely affected. We point out here that the *Accessible Canada Act* is not very restrictive and that the route will be rather long for people trying to ensure that their fundamental right to accessibility is respected.

#### Provincial accessibility legislation

Although the *Accessible Canada Act* concerns all of the provinces and territories, some legislation was adopted well before 2019 intended to improve accessibility for people living with disabilities.

The *Accessibility for Ontarians with Disabilities Act, 2005* (AODA)[[9]](#footnote-9) includes a voluntary declaration mechanism ensuring some monitoring of accessibility compliance.[[10]](#footnote-10) That is done through various compliance education, encouragement and verification activities.

The last accessibility compliance and enforcement report dates back to 2017[[11]](#footnote-11) and includes interesting data on the actions being taken to reduce barriers and improve accessibility. Because banking/financial institutions are designated as public sector organizations, their administrators are obligated to file accessibility compliance reports every two years. Furthermore, considering the AODA provision stipulating that, “by January 1, 2021, all internet websites and web content must conform with WCAG 2.0 Level AA,”[[12]](#footnote-12) we hope that the members of the Government of Ontario are ready to publish a new compliance and enforcement report within two years following the coming into effect of the act, so no later than 2023. Since 2018, AODA administration has been the responsibility of the Minister for Seniors and Accessibility.

Furthermore, since AODA creation in 2005, people living with disabilities have reviewed the act three times and their comments collected on its efficiency: in 2010, 2014 and 2019. The reviewer of the 2019 report, the Honourable David C. Onley, gave us a rather gloomy retrospective on accessibility in Ontario since the act was adopted:

I remember well the days when the AODA was enacted in the spring of 2005. One of the main points in the exciting new law was that it set a deadline for achieving accessibility for people with disabilities–January 1, 2025. To me and many others in the disability community, that date seemed a long way off. Surely, we thought, we’ll easily get accessibility done in 20 years–and hopefully a lot sooner.

Alas, here we are almost 14 years later, and the promised accessible Ontario is nowhere in sight. The vision in the AODA has, by and large, turned out to be a mirage. Every day, in every community in Ontario, people with disabilities encounter formidable barriers to participation in the vast opportunities this province affords its residents–its able-bodied residents. . . .[[13]](#footnote-13)

Created in 2013, the *Accessibility for Manitobans Act*[[14]](#footnote-14)was intended to create five standards[[15]](#footnote-15) collaboratively with representatives from the community of people living with disabilities and public and private organizations. Only the accessibility standard for customer service is in effect now. The standards for employment, information and communication are currently being developed. In 2021, a report on the standard for customer service was produced.[[16]](#footnote-16)

In 2017, Nova Scotia became the third Canadian province to adopt an accessibility act,[[17]](#footnote-17) with the objective of accessibility by 2023. Following consultations, Government of Nova Scotia representatives announced the Access by Design 2030 strategy, which established a framework and priorities. The built environment and education standards were to be developed first, followed by standards on employment, goods and services, information/communication and transportation. Ostensibly, a review of the NS accessibility act was to begin in the fall of 2021 with its results expected for the summer of 2022.[[18]](#footnote-18)

In Quebec, although there is no specific law on accessibility, there is the *Act to secure handicapped persons in the exercise of their rights with a view to achieving social, school and workplace integration,[[19]](#footnote-19)* and, in 2011, the *Act respecting the governance and management of the information resources of public bodies and government enterprises* appeared.[[20]](#footnote-20)In the wake of the latter, Government of Quebec officials adopted three standards (SGQRI 008 1.0, 2.0 and 3.0) stipulating rules facilitating the accessibility of all websites, but only public organizations must comply with the standard stipulated in the act on the accessibility of downloadable documents (SGQRI 008 2.0).[[21]](#footnote-21)

### Accessibility policies of financial institutions

Most financial institutions have some kind of statement on their websites concerning their implemented efforts to promote and facilitate different aspects of universal accessibility.[[22]](#footnote-22) Specifically, that can include the accessibility of their buildings for people with reduced mobility, short stature and visual disabilities (access ramps, ATMs with vocal assistance, etc.); accessibility to employment and training; accessibility of information and documents. Representatives of the following financial institutions have released accessibility plans: BMO, CIBC, Desjardins, RBC, Scotiabank and Tangerine. Representatives from the following institutions have released more timid versions of standards, policies and information about the accessibility of their services: NBC, HSBC, TD, Manulife and Laurentian. Although the law requires banking/financial administrators to produce accessibility plans, it seems that the people running these five financial institutions have decided not to publicize them. For our purposes here, we will focus on policies that have to do specifically with the accessibility of online services (Internet and mobile).

When we review the information on those policies, we see that the importance given to the issue varies greatly among financial institutions. Some mention their efforts to comply with WCAG 2.0.[[23]](#footnote-23) Others refer to AODA directives on accessible websites and content. That decision to refer to the Ontario act is understandable considering that the head offices of several financial institutions are in Ontario, where AODA compliance has been mandatory since January 1, 2021.

The overall impression one gets from reading those policies is that several financial institutions do not seem to be sufficiently in keeping with the reality of accessibility issues. In some cases, the tenor of their statements on accessibility appears to indicate rather the language of façade rather than of real engagement to best serving people living with disabilities, but best practices have been observed and clearly show that the administrators of some banking/financial institutions seem to be more concerned about accessibility issues. Among those best practices, we can point out:

* The methodologies used to test accessibility;
* Efforts to comply with accessibility guidelines;
* Access to resources facilitating the use of online services;
* Access to accessible alternative formats;
* Access to human technical assistance.

## METHODOLOGY

To best understand the nature of the problems that people living with disabilities can face when using online banking/financial services, we used several data collection methods:

1. In August of 2021, we first sent out a call to participate in the study, and 29 people living with disabilities responded to that call. To select the candidates we would keep, approximately 20, as an essential criterion, we decided to try to prioritize the balance between the representativeness of disability conditions with regard to digital and financial literacy, disabilities, the variety of assistive technologies used and subscription to the service offers of banking/financial institutions. Then, between September and December of 2021, we conducted functional assessments[[24]](#footnote-24) with a group of 21 testers divided into three subgroups. Those tests were based on an analysis of navigation in routine transaction pages: bill payment, transfers (between accounts, between people or with Interac) and transaction searches.[[25]](#footnote-25) The tests took place in several hardware environments (computer, tablet and telephone) and software environments (operating systems: MAC, PC, IOS and Android; browsers: Chrome, Firefox, Safari and Edge; assistive technologies: JAWS, VoiceOver, TalkBack, ZoomText and braille reader).
2. We then made a public appeal on RAAQ and COPHAN social media asking people living with disabilities to take an appreciation poll on online banking/financial services. That poll allowed us to collect comments and suggestions from 65 respondents across Quebec. Distribution of results based on disability type: 94% (61/65) of respondents had a visual disability;[[26]](#footnote-26) 11% (7/65) had a hearing disability; 6% (4/65) had a motor disability; 3% (2/65) had a cognitive disability. Some respondents said that they had more than one type of disability.
3. Last, using automated web accessibility testing tools (WAVE and AXE DevTools), we conducted a series of compliance tests on the websites of the 10 banking/financial institutions in the study, followed by verifications of those tests by a qualified expert. The technical-compliance assessment helped us to discover solutions and explanations for the problems detected during the functional assessment.

### About our group of 21 testers

* The first subgroup of testers was formed of six people, five of whom are blind and one with low vision. They participated individually by recording, via Zoom video conferences, 15 two-hour sessions each. Under the supervision of an observer collecting comments as the accessibility problems arose, the testers had to first complete an account opening form but without finalizing the operation, which would have required a credit check and sending personal data. They also had to test the accessibility of various informational pages on paying bills, reporting a lost or stolen credit or debit card and a home insurance application.
* The second subgroup of testers was formed of 12 people, two of whom with motor disabilities, eight blind people and two with low vision. This subgroup agreed to conduct transactional tests from their own personal accounts. At first, the plan was to involve banking/financial personnel in the process of data collection for these tests. In fact, we wanted to obtain access to practice accounts that would have allowed our testers to verify transaction service accessibility. Unfortunately, due to security issues, no one from any of the institutions agreed to participate in the study. Therefore, we then had to adjust our data collection method for this part of the project. In fact, for security issues in the protection and confidentiality of personal data, it was impossible to document via videoconference or in person the tests conducted in the testers’ personal accounts. We then decided on an appreciation questionnaire provided to testers so that they could document four real transactions in their own accounts (bill payment, transfer, transaction search and personal profile modification). Each tester spent about 10 hours on this assessment work. The transcript of their comments is called APPENDIX 4 herein.
* The third subgroup was formed of three people with cognitive disabilities. It appeared to us to be more effective for the subgroup to organize meetings to share their experiences (three two-hour meetings) and identify the main problems they encountered when they were conducting transactions. To prepare for their participation in subgroup discussions, they also had to spend time between sessions exploring informational pages (twice for two hours each time).

Our research protocol was developed with an eye toward respecting the ethical aspects of conducting research with human beings. First of all, to preserve the identity and confidentiality of research data, the testers were not identified in the research results. However, they agreed that the data could be collected for analytical, distribution and publication purposes. An informed consent form allowed them to understand the nature of the project, what they would have to do, how the data would be collected and used, how they would be compensated, the voluntary nature of their participation and their right to withdraw from the study at any time if they felt the need to do so. Furthermore, in the context of the conducted tests, no personal data on the testers’ transactional activities was collected. Also, the research materials and the consent form the testers had to sign were to be archived confidentially for no more than 12 months following the end of the project.

### Monitoring committee

Throughout the project, a monitoring committee had an advisory role in project coordination, including the sharing of comments and suggestions that will facilitate the execution of inclusive user testing and recommendations intended to improve banking/financial service accessibility. That committee was formed of the following members:

* Antoine Perreault, RAAQ Director (<https://raaq.qc.ca>)
* René St-Pierre, RAAQ Project Coordinator
* Carole Giguère, RAAQ Board Chairperson
* Jean-Marie D’Amour, web accessibility expert
* Alix Lefebvre-Dugré, people first rights resource, FMPDAQ ([https://fmpdaq.ca](https://fmpdaq.ca/))
* Jérôme Plante, File Director, COPHAN[[27]](#footnote-27) ([https://cophan.org](https://cophan.org/))

## STUDY SCOPE AND LIMITS

Although we made sure we tested and documented the widest possible variety of situations in which accessibility problems could occur, we do not claim that this study is exhaustive. Our sampling was relatively limited, but we believe that the results we obtained clearly show the main barriers and difficulties that can be encountered when making online banking/financial transactions. We observed that the many occurrences of the observed problems inevitably ended up producing a saturation effect beyond which it was useless to use more testers than those we were already using for our research.

Although this study fairly broadly covers all of people’s disabilities (visual, hearing, motor and cognitive), most respondents were people who have visual disabilities. Both locally and internationally, we see that this group of people are the most committed to digital accessibility because they seem to be the most affected by the limitations of online services. Furthermore, the audiovisual content of banking/financial institution web interfaces is nearly non-existent, which limited our study for people with hearing disabilities. In the rare cases with sound content, transcripts were available, which minimally met expectations on the issue. However, we point out that those transcripts could surely be improved by removing the text and image animations from the screen. As for people with motor disabilities, knowing that our sampling would not mean meeting with people who can use their voices or switches to control web interfaces, our study did not allow us to identify their specific accessibility problems.

It is also important to mention that the tests took place in a group of very diverse hardware and software environments, that is, those of the remotely monitored testers. However, although we sometimes observed that the interfaces did not react in exactly the same way depending on whether it was a computer, tablet or telephone being used, we can say that, generally, banking/financial platforms are robust because they provide a relatively smooth and transparent experience on most of the technological devices used. The execution of the study did not allow us to systematically verify the variations and disparities in robustness among the various devices used for the same banking/financial institution platform.

Furthermore, our study did not focus on the accessibility of the customer service provided on banking/financial institution platforms. Here we are thinking of virtual assistants (chatbots) and traditional communication channels such as the telephone, contact forms (email) and message relay services (MRS).

## STUDY RESULTS

### Appreciation poll results[[28]](#footnote-28)

To extend the coverage of our study, we wanted to know what people living with disabilities are thinking about the accessibility of online banking/financial services. Betweenmid-December of 2021 and the end of January of 2022, we launched a call to participate in a poll, using RAAQ and COPHAN social media, which allowed us to:

* Identify the profile of our 65 respondents;
* Learn about their appreciation of online banking/financial services;[[29]](#footnote-29)
* Collect general and specific comments on those services.

#### Salient points

As for the profile of our respondents, the poll revealed that:

* Nearly 75% were 50 and older;
* Nearly 90% do business with a group of five banking/financial institutions;[[30]](#footnote-30)
* More than 85% use speech synthesis (text-to-speech) as an assistive technology;
* More than 30% have low income.

Notably, our poll taught us that:

* More than 40% have trouble finding information when they consult the website or mobile application of their banking/financial institutions;
* More than 25% have trouble paying a bill or making a transfer between accounts, between people or with Interac;
* More than 20% have trouble verifying their balances;
* More than 65% don’t use the FAQ;
* More than 60% don’t use the search region.

#### Respondents’ profile

**Age group** (65 respondents from 18 to 81 years of age)

Nearly 75% (48/65) of respondents were 50 and older*.*

**Geographic distribution**

Nearly 60% of the respondents live in the Montreal metropolitan area while the others are distributed among the following regions:

* Abitibi;
* Québec;
* Estrie;
* Bas-St-Laurent;
* Outaouais.

**Distribution by banking/financial institution** (97 accounts)

Nearly 90% of the respondents do business with five banking/financial institutions:

* Desjardins: 41 (42%);
* NBC: 19 (20%);
* RBC: 12 (12%);
* TD: 7 (7%);
* BMO: 7 (7%);
* Scotiabank: 4 (4%);
* Tangerine: 4 (4%);
* CIBC: 3 (3%).

**Distribution by disability type**

* 94% (61/65) said they have visual disabilities;[[31]](#footnote-31)
* 11% (7/65) said that they have hearing disabilities;
* 6% (4/65) said that they have motor disabilities;
* 3% (2/65) said that they have cognitive disabilities.

(Some said that they have more than one type of disability).

**Distribution by computing device**

60% of respondents use both computers and smart phones. In general, they use the telephone for routine transactions (paying bills, making transfers and consulting balances) while they use the computer more for more complex operations such as transaction searches or adding bill payees.

* Computer: 54 (81%);
* Smart phone: 39 (60%);
* Tablet: 10 (15%)

**Distribution by operating system** (61/65)

* PC: 86% (53/62);
* Mac: 11% (8/62)

**Distribution by assistive technology** (61/65)[[32]](#footnote-32)

* 85% (52/61) use text-to-speech;
  + 50% (31/61) use text-to-speech on a computer (Jaws: 34% (21/61); 13% (8/61) use ZoomText with text-to-speech; NVDA: 3% (2/61));
  + 35% (22/61) use text-to-speech on a telephone (VoiceOver);
* 20% (12/61) use a magnifier
  + ZoomText: 64% (8/12);
  + Windows Magnifier: 36% (4/12));
* 6% (4/65) use no assistive technology.

**Distribution by browser** (64/65)

More than 80% of respondents use Google Chrome or Safari:

* Google Chrome: 63% (41);
* Safari: 20% (13);
* Firefox: 8% (5);
* Edge: 8% (5).

**Government-funded assistive equipment**

* 60% (39/65) fund their assistive equipment themselves;
* 40% (26/65) are government funded.[[33]](#footnote-33)

**People with low income** (under $20,000 annually)

33% (22/67) of respondents receive low income.

**Transaction types conducted**

* Verifying balances: 94% (62/65);
* Paying bills: 88% (58/65);
* Transfers between accounts: 88% (58/65);
* Interac transfers: 74% (49/65);
* Transfers between people: 68% (45/65);
* Investments: 27% (18/65);
* Home insurance applications: 12% (8/65).

#### Appreciation of banking/financial services[[34]](#footnote-34)

**5. I have trouble paying bills (63/65).**

* 27% (17/63) somewhat or strongly agree;
* 49% (31/63) somewhat or strongly disagree.

**6. I have trouble transferring money to someone else, between** accounts or via Interac (63/65).

* 25% (16/63) somewhat or strongly agree;
* 46% (29/63) somewhat or strongly disagree.

**7. I have trouble checking the balance in my account (64/65).**

* 22% (14/64) somewhat or strongly agree;
* 67% (43/64) somewhat or strongly disagree.

**8. I have trouble finding particular information when I use my banking/financial institution’s website or mobile application (63/65).**

* 40% (25/63) somewhat or strongly agree;
* 33% (21/65) somewhat or strongly disagree.

**9. To find information on my banking/financial institution’s website, I use the FAQ (63/65).**

* 67% (42/63) I don’t use the FAQ;
* 13% (8/63) Yes, but I have trouble;
* 20% (13/63) Yes, sometimes or often.

**9.1. If you never use the FAQ, please tell us why (40/65).**

* 48% (19/40) No need to use it because the site is clear enough as it is;
* 28% (11/40) In the list of suggested questions, I can never find one that matches what I’m looking for;
* 25% (10/40) Other reasons: too complicated, didn’t know there was one, prefer to call and not useful for blind people).

**10. The headings and navigation in the menus in different sections of the website are sufficiently clear and explicit (59/65).**

* 53% (31/59) somewhat or strongly agree;
* 17% (10/59) somewhat or strongly disagree.

**11. To find information on my banking/financial institution’s website, I use the search region (often represented by a magnifying glass image), where I can ask a question (60/65).**

* 60% (36/60) I don’t use the search region;
* 40% (24/60) Yes, sometimes or often.

**11.1. If you never use the search region, please tell us why (34/65).**

* 56% (19/34) No need to use it because the site is clear enough as it is;
* 27% (9/34) When I use it, it often gives me results that have nothing to do with my question.

**12. When I haven’t been able to find information on the website, I’ve called customer service and finally gotten an answer to my question (60/65).**

* 68% (41/60) somewhat or strongly agree;
* 5% (3/60) somewhat or strongly disagree;
* 18% (11/60) I’ve never tried to reach customer service.

**13. When I haven’t been able to find information on the website, I’ve filled out the contact form or emailed customer service and then finally gotten an answer to my question (58/65).**

* 62% (36/58) I’ve never tried to use the form or email to contact customer service;
* 19% (11/58) somewhat or strongly agree;
* 10% (6/58) somewhat or strongly disagree.

#### General comments on problems encountered

Respondents’ comments describe the problematic situations they have experienced with online banking/financial services in different locations and at different times. Therefore, they do not concern specific problems but rather hindrances in the effective use of those services. Here is a non-exhaustive list of perception problems: lost focus on the screen, unlabelled or poorly labelled form fields, menus that are difficult to navigate, no feedback following an action, poor colour contrasts, too much informational content, too many links or other clickable regions and text that is difficult to understand.

#### Specific comments on improving banking/financial services

##### TECHNICAL ASPECTS

* The presentation of information in grids and tables should be minimized for mobile devices and tablets;
* When using the website, I often face barriers starting with the field to connect, which is why I use the application on iPhone or with the TelNat service;
* It would be a good idea to add step-by-step instructions;
* Provide a way to deactivate session timeout;
* I don’t get statements on braille paper, which would be good for verifying my accounts. The exact figures are difficult to take in when it’s only vocal.

##### TRAINING NEEDS

* For banking/financial institution management and staff, information on recognizing the disability of people living with visual or other disabilities;
* For assistive technology users, IT and adaptive information and communication technologies (ICT) refresher training;
* Access to a person who can help us when we need it;
* Technicians and customer service reps should have JAWS training so they can help us so we have trouble.

##### GENERAL ACCESSIBILITY

* Complying with universally recognized guidelines on adaptive software for those with visual or other disabilities;
* Updating accessibility standards;
* Conducting regular testing with adaptive technology users and paying them for the work.

### Informational testing results

In our informational platform testing, accessibility problems arose in various ways. Some of the problems we observed appeared to us to be more significant because users were confronted with, for example, situations in which they could no longer continue the process of opening an account, or their user experience became annoying and tedious due to too many barriers. Several testers said that those barriers exasperated them and would have led most of them to abandon the process of opening accounts, applying for insurance or searching for information if they had not committed to carrying out the testing for the project. A summary of these problems is found in the following section, and the banking/financial institutions concerned are identified more specifically in **APPENDIX 1**.

On the other hand, some problems appeared to be less hindering. In fact, although they interfered with navigation progress and were irritants limiting user experience quality, the testers said that they could still overcome them. Those problems are presented in the following section, and the banking/financial institutions concerned are identified more specifically in **APPENDIX 2**.

For both major and irritating barriers, we first reached a finding on the encountered problem and then suggest a solution. After each case are the accessibility principle and the guideline concerning it. A link to the most up-to-date version of the guideline in English provides a detailed explanation of the problem it is intended to solve and then some concrete examples for website developers and programmers.

Besides our testing intended to observe and analyze the accessibility problems that blind people most often encounter, discussions with a group of people with cognitive disabilities allowed us to come up with very relevant and complementary results. In fact, the members of that group agreed that website interfaces are sometimes overloaded and that it can also be difficult to get their bearings in the mass of information presented. In that regard, those perceptions are embodiments of both of the most frequently encountered problems with web interface interactions: cognitive overload[[35]](#footnote-35) and disorientation.[[36]](#footnote-36) Furthermore, the language and terminology used can sometimes be incomprehensible. In order to clear those barriers, we recommend the use of texts written in clear and simplified language. There are several resources on that subject, but we are suggesting the following two:

<https://www.canada.ca/en/treasury-board-secretariat/services/government-communications/canada-content-style-guide.html#toc6>

<https://www.ontario.ca/page/ontarioca-style-guide>

#### Major barriers

**Experimental case: an attempt to open an online account**

The context of opening an online account was created via a transactional process or tunnel requiring users to enter personal information to then be validated with a credit check. For security issues, we limited that experience to entering the information in the form up to the final step of consenting before sending the request. Here we present the major barriers encountered during that testing.

1. **Non-functional interactive component**

**Finding:** At the start of the process, after activating the OPEN AN ACCOUNT link, a dialogue box appeared, but the screen reader did not recognize it. Because the focus was not on that window, the screen reader could not scan it. It then became impossible to continue in the account opening process, automatically ending the experience. Note: to continue the experience, we activated the link via the list of screen reader links.

**Solution:** Once the modal window opens, it is necessary to focus on it without being able to leave it before making a selection from the proposed options. To see an example of a dialogue box meeting all accessibility criteria, you can consult the following pages:

<https://labo.raamm.org/lab/tests/modal/index.html> [French only]

<https://www.w3.org/TR/wai-aria-practices-1.1/#dialog_modal>

**Finding:** In the menu region at the top of the page when we passed over a menu item, for example, Credit card, a submenu presented several regions of clickable links (Discover our cards, Credit cards and Tools and resources). Although it is relatively easy to use that interactive component with the mouse, people with visual disabilities and those who cannot use a mouse cannot access that submenu.

**Solution:** Provide an accessible navigation method, for example, with accordions. To see an example of an accordion meeting all accessibility criteria, you can consult the following pages:

<https://labo.raamm.org/lab/tests/accordion/index.html> [French only]

<https://www.w3.org/TR/wai-aria-practices-1.1/#accordion>

**Applicable principle and guideline**

**Robust:** [Understanding Success Criterion 4.1.2: Name, Role, Value](#https://www.w3.org/WAI/WCAG21/Understanding/name-role-value.html)

1. **Insufficient time**

**Finding:** For three of the banking/financial institutions, the informational page preceding activation of the request to open an account informed our testers that we could open one online in under five to seven minutes. Although it seemed to us to not be much time, even for a sighted person, we saw that a timer of about 45 minutes automatically started when the Open an account button was activated, 45 minutes evidently enough time to perform the task according to banking/financial institution personnel. If our testers did not complete the form within that time, the session expired, and they were automatically ejected from the form. There is no other option to restart the procedure or get help. Users are only tersely told to try again later.

**Solution:** Instead of ejecting users after the time expires, it would be better to offer a dialogue box displaying an option to continue the task, for example, with a question such as, “Would you like more time to complete your request? YES/NO?” Customers with visual disabilities, based on the testing we conducted on that particular site, would need at least 60 to 75 minutes to complete the task.

**Applicable principle and guideline**

**Operable:** [Understanding Success Criterion 2.2.1: Timing Adjustable](#https://www.w3.org/WAI/WCAG21/Understanding/timing-adjustable)

1. **Inaccessible modal window/dialogue box**

**Finding:** Generally speaking, when a link or button activated a dialogue box (modal window), fairly frequently, the screen reader did not announce the opening of that window.  For someone who can see the screen, the appearance of that dialogue box is obvious, but blind people using screen readers or who only see a small part of the page because they are using enlargement software cannot get those visual clues.

**Solution:** To be accessible, a dialogue box must meet the five following conditions:

* When it appears, the focus must be moved to its heading.
* It must be identified as a dialogue box with a role indicating the function (role="dialog").
* All page content outside the box must be hidden for adaptive tools as it is visually.
* It must be possible to close the box with a button for that purpose or by hitting the escape (Esc) key.
* When it closes, the focus must return to the element that opened the box.

To see an example of a dialogue box (modal window) meeting all accessibility criteria, consult the following page:

<https://labo.raamm.org/lab/tests/modal/index.html> [French only]

**Applicable principle and guideline**

**Robust:** [Understanding Success Criterion 4.1.2: Name, Role, Value](#https://www.w3.org/WAI/WCAG21/Understanding/name-role-value.html)

1. **Poorly labelled/worded/associated form fields, buttons or links**

**Finding:** When navigating among form fields, if they are in compliance with accessibility guidelines, it is enough to use the tab key to move from one field to another. However, if the form field labels are not explicit, users can get confused about the information required in them. Furthermore, for the field to be read, its label must be a correctly associated with it. This problem also appears for buttons or links without explicit descriptions. A common example is the link "To learn more." If that link is not contextualized, users can ask themselves, "To learn more about what?"

**Solution:** Labels and descriptions need to be explicit and appropriate. Instead of the typical case of “To learn more,” indicate the subject relating to that button or link, for example, “To learn more about use conditions” or “To learn more about this promotional offer,” etc. Furthermore, each label must be correctly associated with the corresponding field in the HTML code.

**Applicable principles and guidelines**

**Perceivable:** [Understanding Success Criterion 1.3.1: Info and Relationships](#%20https://www.w3.org/WAI/WCAG21/Understanding/info-and-relationships%20)

**Operable:** [Understanding Success Criterion 2.4.6: Headings and Labels](#https://www.w3.org/WAI/WCAG21/Understanding/headings-and-labels%20%20)

1. **Lost focus after modifying a form section**

**Finding:** Depending on the banking/financial institution's website, the summary or validation page of the account opening form allows users to have a glance of all the completed fields with links allowing modification of form sections. In the examples we tested, we wanted to modify a section at the beginning of the form and then return to the summary. In several cases, it was impossible to return to the summary, forcing us to review all the other sections of the form before reaching the summary.The behaviours our testers encountered varied among sites, but lost focus remained a problematic issue.

**Solution:** After a modification is made, a mechanism should allow us to return to focusing on our starting point, the process summary.

**Applicable principle and guideline**

**Operable:** [Understanding Success Criterion 2.4.3: Focus Order](#%20https://www.w3.org/WAI/WCAG21/Understanding/focus-order%20)

1. **Unannounced external links**

**Finding:** Generally speaking, our testers found that links fairly frequently did not announce their opening contexts. The consequence of this for blind people is that they do not know if the links are internal or open in a new window or tab.

**Solution:** For each link, a message would have to be added indicating the expected result after activation, for example, “This link will open in a new window.”

**Applicable principle and guideline**

**Understandable:** [Understanding Success Criterion 3.2.2: On Input](#https://www.w3.org/WAI/WCAG21/Understanding/on-input%20)

1. **Inaccessible automatic text entry**

**Finding:** In the address field, the address list region is made up of an edit field with inaccessible autocompletion. In fact, our testers could only select an address from the list very difficultly with the keyboard. It was easier for them to enter the address manually.

**Solution:** An ARIA tag (only visible with screen readers) should suggest that users should add addresses by entering them manually. The message to that effect could be worded as follows: "If you are using a screen reader, we suggest entering addresses manually. The button for doing that is immediately below the list region."

**Applicable principles and guidelines**

**Operable:** [Understanding Success Criterion 2.1.1: Keyboard](#https://www.w3.org/WAI/WCAG21/Understanding/keyboard%20)

**Robust:** [Understanding Success Criterion 4.1.2: Name, Role, Value](#https://www.w3.org/WAI/WCAG21/Understanding/name-role-value.html)

1. **Non-textual content equivalents**

**Finding:** The examples our testers encountered concerned the unnecessary use of text equivalents for decorative images. The information contained in those text equivalents is superfluous, and it unnecessarily overloads thereading of the interface.

**Solution:** Avoid using text equivalents for images that only have a decorative purpose. Screen readers must also not display unnecessary messages despite the absence of programmed text equivalents.

**Applicable principle and guideline**

**Perceivable:** [Understanding Success Criterion 1.1.1: Non-text Content](#https://www.w3.org/WAI/WCAG21/Understanding/non-text-content%20)

1. **Translation gaps**

**Finding:** Despite the fact that French was the language tag, we frequently discovered that several passages contained in the webpages we analysed were not translated.

**Solution:** Conform to the page language by translating each element comprising the page without forgetting the image replacement text and all textual elements added specifically for screen readers and not visible on the screen.

**Applicable principle and guideline**

**Understandable:** [Understanding Success Criterion 3.1.2: Language of Parts](#https://www.w3.org/WAI/WCAG21/Understanding/language-of-parts)

1. **Hard to use slideshows**

**Finding:** On screen captures presented in slideshows, whether for bill payments or reporting a lost/stolen card, pulsing animations indicate where users have to click to proceed. Although those displays are technically accessible, they are difficult to use for blind people, and so they tend not to use them.

**Solution:** Because slideshows can be very effective for sighted people, an alternative viewing method could be provided, for example, a numbered list of all the steps in the bill payment process. Accordions are completely appropriate interactive components to present that type of explanation.

**Applicable principles and guidelines**

**Operable:** [Understanding Success Criterion 2.1.1: Keyboard](#https://www.w3.org/WAI/WCAG21/Understanding/keyboard%20)

#### Irritating barriers

1. **Lack of feedback between form sections**

**Finding:** At the bottom of each form section, a button allows users to go to the following section. Once activated, the interface goes to the following section, but users are not notified, leading them to believe that nothing has happened after a few seconds of waiting.

**Solution:** When the button is activated (NEXT or CONTINUE depending on the website), the interface should automatically display the heading of the new form section. Currently, to continue to read content, blind people can refresh the page (Jaws: Insert-Esc) or go back to the top of it (with the T key) to read the first heading the screen reader encounters. These are alternative solutions to which users should not be subjected.

**Applicable principle and guideline**

**Robust:** [Understanding Success Criterion 4.1.2: Name, Role, Value](#https://www.w3.org/WAI/WCAG21/Understanding/name-role-value.html)

1. **Erroneous attribution of language tags (Francophone users)**

**Finding:** The screen reader reads the page but with an Anglophone accent, which makes navigation irritating and even incomprehensible.

**Solution:** modify attribute from lang="en" to lang= "fr"

**Applicable principle and guideline**

**Understandable:** [Understanding Success Criterion 3.1.1: Language of Page](#https://www.w3.org/WAI/WCAG21/Understanding/language-of-page%20)

1. **Error detection**

**Finding:** Although it is not usually possible to enter the number for a non-calendar day (that is, numbers 32 and higher), in one particular case, we observed an incongruous validation in the year of birth field. We could put any year of birth starting with 1872 up to 18 years before the current year (in fact, minors must go to a branch to apply). In another case, we could put whatever year we wanted starting with 999, including a year after the current year.

**Solution:** Limit the range of plausible years.

To see an example of form validation meeting all accessibility criteria, you can consult the following pages:

<https://labo.raamm.org/lab/tests/formvalid/index.html> [French only]

<https://wet-boew.github.io/v4.0-ci/demos/formvalid/formvalid-en.html>

**Applicable principle and guideline**

**Understandable:** [Understanding Success Criterion 3.3.1: Error Identification](#https://www.w3.org/WAI/WCAG21/Understanding/error-identification%20)

1. **Inaccessible step indicator**

**Finding:** The left lateral banner presents the different sections of the form as a navigation region containing initially inactive buttons. That banner can be considered an interactive step indicator because each of the sections (steps) is identified there by a button that becomes clickable once a section is completed. Using that step indicator, sighted people can easily observe their progress in the form because, for each of the completed sections, a little coloured checkmark appears beside the button. On the other hand, blind people are not verbally notified of that progress.

**Solution:** For each step in the form, an ARIA tag only visible with screen readers could be added to inform users of the current step (Personal information: steps 1-5; Contact information: steps 2-5, etc.) and completed steps (Personal information: steps 1-5 five completed, etc.)

For an example of a step indicator meeting all accessibility criteria, you can consult the following page:

<https://designsystem.ontario.ca/fr/components/detail/step-indicator.html>

**Applicable principle and guideline**

**Operable:** [Understanding Success Criterion 2.4.6: Headings and Labels](#https://www.w3.org/WAI/WCAG21/Understanding/headings-and-labels%20%20)

1. **Instructions without navigation marker**

**Finding:** In the examples our testers reported, they received instructions to go to a location on the right side of the page, click on the button in the menu on the right or touch to manage their invoices. Several testers reported that that type of instruction did not allow them to find the location on the page.

**Solution:** Specify the name of the interactive component to be accessed, for example, “Click on the button, link or XYZ tab.” Users will then have a marker to activate the interactive component. Knowing that screen readers can display lists containing all of the links and buttons contained in the current page, specifying the interactive component to be accessed would permit users to access it quickly using those lists.

**Applicable principle and guideline**

**Perceivable:** [Understanding Success Criterion 1.3.3: Sensory Characteristics](#https://www.w3.org/WAI/WCAG21/Understanding/sensory-characteristics.html)

#### Transactional testing results

For security/personal information protection reasons, our transactional testing was conducted via a questionnaire for respondents[[37]](#footnote-37) in which we asked them to report, based on the four accessibility principles (perceivable, operable, understandable and robust), their experience during real transactions they conducted in their respective accounts. Considering that we could only validate those experiences through observation, we must take the respondents' integrity for granted and believe that their reports reflect situations they actually experienced.

Depending on the assistive technologies the respondents used (JAWS, VoiceOver, TalkBack and ZoomText), the testing results show recurring accessibility problems for the four banking/financial institutions on which we performed transactional testing (NBC, Desjardins, RBC and Tangerine).[[38]](#footnote-38)However, because the informational testing conducted on the 10 websites in the study revealed recurring problems throughout, to varying degrees, all their platforms, through extrapolation, we suggest that the problems discussed here would also be very likely to be found on other platforms we did not test. Therefore, the problems we present can be interpreted as recurring ones generally consistent with all banking/financial transactional platforms.

To identify the prevalence of the problems encountered, we decided to categorize the results based on the number of occurrences of accessibility guideline violations our testers reported.[[39]](#footnote-39) We were not surprised that the most frequently encountered problems were almost the same as those we observed during informational testing. Below is the list of guideline violations and the number of occurrences of each violation our testers reported. That categorization also provided a kind of action plan allowing us to prioritize the tasks to be accomplished to correct those problems and thereby help to improve interface accessibility.

To better understand the methodology surrounding our results, we suggest that the reader see the questionnaire provided to the testers (**APPENDIX 3**). The detailed results themselves are in **APPENDIX 4**. For each of the guidelines mentioned, we recommend that the reader consult the WCAG 2.1 reference page at https://www.w3.org/WAI/WCAG21/Understanding/

### Accessibility compliance testing results

Using two automated assessment tools (WAVE and Axe DevTools),[[40]](#footnote-40) for the 10 banking/financial institutions we studied, we tested six informational pages with similar functions[[41]](#footnote-41) on all those institutions’ sites:

* Home
* FAQ
* Contacting us
* Lost/stolen card
* Opening an account
* Fees and interest rates

We believed that it would be useful to use both assessment tools because each complements the other's capacity to detect errors, which contributes to producing a broader overall picture of accessibility problems. For example, WAVE is particularly suitable for detecting a lack of form and button labels and alternative text, while Axe DevTools very effectively detects problems with ARIA attributes or list formatting. Furthermore, Axe DevTools tends to report a significant number of contrast problems. It would be wise to verify each of the reported occurrences to distinguish between a poor contrast situation and a proven contrast problem.[[42]](#footnote-42)

Moreover, the two tools do not use the same vocabulary to characterize problems, but, so that the reader can refer to the statements as they are presented in both testing environments, we kept their respective wordings. For example, to qualify the level of attention to pay to problems, WAVE identifies errors and alerts, while Axe DevTools characterizes them instead using terms such as critical, serious, etc.

When we conducted our tests, our objective was not to come up with a comprehensive list of all accessibility problems but rather to identify the most commonly detected ones. To do that, especially to understand the issues and suggested solutions, we borrowed the technical position of the people at Axe DevTools, who present rich documentation facilitating the very concrete solution of accessibility problems. For each of the banking/financial institutions, the tables in **APPENDIX 5** display the number of occurrences of the identified problems in a detailed manner.

#### Interpretation of results

Although we were careful to test pages with similar functions, it would be unwise to compare the accessibility of those pages on the sole basis of the variety and number of detected errors. For example, they do not contain the same number of links, buttons, form fields or interactive components. Therefore, pages with more elements or more elaborate content will inevitably reveal more errors. If we wanted to be exact in that type of comparative exercise, we would have had to conduct compliance testing on all the content of a website and then compare, in the form of a ratio, the structure of the pages and the number of objects and interactive components they contain with the type and frequency of the detected errors. Unfortunately, the parameters of our study did not facilitate our commitment to such a precise and extended analysis.

However, despite the limitations of our study, we can report the major trends in commonly encountered errors. For example, most of the pages presented contrast problems, absent or redundant alternative text and empty or unlabelled buttons and links. Furthermore, the content of several pages seemed to be missing the adequate application of certain ARIA attributes, making them inaccessible to assistive technologies. Here is non-exhaustive summary of the main problems we encountered:

Of all 10 **Home** pagestested:

* 70% did not have sufficient colour contrast;
* 70% had redundant links;
* 50% had ID attributes that were not unique;
* 40% had unlabelled or empty buttons;
* 40% had no alternative text;
* 40% had very small text.

Of all 10 **FAQ** pagestested:

* 80% did not have sufficient colour contrast;
* 80% had redundant links;
* 40% had unlabelled or empty form fields;
* 40% had unlabelled or empty buttons;
* 40% had very small text;
* 30% used unauthorized ARIA attributes.

Of all 10 **Contacting us** pages tested:

* 80% did not have sufficient colour contrast;
* 80% had redundant links;
* 70% had ID attributes that were not unique;
* 50% had redundant links;
* 50% had unlabelled or empty form fields;
* 30% had unlabelled or empty buttons.

Of all 10 **Lost/stolen card** pages tested:

* 80% had redundant links;
* 60% did not have sufficient colour contrast;
* 50% had unlabelled or empty form fields;
* 40% had identifiers that were not unique;
* 40% had very small text;
* 30% had unlabelled or empty buttons.

Of all 10 **Opening an account** pages tested:

* 100% did not have sufficient colour contrast;
* 80% had redundant links;
* 40% had unlabelled or empty buttons;
* 40% had very small text;
* 40% had ID attributes that were not unique;
* 40% used unauthorized ARIA attributes.

Of all 10 **Fees and interest rates** pages tested:

* 90% did not have sufficient colour contrast;
* 70% had redundant links;
* 50% had unlabelled or empty buttons;
* 50% had ID attributes that were not unique;
* 50% had links or buttons with no perceivable text;
* 30% used unauthorized ARIA attributes.

We believe that our compliance testing generally allowed us to corroborate what was already observed during functional testing while giving us more precise indications on other problems more difficultly detectable by users, specifically, the inadequate usage of ARIA attributes, the absence of unique identifiers or incorrect list markers. In this regard, we believe that the tables presented in **APPENDIX 5** will be useful for development teams who want to be aware of specific accessibility problems on their own websites.

Furthermore, as opposed to the functional testing results, which are categorized according to the type of barrier encountered (major or irritating), the following list is of problems with regard to three of the four major accessibility principles covered by our compliance testing. We could not identify problems for the Understandable principle for the simple reason that the automated assessment tools do not provide that option. For each of the guidelines mentioned, we recommend consulting the WCAG 2.1 reference page at https://www.w3.org/WAI/WCAG21/Understanding/

Note: For readability purposes, we do not repeat the link to the explanation of the success criteria after its first mention.

#### Principle 1: PERCEIVABLE

**Images must have alternate text[[43]](#footnote-43)**

[Understanding Success Criterion 1.1.1: Non-text Content](#https://www.w3.org/WAI/WCAG21/Understanding/non-text-content%20)

**Finding:** Screen readers cannot translate an image into words to be read to users even if the image is only comprised of text.

**Solution:** Images must have short and descriptive alternative text so that screen reader users can clearly understand image content and objective.

**<li> elements must be contained in a <ul> or <ol>**[[44]](#footnote-44)

[Understanding Success Criterion 1.3.1: Info and Relationships](https://www.w3.org/WAI/WCAG21/Understanding/info-and-relationships)

**Finding:** Screen readers notify users when they access the list by indicating the number of elements contained in that list. If the list is not marked up hierarchically, listeners are not informed of its structure.

**Solution:** For a list to be valid, it must have both parent and child elements. The parent elements can be a group of <ul> or <ol> tags. Child elements must be stated within those tags with a <li> tag.

**Certain ARIA roles must be contained by particular parent elements**[[45]](#footnote-45) (Success Criterion (SC) 1.3.1)

**Finding 1:** For each role, WAI-ARIA explicitly defines which child and parent roles are authorized and/or required.

**Solution 1:** When it is necessary to convey context to assistive technology users in hierarchical form, the relationship information must be provided by using ARIA parent role elements.

**Finding 2:** For each role, WAI-ARIA explicitly defines which child and parent roles are authorized and/or required.

**Solution 2:** Make sure that the elements including explicit or implicit ARIA roles include the required child elements.

**Form <input> elements must have labels**[[46]](#footnote-46)

[Understanding Success Criterion 4.1.2: Name, Role, Value](https://www.w3.org/WAI/WCAG21/Understanding/name-role-value.html)

**Finding:** When field forms are unlabelled, screen reader users do not know what the expectations are for entering data and filling out fields. Furthermore, the lack of labels prevents fields from receiving focus when screen readers read them.

**Solution:** Associate by programming labels for all form controls. The recommended method in most cases is to use the <label> tag and an explicit association using for and id attributes.

**Text elements must have sufficient color contrast against the background**[[47]](#footnote-47)

[Understanding Success Criterion 1.4.3: Contrast (Minimum)](https://www.w3.org/WAI/WCAG21/Understanding/contrast-minimum)

**Finding:** Text with luminance too close to the background can be difficult to read because some blind and colour-blind people have trouble distinguishing contrast. In other words, everything tends to appear as having the same luminance, which makes it difficult to distinguish contours, borders, edges and details.

**Solution:** Make sure that all text and interface elements have sufficient colour contrast between foreground text and background colour. There must be a colour contrast of the least 4.5:1 for small text and 3:1 for large text and interface elements even if the text is part of an image. Large text has been defined in the requirements as 18 pt (24 CSS pixels) and 14 pt bold (19 CSS pixels).

#### Principle 2: OPERABLE

**Links must have discernible text**[[48]](#footnote-48)

[Understanding Success Criterion 2.4.4: Link Purpose (In Context)](https://www.w3.org/WAI/WCAG21/Understanding/link-purpose-in-context)

**Finding:** A link that does not receive programmed focus is inaccessible to screen reader users because they cannot know where the link goes. For example, events activated by the onmouseover type of focus are inaccessible to keyboard users.

**Solution:** Avoid using only Javascript events specific to the device such as onmouseover(), mouseover(), hover(), onmouseout() or mouseout().

Replace them with events independent from the device such as onfocus(), focus(), onblur() or blur(). Also avoid masking link text, for example, with display:none or aria-hidden="true".

**Ensure that links with the same accessible name serve a similar purpose**[[49]](#footnote-49)

[Understanding Success Criterion 2.4.9: Link Purpose](https://www.w3.org/WAI/WCAG21/Understanding/link-purpose-link-only)

**Finding:**  To ensure some navigation consistency, links with the same name should have the same description and destination. Links can be identified by their text but also out of context, for example, when the screen reader provides a list of all the links contained in a page.

**Solution:** ldentical links must describe the same objective to avoid any user confusion. The description allows users to distinguish links on the webpage that lead to other destinations and also helps them to determine if they must follow the link.

#### Principle 4: ROBUST

**IDs used in ARIA and labels must be unique**[[50]](#footnote-50)

[Understanding Success Criterion 4.1.1: Parsing](https://www.w3.org/WAI/WCAG21/Understanding/parsing)

**Finding:** Duplicate IDs are routine validation errors that can terminate label accessibility, for example, ARIA elements, form fields and table header cells. Unique identifiers differentiate each element. For accessibility purposes, client-side scripts process only the first instance of the ID.

**Solution:** Modify the duplicate ID value to make sure that each ID is unique. A way of testing the validity of HTML mark-up to quickly identify reused ID attribute values is to submit the code to the W3C validator at <http://validator.w3.org>.

**ID attribute value must be unique**[[51]](#footnote-51)(SC 4.1.1)

**Finding:** Active duplicate ID values terminate the accessibility of elements that can be selected, including form labels, table header cells, etc. Screen readers and client-side scripts ignore any duplication other than the first instance. When you reuse an active ID, generally the only one on which the script acts is the first instance of using that active ID.

**Solution:** Modify the duplicate ID value to make sure that each ID is unique. A way of testing the validity of HTML mark-up to quickly identify reused ID attribute values is to submit the code to the W3C validator at <http://validator.w3.org>.

**aria-hidden elements do not contain focusable elements**[[52]](#footnote-52)

[Understanding Success Criterion 4.1.2: Name, Role, Value](#https://www.w3.org/WAI/WCAG21/Understanding/name-role-value.html)

**Finding:** aria-hidden can be used to improve assistive technology user experience by masking a redundant or superfluous element, but it cannot mask interactive elements like links, buttons, etc.

**Solution:** If aria-hidden is used to mask the visible content of screen readers, identical or equivalent meaning and functionality must be exposed to assistive technologies.

**ID attribute value must be unique[[53]](#footnote-53)** (SC 4.1.1)

**Finding:** An active duplicate ID value terminates the accessibility of elements that can be selected, including form labels, table header cells, etc. Screen readers and client-side scripts ignore any duplication besides the first instance.

**Solution:** Rename all duplicate ID values. Validating HTML files helps to prevent and eliminate possible sources of accessibility problems when they do not terminate accessibility.

**ARIA attributes must conform to valid values**[[54]](#footnote-54)(SC 4.1.2)

**Finding:** ARIA attributes must be correctly spelled. Non-compliance with authorized values results in inaccessible content for assistive technology users.

**Solution:** Make sure that the value within each attribute is correctly spelled and corresponds with a valid value. For example, the checkbox role has only three possible values: true, false and mixed. Use of another value will stop the checkbox from being functional.

**Nested interactive controls are not announced by screen readers**[[55]](#footnote-55)(SC 4.1.2)

**Finding:** Screen readers do not announce elements that can be selected with an interactive control ancestor (any element that can accept user entries such as those with buttons and anchoring elements).

**Solution:** Make sure that interactive control elements do not have descendants that can be selected.

**Elements must only use allowed ARIA attributes**[[56]](#footnote-56)(SC 4.1.2)

**Finding:** Using ARIA attributes in unauthorized roles can interfere with webpage accessibility.

**Solution:** Use only authorized attributes for a given role including there where those attributes can be used.

**ARIA button, link, and menuitem must have an accessible name**[[57]](#footnote-57)(SC 4.1.2)

**Finding:** Screen reader users cannot detect the purpose of elements with role="link", role="button" or role="menuitem," which do not have accessible names.

**Solution:** Make sure that each element with role="link", role="button" or role="menuitem" has one of the following characteristics:

* Interior text perceivable by screen reader users;
* aria-label attribute not empty;
* aria-labelledby attribute pointing to an element with perceivable text.

**Buttons must have discernible text**[[58]](#footnote-58)(SC 4.1.2)

**Finding:** Screen reader users cannot detect the purpose of elements with role="link", role="button" or role="menuitem," which do not have accessible names.

**Solution:** Buttons must contain readable text clearly describing the destination, objective and function/action for screen reader users.

## RECOMMENDATION GUIDE

This recommendation guide is intended to be used to improve the accessibility of online banking/financial services. Our objective is to make sure that informational and transactional platforms not only comply with web accessibility standards, but that they also are easy and comfortable to use for all people with disabilities.

First of all, we believe that the four major principles of web accessibility (perceivable, operable, understandable and robust) are foundations or guidelines facilitating website design and development.[[59]](#footnote-59) Then, in the broader context of developing an accessible online service policy, we are recommending actions that can be taken to improve the accessibility of Canadian online banking/financial services.

### The four major principles of web accessibility

#### Principle 1: PERCEIVABLE

Content and components of the user interface are presented so that they are easily recognized, perceived and interpreted. Users must be able to form a mental image of an interface’s composition, specifically, by using lists of headings (levels 1, 2 and 3), links, buttons, editing areas and meaningful descriptions for icons, images and form fields. Users must be able to perceive the big sections or areas of the page: banners, menus, main content, footers, etc.

#### Principle 2: OPERABLE

By using the mouse or keyboard, users can easily manipulate the elements of the interface. Several options may also be offered to facilitate navigation and the orientation of and access to specific information: for example, a table of contents, content summary, signalling the steps in a process (1, 2 and 3 of 4), frequently asked questions section (FAQ), etc.

#### Principle 3: UNDERSTANDABLE

The language and information structure of user interfaces are consistent. For example, titles and text content are in simple language, and the interaction with forms, dialogue boxes and other interactive components clearly presents what tasks that users are expected or required to do.

#### Principle 4: ROBUST

Whatever the environment (computer, tablet or telephone), the user experience must remain roughly the same. Robust interfaces can be interpreted reliably by a broad range of:

* computing devices (computers, tablets and telephones)
* browsers (Chrome, Firefox, Safari and Edge)
* assistive technologies (JAWS, NVDA, VoiceOver, ZoomText, etc.)

### Our EIGHT RECOMMENDATIONS for improving web accessibility

The following recommendations are the result of analysing accessibility tests along with the discussions we have had, both with people living with disabilities and with web accessibility experts. For example, we have observed that the training of work teams assigned to web development seems to be insufficient because most banking/financial platforms contain rather trivial errors that would be very simple to correct. Here we are thinking about the choice of language for the page, poorly labelled fields and even a lack of textual equivalency for non-decorative images.

As for computer programming, we have also observed that some platforms use interactive components (menus, tabs, calendars, slide shows, etc.) not programmed for accessibility. In our opinion, this is often an issue of a choice to prioritize cosmetic appearance at the expense of functional performance. Furthermore, we see that, for some platforms, there is a lack of robustness in rendering webpages whether consulted using a computer, tablet or telephone. In our opinion, that situation stems from a lack of accessibility testing in those different environments.

Furthermore, we have noticed that, to meet the requirements of the *Accessible Canada Act*, the administrators of most banking/financial institutions do have accessibility policies, but their recurring accessibility problems show that there is some mismatch between words and concrete actions facilitating a reduction of barriers for people living with disabilities.

For a deeper understanding, we suggest that the Study Results section of this report be read, along with the appendices that detail the results of the informational, transactional and compliance testing conducted with people living with disabilities.

#### Recommendation 1

*That teams working on developing and maintaining websites are trained in web accessibility concepts, guidelines and techniques[[60]](#footnote-60)*

When websites and tools are well designed and coded, people with disabilities can use them, but many of the sites and tools currently being developed contain accessibility problems, which make them difficult or impossible to use for some people. Making the Internet more accessible would be a major benefit for users, businesses and society in general.

#### Recommendation 2

*That web designers and developers are qualified to properly use WAI-ARIA[[61]](#footnote-61)*

The Web Accessibility Initiative-Accessible Rich Internet Applications (WAI-ARIA) is a group of techniques facilitating the provision of users with information adaptation tools on the names, roles, conditions, properties and values of each interactive component.[[62]](#footnote-62) Due to the evolving and sometimes even fluctuating support of WAI-ARIA by various environments (combinations of browsers and screen readers), it is imperative to conduct functional testing in several environments. Furthermore, it is important to consider that adding WAI-ARIA attributes can turn out to be completely ineffective if they are not used at the right time and right place.[[63]](#footnote-63)

#### Recommendation 3

*That web designers and developers refer to practical examples of interactive components adequately coded for accessibility*

In this regard, we recommend three websites with concrete examples:

* The WAI-ARIA Authoring Practices 1.2 page of the W3C Group:

<https://www.w3.org/TR/wai-aria-practices-1.2/>

* The Components section of the Ontario Design System:

<https://designsystem.ontario.ca/components/detail/accordions.html>

* The Web Experience Toolkit Practical Examples section:

<https://wet-boew.github.io/wet-boew/demos/index-fr.html>

#### Recommendation 4

*That web designers and developers pay particular attention to mobile device accessibility[[64]](#footnote-64)*

People are accessing the Internet increasingly more frequently using a smart phone. The two major platforms with full-fledged accessibility tools are iOS: VoiceOver and Android: TalkBack. Because interactions with those devices are mainly via touch and not with a keyboard,[[65]](#footnote-65) it is just as important to consider web content accessibility on those platforms.

#### Recommendation 5

*That web designers and developers rely on the eight simple tips from the RAAMM Laboratoire de promotion de l’accessibilité du Web [[66]](#footnote-66)*

It is not always possible to make a website completely accessible in the short term because that can require major changes or even a complete overhaul. The people with the RAAMM lab suggest a few simple actions to improve accessibility quickly and inexpensively.

* **Colour contrast ratios :** Ensure sufficient colour contrasts using a downloadable tool free on the Internet.[[67]](#footnote-67)
* **Images with alt text :** Produce appropriate alt text in the webpage code for each image conveying a message and all images/links to know their destination.
* **JavaScript programming compatible with screen readers :** Be sure that JavaScript is compatible with screen readers by conducting tests verifying that all functionalities are operable with JavaScript.
* **Correctly labelled form fields :** Establish a direct relationship between label text and form control in webpage coding.
* **Logical heading structure :** Correctly code text display levels (Heading 1, Heading 2, etc.). Then screen readers and site crawlers will recognize headings, which will improve site ranking in Google.
* **Correctly identified links :** Be careful to create links making life easier for some users but also to increase the chances of site indexing in Google because site crawlers track significant words inside links.
* **Quick content access mechanism :** Provide a link to the main content as soon as a page opens. A level 1 heading placed at the start of the main content is another simple access method. These techniques facilitate the quick discovery of main content without having to go through all the navigation menus each time.
* **Identification of the main language of the page :** If the main language is incorrect, screen readers may read the displayed text in English with French syllabic stresses and intonation, which produces a disconcerting and unintelligible result. Therefore, the solution is to ensure appropriate language coding on each page of the website: for example, for the French section of the site, use the FR tag (instead of EN-US).

#### Recommendation 6

*That web platform accessibility be periodically assessed[[68]](#footnote-68)*

There are two crucial aspects to a complete assessment of web content accessibility: a functional assessment, with at least one screen reader, and a technical assessment. It is recommended that the functional assessment comes first, which puts assessors in the users’ shoes by detecting various problems, the causes of which the technical assessment will then explain. The inclusion of one or more people living with disabilities, such as people who are blind, on the work team also facilitates the discovery of problems that a sighted person, for example, would have trouble perceiving. For both occasional and regular evaluations, it is also necessary to conduct them with a variety of users.

Conducting a complete assessment of web content requires a great deal of time because there are numerous automated, semi-automated and manual verifications to be made. Because qualified experts must conduct this type of assessment, there is also the issue of significant cost, but it is generally enough to use a small representative sample of the pages to come up with an accurate picture of a website. On the other hand, an automated summary assessment and some manual verifications are often enough to get a general idea of the accessibility level.

#### Recommendation 7

*That banking/financial institution personnel develop tools facilitating the secure testing of their transactional interface accessibility*

People living with visual and or cognitive disabilities, especially people over 50, can be nervous about using transactional platforms because it involves entrusting machines with their personal data and money. We believe that making a secure environment available, for learning purposes, to assess the capacity of transactional interface support would encourage more people in this group to use those services.

#### Recommendation 8

*That banking/financial institution personnel publicize their web accessibility business cases[[69]](#footnote-69)*

Major returns on investments can be made and cover the cost of implementing web accessibility. To be ready to make that initial investment, the people running numerous organizations need to understand the social, technical, financial and legal/ political factors in web accessibility and its expected benefits.

* **The social factors** have to do with the equal opportunity that web accessibility gives people living with disabilities, but also with improving the experience of people without disabilities, including those using mobile devices, seniors, people with low literacy, people using older technologies and people who only use the Internet occasionally.
* **The technical factors** have to do with website interoperability, quality, reduced site development and maintenance time, reduced server load, offering content in different configurations and being ready to keep up with evolving web technologies.
* **The financial factors** have to do with the financial benefits of increasing website usage, savings, consideration of initial costs, costs during development and ways to reduce those costs by simultaneously developing web and mobile accessibility.
* **The legal and political factors** have to do with the web accessibility requirements of governments and other organizations in the form of regulations, policies, laws, standards, directives and other types of documents.

#### What else we can do

The data contained in this report clearly show that there are still many gaps in the accessibility of online banking/financial services. However, beyond our recommendations here, we believe that is useful to enhance our study with a few thoughts on what else we can do.

First of all, although there are international standards on accessibility (WCAG) and Canadian regulations intended to reduce barriers to accessibility,[[70]](#footnote-70) we do not have much control over their application and expected results. In fact, the *Accessible Canada Act* will only be constraining when the members of disability rights organizations and groups are successful in establishing, based on the harm caused to people living with disabilities, the provision of and interest in better accessibility to banking/financial services. Therefore, we have to continue to mobilize the stakeholders in this issue.

Moreover, the current provisions of the *Accessible Canada Act* do not concern the transactional aspects of websites, that is, when users are connected to their accounts, for example, to pay a bill or make a transfer. We believe that that situation creates serious harm toward people living with disabilities because it is exactly at the time one is making a transaction that the website should be fully accessible. We recommend that representations be made to expand the regulations of the *Accessible Canada Act* to cover the transactional aspect of websites.

Finally, we believe that the user experience of people living with disabilities would be greatly improved if web professionals were properly trained on the concepts, guidelines and techniques of web accessibility. First of all, that would happen with the continuous training of practising professionals and could be delivered at the collegiate level or through organizations such as the Académie de la transformation numérique au Québec[[71]](#footnote-71) or the AccessForward program supported by the government of Ontario.[[72]](#footnote-72) Ultimately, we believe that that training should lead to accreditation, ideally even a certificate demonstrating that the people trained are indeed qualified to intervene concretely in developing and applying web project standards. Furthermore, if we want to intervene upstream of the problem of web accessibility, the offer of basic training in collegiate and university institutions should include at least one 45-hour (3-credit) course on the subject.

## APPENDIX 1: Informational testing (major barriers)

\*Note to the reader: Because our testers are Francophones, we conducted our testing on the French versions of the banking/financial websites in our study. The structure of the webpages in both languages is generally the same, so we believe that both the French and English versions of those pages contain the same problems for the most part.\*

### Major barriers (concerned institutions)

1. **Non-functional interactive component**

**Targeted process:** request to open an account.

* **BNC**: <https://bit.ly/3zPx9Vv>
* **BMO**:<https://bit.ly/2W4nLgZ>
* **RBC**:<https://bit.ly/3FIPUM0>

For NBC, we encountered the same problems during an attempt to apply for a credit card. The screen reader could not access the dialogue box allowing us to progress in the request, automatically terminating the experience (<https://bit.ly/3FASIfr>).

**Targeted process:** looking for information on lost/stolen credit/debit card.

**CIBC**: <https://bit.ly/3pupybc>

1. **Insufficient time**

**Targeted process:** request to open an account.

* **NBC**:<https://bit.ly/3zPx9Vv>
* **BMO**:<https://bit.ly/2W4nLgZ>
* **RBC**:<https://bit.ly/3FIPUM0>

1. **Unannounced modal window/dialogue box**

We encountered this problem in various transactional processes, such as asking to open an account and applying for home insurance. We also encountered it in a section on paying bills.

* **NBC**: <https://bit.ly/3zPx9Vv>
* **TD**: <https://go.td.com/3uyRTAt>
* **Desjardins**: <https://bit.ly/3HxV8ej>
* **NBC**: <https://www.assurances-bnc.ca>
* **Scotiabank**: <https://bit.ly/3Ka5x1q>

1. **Poorly labelled/worded form field, button or link**

**Targeted process:** request to open an account.

* **NBC**: <https://bit.ly/3zPx9Vv>
* **BMO**:<https://bit.ly/2W4nLgZ>
* **HSBC**:<https://bit.ly/3GBEmdF>
* **Manulife**: <https://bit.ly/35aLaSD>
* **RBC**: <https://bit.ly/3FIPUM0>
* **TD**:<https://go.td.com/3B5hEcI>

**Targeted process:** applying for home insurance.

* **Desjardins**: <https://bit.ly/34FZ4fg>
* **NBC**: <https://www.assurances-bnc.ca>
* **RBC**: <https://bit.ly/3HJbQIq>
* **Scotiabank**: <https://bit.ly/3Ka5x1q>
* **TD**: <https://go.td.com/3uyRTAt>

1. **Lost focus after modifying a form section**

**Targeted process:** request to open an account.

* **NBC**: <https://bit.ly/3zPx9Vv>
* **Desjardins**: <https://bit.ly/3GuOjdC>
* **RBC**: <https://bit.ly/3FIPUM0>

1. **Lost focus after opening a modal window**

**Targeted process:** request to open an account.

* **TD**: <https://demande.td.com/eo/v2/#/mainApp/landing>

**Targeted process:** applying for home insurance.

* **Desjardins**: <https://bit.ly/34FZ4fg>
* **NBC**: <https://www.assurances-bnc.ca>
* **RBC**: <https://bit.ly/3HJbQIq>
* **Scotiabank**: <https://bit.ly/3Ka5x1q>

1. **Unannounced external links**

**Targeted process:** request to open an account.

* **BMO**: <https://bit.ly/2W4nLgZ>
* **Manulife**: <https://bit.ly/35aLaSD>

**Targeted process:** looking for information on paying bills.

* **NBC**: <https://bit.ly/3C31VeI>
* **Desjardins**: <https://bit.ly/3HxV8ej>

**Targeted process:** applying for home insurance.

* **Scotiabank**: <https://bit.ly/3Ka5x1q>
* **TD**: <https://go.td.com/3uyRTAt>

1. **Inaccessible automatic entry field**

**Targeted process:** request to open an account.

* **BMO**: <https://bit.ly/2W4nLgZ>
* **NBC**: <https://bit.ly/3zPx9Vv>

**Targeted process:** applying for home insurance.

* **TD**: <https://go.td.com/3uyRTAt>

1. **Non-textual content equivalents**

**Targeted process:** request to open an account.

* **RBC**: <https://bit.ly/3FIPUM0>
* **Desjardins**:<https://bit.ly/3GuOjdC>
* **HSBC**: <https://bit.ly/3GBEmdF>
* **TD**: <https://go.td.com/3B5hEcI>

**Targeted process:** looking for information on lost/stolen credit/debit card.

* **RBC**: <https://bit.ly/36VuPCf>
* **NBC**: <https://www.assurances-bnc.ca>

1. **Translation gaps**

**Targeted process:** request to open an account.

* **RBC**:<https://bit.ly/3FIPUM0>
* **Tangerine**: <https://bit.ly/3ou0QXZ>

**Targeted process:** looking for information on lost/stolen credit/debit card and on paying bills.

* **NBC**: <https://bit.ly/3C31VeI>
* **RBC**: <https://bit.ly/36VuPCf>
* **CIBC**: <https://bit.ly/3pupybc>

**Targeted process:** applying for home insurance.

* **TD**: <https://go.td.com/3uyRTAt>
* **NBC**: <https://www.assurances-bnc.ca>
* **RBC**: <https://bit.ly/35Lmi4j>
* **Scotiabank**: <https://bit.ly/3Ka5x1q>

1. **Hard to use slideshows**

**Targeted process:** looking for information on paying bills.

* **BMO**: <https://bit.ly/3ICAH13>
* **NBC**: <https://bit.ly/3C31VeI>
* **RBC**: <https://bit.ly/3psUetq>
* **Scotiabank**: <https://bit.ly/3tkt2ya>

**Targeted process:** looking for information on lost/stolen credit/debit card.

* **BMO**: <https://bit.ly/3iuJXs8>
* **NBC**: <https://bit.ly/3C33IjW>

## APPENDIX 2: Informational testing (irritating barriers)

### Irritating barriers (concerned institutions)

1. **Lack of feedback between form sections**

**Targeted process:** request to open an account.

* **BMO**: <https://bit.ly/2W4nLgZ>
* **NBC**: <https://bit.ly/3zPx9Vv>
* **Desjardins**: <https://bit.ly/3GuOjdC>

1. **Erroneous attribution of language tags (Francophone users)**

**Targeted process:** request to open an account.

* **BMO**: <https://bit.ly/2W4nLgZ>
* **NBC**: <https://bit.ly/3zPx9Vv>
* **Manulife**: <https://bit.ly/35aLaSD>
* **Scotiabank**: <https://bit.ly/3KpG6df>

1. **Error detection**

**Targeted process:** request to open an account or applying for home insurance.

* **Desjardins**: <https://bit.ly/3GuOjdC>
* **HSBC**: <https://dco-ao.hsbc.ca/chequing/advance/beforeYouStart>
* **RBC**: <https://bit.ly/3HJbQIq>

1. **Inaccessible step indicator**

**Targeted process:** request to open an account.

* **BMO**: <https://bit.ly/2W4nLgZ>
* **NBC**: <https://bit.ly/3zPx9Vv>

**Targeted process:** applying for home insurance.

* **TD**: <https://go.td.com/3uyRTAt>
* **NBC**: <https://www.assurances-bnc.ca>

1. **Instructions without navigation marker**

**Targeted process:** looking for information on paying bills.

* **RBC**: <https://bit.ly/3psUetq>
* **Desjardins**: <https://bit.ly/3HxV8ej>
* **Scotiabank**: <https://bit.ly/3IA4wiV>

1. **Inconsistent component identification**

**Targeted process:** looking for information on lost/stolen credit/debit card.

* **Desjardins**:<https://bit.ly/36VFd9C>

**Finding:** In this section of the site, users are presented with instructions to block and replace a credit card. We wonder what could have been the reason for the developers to provide two different presentation modes for similar functions. In the first case, that is, blocking the card, they decided on a tab presentation (tab 1: mobile app and tab 2: AccèsD Internet). In the second case, that is, replacing the card, they decided on a presentation limited to the display of two lists side by side (list 1: in the mobile app and list 2: in AccèsD Internet).

Generally speaking, tab navigation is an additional barrier for blind people. Furthermore, visual segmentation prioritizing a visual emphasis on the steps to follow (bigger size numbers) involves more action because you have to read the number and the instruction associated with it. Consequently, because the list at the first tab (mobile app) contains six elements, users have to press the down arrow key 12 times to reach it, while the list in the How to replace your credit card section only takes six actions, which is the exact number of elements that list contains.

**Solution:** Prioritize one navigation mode to limit the perception of inconsistency and disorientation. Furthermore, tab navigation is more difficult for blind people, so we suggest using simple lists like those displayed in the instructions for replacing the credit card.

* **TD**: <https://go.td.com/3oCgCAf>

**Finding:** In this example, we used a frequently asked question of the knowledge base: "What do I have to do if my card is stolen"? We noticed different complementary results with at least two users in two separate work environments depending on the browser used (Chrome or Safari). Although the answer to the question was the same for both browsers, the identification of those results was not. In fact, in Chrome, the identification was "Other relevant questions," and in Safari, it was "Related useful questions."

**Solution:** Provide the same results following a request regardless of user agent (browser or platform).

**Targeted process:** applying for home insurance.

* **TD**: <https://go.td.com/3uyRTAt>

## APPENDIX 3: Transactional testing (questionnaire)

### Accessibility analysis of your online banking/financial services

1. **General Information**

Your name:

Your banking/financial institution:

What interface do you use to access online banking/financial services? (Put an X beside the interfaces you use).

* Computer
* Tablet
* Telephone

**Note:** If you use more than one interface, explain how you use each of them. For example, "With the computer, I make the following transactions (list them here), while, with the phone, I do other transactions such as (list them here)." If that applies to you, explain when you prefer to use the computer and when the phone or tablet.

What assistive technology do you use? (JAWS, NVDA, VoiceOver, ZoomText, etc.)

How do you connect to your account? (identifier/password, facial recognition or touch recognition).

**2. What transactions do I have to make?**

We are asking you to make four transactions (or transactional processes) in your account and tell us how your experience was for each of them. The four transactions we we are asking you to make are as follows:

* Make a bill payment (examples: hydro, Bell, Rogers, credit card);
* Make a transfer between accounts or people or via Interac: if you are not ready to make a transfer between people or via Interac, just simply test and document a transfer between two of your accounts, for example, between your savings and checking accounts;
* Consult your transactions over the past 15 to 30 days;
* Make a modification to your personal profile, for example, your contact information, password, alert management, account access, etc.

**Note:** This exercise must be done in the normal context of your transactions and not create additional costs for you. If you have any doubts or questions about the transactions you can make for this exercise, please email René St-Pierre at [projet.accessibilite@raaq.qc.ca](mailto:projet.accessibilite@raaq.qc.ca).

**3. What are the steps to follow to document the tests?**

For each of the four tests, you have to break up the task into several steps. For example, when paying a bill, you have to:

1. select the transaction to be made (bill payment);
2. select a payee (hydro, Bell, Rogers, credit card, etc.);
3. choose the account from which you want to make the transaction;
4. enter the amount of money;
5. validate/accept the transaction;
6. make sure that the transaction was made (confirmation message).

For all four tests, pay particular attention to buttons, links, drop-down lists, tabs, windows, dialogue boxes and tooltips displaying alert messages or validation/confirmation requests. For each of the four tests, record your observations and comments. They may be positive when using the interface is simple and user-friendly, that is, easy to use, but your observations and comments must, above all, be made in a way that will help us identify the problems and difficulties encountered during navigation. Please feel free to tell us what you really think about your experience with the online services of your banking/financial institution.

**4. What is the best way to describe my experience?**To prepare you for producing your account of your experience, we suggest that you pay attention to the four major principles of web accessibility:

**Principle 1: PERCEIVABLE**

Webpage content and interface components must be presented so that they are easily recognized, perceived and interpreted. Users must be able to make a mental image of the composition of a webpage, specifically, by using heading lists (levels 1, 2 and 3), links, buttons, editing areas, signifying icon descriptors, images and form fields. Generally speaking, users must be able to perceive the major sections or regions of the page: banners, menus, main content, footers, etc.).

**Principle 2: OPERABLE**

With either the mouse or the keyboard, users must be able to easily manipulate interface elements. Several options can be provided to facilitate the navigation and orientation of and access to specific content, for example the table of contents, summary of contents, an indication of the steps in the process (step 3 of 4, for example), FAQ, etc.

**Principle: UNDERSTANDABLE**

To produce content that is easy to understand, developers must consider users' cultural and language differences, reading skills and cognitive disabilities as a whole. Uniform and consistent interfaces must be prioritized with regard to language and the structure of the information presented. As examples, text headings and content must be written in simple language, and interactions with forms, dialogue boxes and other interactive components must clearly present the the requirements expected of users or the tasks they must carry out.

**Principle 4: ROBUST**

Whether you test an interface on a computer, tablet or phone, the user experience should be roughly the same with regard to the above three principles. Therefore, robust websites can be equally reliably interpreted by a wide range of:

computing devices (smart phones, tablets and computers);

browsers (Chrome, Firefox, Safari and Edge);

assistive technologies (JAWS, NVDA, VoiceOver, ZoomText, etc.)

Furthermore, assistive technologies do not always interpret some interactive components correctly (dialogue boxes, tooltips, drop-down lists, accordions and tabs), thereby reducing the robustness of the site.

**5. What do I have to pay attention to during testing?**

Because our study is intended to identify accessibility problems and suggest solutions to reduce them, we are asking you to pay special attention to anything that can be a barrier to the effective use of online banking/financial services. To give you some guidance for making your comments and observations, remember the four major principles of web accessibility presented above. As a reminder, focus on:

* Headings or text that is not easily understandable;
* Links or buttons that do not produce results, that is, they don't tell you where to go or what action to take;
* Insufficient colour contrast that also reduces text readability;
* Form fields that seem useless or are difficult to complete;
* Tables with columns and rows that are difficult to read or interpret;
* Dialogue boxes displaying messages or instructions that are difficult to understand.

**6. Where do I record my testing results?**

Here below is where you have to record your testing results and observations. Use all the space you need to describe your discoveries for each of the four tests conducted:

* Results for bill payment test:
* Results for testing transfer between accounts, between people or via Interac:
* Results for verifying balance and transaction search test:
* Results for testing modification of your personal profile:

## APPENDIX 4: Transactional testing (detailed results)

**Legend**: The information between parentheses following the tested process (bill payment, transfer, etc.) corresponds with the tester's identifier (T1, T2, etc.) respectively, followed by the banking/financial institution and then the assistive technology used. The testers wrote the following answers.

**2.4.6 Headers and labels (22 occurrences)**

**Bill payment**

(T 1 – Desjardins - JAWS)

All identified buttons start with (open a dialogue box). When I activate the list of buttons, it's impossible to quickly find a button by typing the first letter of its name. It would be preferable to read ("To pay, open a dialogue box") for each button. I activate the button (to pay). (This experience occurred in the fall of 2021, and the problem has since been corrected).

I have to click on the name of the desired bill. I don't hear the name, and there's no indication (button or other) letting me know where I have to click.

(T2 - Desjardins - TalkBack)

In the application welcome interface, none of the buttons or menus are identified as such. The text-to-speech only says the name of the element but not whether it's a button or a menu. Those elements should be correctly identified so we know what type of elements they are before clicking. However, they do give the instruction to double tap to activate the element.

We shouldn't see the two images See bill details and Go to the next screen. The bill reference number or supplier name should be clearly identified as a button so that users know where to click to choose the supplier.

(T3 - NBC - ZoomText)

There's drop-down list in the frequency field. ZoomText tells me what’s in the field but not in the drop-down menu.

**Transfer**

(T1 - Desjardins - VoiceOver)

Select the originating account: that screen presents all the folios and their balances. I have to click on the originating fund folio, but nothing lets me know that element is clickable.

Next step: Toward. To get there, I have to click on (Go to next screen). It's an image. Once again, we need to be informed that the element is clickable.

(T2 - Desjardins - TalkBack)

In the application welcome screen, you have to swipe from left to right until the element comes up (Transfer) and then validate it. It's a menu there (contextual window) that isn't identified as such.

When I swipe from left to right in the window, I first see a button (Close) not identified as a button and then the start of the web view.

(T2 - Desjardins - TalkBack)

I have to swipe again to the right, and then I'm positioned on an image where TalkBack says (Activate the checkbox). I have to click on that image to activate it. That checkbox should be correctly labelled.  
**Transaction search**

(T2 - RBC - JAWS)

A help button allowing the accordion to be opened (Block the card) isn't correctly identified as a help button;

There's an untitled accordion (not labelled 0), so unlabelled;

A help button for transaction type is placed under the heading indicating the transaction type, but it isn't labelled, and there's no indication that it's for getting help.

(T4 - Desjardins - VoiceOver)

It would be preferable to modify the accounts label or control the account based on the displayed amount. My nine accounts start with (\*\*\*) and a group of numbers. I have to listen to the VoiceOver phrase to know the amount, which is a loss of productivity for me. Why not name a TFSA account "trip"? Then I'd know what my budget is for my trip to Mexico.  
 (T2 - Desjardins - TalkBack)

On the welcome screen, swipe from left to right to the element (My accounts), which is the first one in the menu (Quick access). You have to click on it to validate it. Then you're on an unworded label, in fact, an unlabelled button (Return).  
(T1 - Desjardins - VoiceOver)

You first have to determine the transaction type: deposits or withdrawals. I have to click on the element, but there are no clues letting me know it's clickable.  
(T4 - Tangerine - VoiceOver)

VoiceOver reads "tooltip" beside some elements to suggest a definition. For example, for a pending transaction, there's a tooltip on the side. When I click on it, it takes me to a description of what a pending transaction is. In my opinion, it isn't relevant to only hear the tooltip mentioned.

**Modification of personal profile**

(T2 - RBC - TalkBack)

There's an image at the start of the page that isn't correctly labelled. It has the name "summary small." It doesn't interfere with the proper use of the application but should have the name "summary."

(T2 - Desjardins - TalkBack)

Because I wanted to modify my contact information, I clicked on Profile and preferences. The focus was then on an unworded label, that is, a button (Return), which should be correctly labelled. Message heard: "no button label, outside list."  
(T5 - Desjardins - JAWS)

Button for changing contact information: for some reason, the exact message I hear and see in braille is "undefined change of contact info button."

* To add a phone number, in the form that opens, go down to Other number and enter the new number in the appropriate edit field; use the down arrow to get to cell phone because that's what I want to add. Tab to validate the button. *(Note: You have to be sure not to press the Add button and to just go to Validate. I made that mistake once. I think that it would be clearer if the button said: "Add another number.")*

(T1 - Desjardins - JAWS)

The button for modifying contact information is identified as the "undefined change of contact info button."

**2.4.3 Lost focus (10 occurrences)**

**Bill payment**

(T2 - Desjardins - TalkBack)

Most of the Desjardins application's pages work in web view, which causes numerous accessibility problems. In fact, I see that, when you get to a new page, TalkBack is still focused on the start of the web view, which generally corresponds with the start of the main page menu. You also have to remember that, at the end of the page, if you go past the last link on the page, the focus always goes back to the start of the page, and you have to restart your navigation. Also note that you can't find your focus when you click in the menu to validate an element, and you go back to the previous page.

(T2 - RBC - TalkBack)

Once you've indicated the bill to be paid, you're redirected to the next step, and your focus is once again on the Return button. So you have to go to the drop-down list again (From) to choose the originating account and validate. It would be better for the focus to be directly positioned in that location.  
(T2 - Desjardins - TalkBack)

Cancel-Validate: lost focus on the cancel button. You have to go back to the supplier summary.  
(T2 - Desjardins - TalkBack

Choose a frequency: once you've made your choice, the focus always returns to the start of the page. Therefore, you have to find your way by navigating from left to right in the screen to the Frequency field you've just completed.

**Transfer**

(T2 - RBC - TalkBack)

A text field allows you to send a message to the recipient. As for the amount, clicking OK brings the focus back. TalkBack doesn't mention the location of the focus when you close the keyboard. You know it only when you want to move. For the amount, the location of the focus is announced when you close the text field.(T2 - Desjardins - TalkBack)

When clicking on the image to check the box, the focus returns to the start of the window. You have to return by navigating to the right to that image, which now says, "Deactivate the checkbox" to understand that the box is indeed checked. That can create a lot of confusion.

**Transaction search**

(T4 - Desjardins - VoiceOver)

For my chequing account, it's complicated to use because you have to identify the date from a calendar after touching the Search button. Furthermore, it isn't very accessible because I lose the focus.(T2 - RBC - JAWS)

It's difficult to consult the details when you click on a transaction because the focus doesn't move where the details are at the end of all the transactions. However, when you close the accordion again, the focus returns to the right place.  
(T6 - RBC - VoiceOver)  
The focus isn't always right when the iPhone opens a new page after choosing a button.

**Modification of personal profile**

(T2 - RBC - TalkBack)

Locate the Next button at the bottom right of the keyboard and validate. Here as well, the focus moves to the next field (description, optional), but the label isn't announced.

**1.4.3 Contrast (minimum) (9 occurrences)**

**Bill payment**

(T3 - NBC – ZoomText)

There are two sections below the two previous fields, one to accept funds and the other to refuse them. I have to accept the funds, but the button for it is black on black.

(T7 - RBC - ZoomText)

By reducing the magnification, I get a better overall view, and this time, by clicking to choose my recipient, the list appeared visibly enough toward the bottom, the letters and figures white against black, very readable. However, when I position my cursor on Visa, the account name and number change colour to become letters and figures in black with a dark green background, so unreadable then. I can see better when it's white on black, so homogeneity (standards) for online colours would be preferable and simpler to see and navigate on the site. I can't differentiate white from yellow very well. Red is annoying and not very visible. Blue and green remain difficult to see, depending on their intensity.  
(T8 - Desjardins- ZoomText/ VoiceOver)

Please enter the security question to ask the recipient: that information isn't very identifiable, and only the field for entering the security question becomes perceptible after you select it with the mouse.

**Transfer**

(T8 - Desjardins - ZoomText)

After selecting the recipient, a dialogue box displays with information in a data table with the following columns: recipient's name, amount ($), frequency and date (DD/MM/YYYY). That information is easily visible except for the amount field, which is only perceptible after it's selected with the mouse. Furthermore, the drop-down list to select frequency isn't very very perceptible before it's selected.

**Modification of personal profile**

(T8 - Desjardins - ZoomText)

After selecting Manage alerts, a dialogue box allows you to register for the alert service by entering the email address where you want to receive them. The fields for entering information are barely visible. The Email address and Confirm email address fields become perceptible only after you select them with the mouse.

After activating the Validate button, a dialogue box appears, providing information on the alert management service and stipulating that the security code will be sent to that email address to activate the service. The checkbox with an identifier (I read and accepted the conditions for using the alert service in AccèsD) is barely visible but more perceptible after using the mouse to check the box.

In the bottom third at the bottom of that dialogue box, there are three buttons (Confirm, Correct and Cancel), which are easily visible. After activating the Confirm button, a new dialogue box appears with information for finalizing the registration. That information is barely visible, especially the field for entering the security code, which is only perceptible after using the mouse to select it.

Below that information, there's a checkbox with a warning/notice [translation]: "I confirm that I have verified the information on adding this alert and acknowledge that Desjardins is not responsible for any loss I could incur if, despite the alerts sent to me, I do not take the required measures in a timely manner." However, the checkbox is barely perceptible.

(T9 – Desjardins - ZoomText)

The table could have darker borders. Furthermore, the arrow to the right of each name is nearly invisible and so could be bigger and darker.

**1.3.1 Information and relationships (8 occurrences)**

**Bill payment**

(T1 – Desjardins - JAWS)

First column: name of bill; second column: editing amount; third column: two radio buttons (Now and Later); fourth column: choice of date. Movement in the table is done with the recommended keys for tables, but line and column headings are not announced during movement.  
 (T2 - Desjardins - TalkBack)

Choose a frequency. There's a Return image after each element on that list. Those images seem to be completely useless. It would be preferable to see a drop-down list containing all those choices. Then you return to the ($ amount) page.  
(T2 - RBC - JAWS)

Under the Payment sent - RBC online banking heading, you find the details of the bill payment that has just been made, and you can print the receipt displayed on the screen. Under the details of the transaction conducted, there are two buttons entitled Make another payment or transfer and Payment history. Between those two buttons, there's a link entitled Cancel a bill payment. It would be preferable for this link to be higher, that is, just before the button entitled Make another payment or transfer, so that it would be just under the details for the bill payment you've just made. That placement would've seemed more logical to me.

**Transaction search**

(T6 - RBC - VoiceOver)

There's a Consult statements button for checking PDF versions of statements for different periods, but, if I understand correctly, those statements appear in a table, and it's difficult to read the date of the transaction that was made. VoiceOver doesn't read the entire table but probably reads one column at a time. Maybe changes have to be made in the settings to get there. Therefore, it's easier to search with the suggested filters than enter a search manually.

(T3 - NBC - ZoomText)

Downloading transactions: PDF in image format, so unreadable by screen readers: I called customer service, and they told me that the problem is with my screen reader, so they couldn't help me. The personnel didn't seem to me to be trained on accessibility issues. No follow-up after the call.

(T2 - RBC - JAWS)

You see the level 3 heading entitled Hello, name of account holder between the level 1 heading entitled Summary of accounts and the first level 2 heading entitled Bank accounts. That heading slows down the navigation because it's incorrectly hierarchized and seems irrelevant.

**Modification of personal profile**

(T2 - RBC - TalkBack)

From the start of the web view, information is presented in the following order: level 1 heading (telephone), followed by a note and then a level 4 heading (your telephone numbers). A level 2 heading would have been more appropriate here.

**2.1.1 Keyboard accessibility (5 occurrences)**

**Bill payment**

(T2 - Desjardins - TalkBack)

The message Go to the next screen seems to me to be completely useless. Then you get to the amount with a modifiable area where you can indicate it. The keyboard presented here is a standard one, which is problematic. It should be a telephone type keyboard instead.

(T2 - Desjardins - TalkBack)

The month and year are in drop-down lists, but, for the day, you have to go through the calendar by sweeping from left to right until you find the right day to validate by clicking it. It would be preferable for the days to be in a drop-down list as well.

**Transfer**

(T2 - Desjardins - TalkBack)

The keyboard here is a standard type. It would've been certainly preferable to use a telephone keyboard.

**Transaction search**

(T9 - Desjardins - ZoomText)

Using a calendar to indicate a date is complicated because the calendar's too small. I often make mistakes on the month or the day, so I have to start that step over again several times, which makes me lose time and frustrates me. I like it better when I can write it with the keyboard of my tablet.

**Modification of personal profile**

(T2 - RBC - TalkBack)

Make an entry in the text field (phone number) and modify. A digital keyboard would have been preferable to a complete keyboard.

**1.3.3 Sensory characteristics (4 occurrences)**

**Bill payment**

(T8 - Desjardins - ZoomText)

The field for entering the amount of the payment is barely visible before you select it, as are the radio buttons you can select with the mouse to choose the frequency (now or later). When selected, those radio buttons are identifiable by a full circle at the centre, and then they become easier to perceive.

The radio button for selecting the account is barely visible before its activation with the mouse, but then it becomes easily perceptible (full circle in the centre) after it's selected. However, that radio button become slightly more identifiable when the mouse is moved over its surface (its outline becomes darker).

The content of those webpages and interface components are well presented and easy to interpret but barely perceptible for radio buttons and information entry fields.

My user experience could be better if that environment would support assistive technologies like ZoomText text-to-speech.

**2.4.2 Page heading (4 occurrences)**

**Transfer**

(T2 - RBC - JAWS)

Transfer between people: use tab once to reach the Submit button and validate. Then you find yourself on an untitled page (shared.headers.e-transfer.contact.review.tab-title). The title of that page should be changed.

(T2 - Desjardins - TalkBack)

To choose a recipient, you have to click on the person's name. The focus then moves to the start of the web view (Interac transfer). It's the same name as the one for the previous page, which can lead to confusion.

**Modification of personal profile**

(T2 - RBC - JAWS)

Once you change your password, you go back to a page entitled RBC online banking password. I'd prefer a different name here because some users could think that the modification didn't work.

(T2 - Desjardins - TalkBack)

If you want to change your phone number or e-mail address, you have to click on the Modify contact link. Then you go to the Change contact information page, which is the same name as other pages about changing your contact information and therefore confusing. The names of the pages in that section should be more specific.

**1.1.1 Non-textual content equivalents (3 occurrences)**

**Bill payment**

(T2 - Desjardins - TalkBack)

Their page labels are generally useless in terms of Talkback users understanding them, and they haven't usually correctly identified the buttons, menus or drop-down lists. In the short term, they have to correctly label those elements, and, in the long term, it would be desirable for the mobile application to have its own interface rather than use web views, which would increase the application's robustness in relation to the Talkback and Android versions of different users.

**Transfer**

(T4 - Desjardins - VoiceOver)

They recently replaced the checkbox with an image, and VoiceOver says [translation], "Activate the box to check it or deactivate the box," which is very confusing. It's no longer a checked box with a real box, which means that I don't know if I indeed have checked the box because the code programming highlights the opposite message for me.

(T2 - Desjardins - TalkBack)

You can choose payment frequency. You have to click on the Frequency element and then sweep from left to right in the window that appears, where you have the choices of Now, Once on ­\_\_, Weekly, Every two weeks, Bimonthly, Monthly, Quarterly or Annually. Between each of those choices is a Return image, which is completely useless for us.

**3.2.3 Consistent navigation (3 occurrences)**

**Transfer**

(T5 - Desjardins - JAWS)

Transferring between people (opens a dialogue box): when I look at the page on which I've landed, it doesn't resemble what I've known when I make transfers between people or via Interac. For example, the option to add a recipient isn't presented the same way.

**Transaction search**

(T4 - Tangerine - VoiceOver)

In the chequing account section, the search/filter region is at the top of the page and, in the section for my credit card, it's at the bottom of the page, which is a lack of consistency.

**Modification of personal profile**

(T6 - RBC - VoiceOver)

I made my selection by double tapping on the button to modify my telephone number. The main number appears followed by a link, Modify phone number. Under that link, there's a button, Delete phone number. It's the same thing for work phone or cell phone. I don't see the use of having several buttons and links when the function they serve is similar.

**3.2.4 Consistent identification (3 occurrences)**

**Bill payment**

(T6 - RBC - VoiceOver)

There's a repetition of the recipient list, which doesn't seem to me to be relevant. There's a list of recipients under a heading with the same name, and, after that list, there's a button to pay a bill to one of the recipients on your list. When you choose one, you have to go back to fill out fields to make the payment. When you choose the recipient from the first list presented to you, you go to the exact same location, that is, to fill out the fields to pay the bill.

(T6 - RBC - VoiceOver)

There are three buttons: New, History (what you paid in previous months), and Upcoming (programmed payments). The New and Upcoming buttons could create confusion it seems to me.

**Transaction search**

(T4 - Desjardins - VoiceOver)

To search for a transaction in your chequing account, there's a SEARCH button, while, for a credit card, there's a button called FILTER, which has the same function.

**3.3.2 Labels or instructions (2 occurrences)**

**Transfer**

(T9 - Desjardins - ZoomText)

I like the window confirming the deletion of a recipient's name because it appears in the middle of the screen. It's easy to pick out visually besides being simple to use with only two buttons: Cancel and Delete. For more clarity, I'd add the person's name to be deleted to the question [translation] "Do you want to delete this recipient?"

**Modification of personal profile**

(T7 - RBC - ZoomText)

Nothing lets me know how I have to enter a phone number (with or without parentheses/dashes), but, when I increase the size, I see that the system automatically enters the formatting for the number. NOTE: text-to-speech is sensitive depending on the position of the cursor on the word or sentence to be read, that is, it can only be a millimeter difference between being able to read or not!

**2.2.1 Insufficient time (2 occurrences)**

**Transaction search**

(T5 - Desjardins Visa - JAWS)

Although I've been sure to constantly use my keyboard, after some time, it still asks me if I want to continue my session (yes and no buttons), and I hear the seconds count down, which is very annoying. I use the yes button and continue. The snag is that I've only seen the message by accident by going to the bottom of my page out of curiosity to see what's there, and I saw that I had 10 seconds remaining.

(T1 - Desjardins - VoiceOver)

When conducting this type of search in my accounts with the mobile device several times, I've encountered the countdown to continue the session. I hear the countdown, but I've never managed to intercept the button to extend the session, so I've had to reconnect several times to finish the process.

**ONLY ONE OCCURRENCE WITH THESE GUIDELINES**

**3.3.1 Error identification, bill payment**

(T3 - NBC - ZoomText)

When I entered the amount of the bill, there was an error message because I put in a comma instead of a period, but I didn't see the error message until I had gone on to the next field because it appeared just below the field where I made the error, and ZoomText hadn't read the error message to me.

3.2.4 Consistent identification, bill payment (T3 - NBC - ZoomText)

It would be better if all the information could be aligned the same way, for example:

* Presented format
* From account
* Chequing account
* Hydro Québec
* Account no.
* 123 456 789
* Amount to be paid $20.00
* Frequency Once
* Payment date November 3, 2021

Desired format

* From account Chequing account
* Bill Hydro Québec
* Account no. 123 456 789
* Amount to be paid $20.00
* Frequency Once
* Payment date November 3, 2021

**3.2.3 Consistent navigation**

transaction search (T1 - Desjardins - JAWS)

Searching accounts: radio buttons facilitate a choice from the following options: all amounts, a specific amount or an exact difference. This step should be marked up in a table because, after specific date and the chosen exact difference, there are edit fields for the amounts. It would be much more consistent to mark them up in tables like the first two steps (list of accounts and type of deposit or withdrawal). The same problem comes up in the step for determining the timeframe.

\*Note to the reader for **APPENDIX 5**: Because our testers are Francophones, we conducted our testing on the French versions of the banking/financial websites in our study. The structure of the webpages in both languages is generally the same, so we believe that both the French and English versions of those pages contain the same problems for the most part.\*

## **APPENDIX 5 – Compliance testing**

**1. Home page**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Légende**  1. Laurentian Bank; 2.Bank of Montreal; 3. National Bank of Canada;  4. Imperial Bank of Commerce; 5. Desjardins;  6. Hong Kong and Shanghai banking corporation; 7. Royal Bank of Canada;  8. Scotiabank; 9. Tangerine; 10. Toronto Dominion | 1. [1. bit.ly/3qJr3mv](https://bit.ly/3qJr3mv) | 2. [bit.ly/3K6lkP2](https://bit.ly/3K6lkP2) | 3. [www.bnc.ca/](https://www.bnc.ca/) | 4. [bit.ly/3wl6jT0](https://bit.ly/3wl6jT0) | 5. [bit.ly/3NzhIaz](https://bit.ly/3NzhIaz) | 6. [bit.ly/3uDzDnX](https://bit.ly/3uDzDnX) | 7. [bit.ly/3JXoQLC](https://bit.ly/3JXoQLC) | 8. [bit.ly/3IMOBx3](https://bit.ly/3IMOBx3) | 9. [bit.ly/3LtGbfO](https://bit.ly/3LtGbfO) | 10. [go.td.com/3iPG2a0](https://go.td.com/3iPG2a0) |
| **Wave** |  |  |  |  |  |  |  |  |  |  |
| Missing alternative text (Error) |  |  | 1 |  |  |  | 3 | 2 |  | 1 |
| Missing or empty form label (Error) |  |  | 1 | 2 |  |  |  |  | 1 |  |
| Missing or empty button (Error) |  | 1 |  | 1 |  | 1 |  |  | 3 |  |
| Empty link (Error) | 1 |  |  | 1 |  |  |  |  | 1 | 9 |
| Very low contrast (Error) |  |  | 4 | 2 | 4 | 3 |  | 2 | 1 | 1 |
| Broken ARIA reference (Error) |  | 1 |  |  |  |  |  |  |  | 2 |
| Redundant alternative text (Alert) |  | 4 | 4 |  |  |  |  |  |  | 2 |
| Redundant link (Alert) |  | 9 |  |  | 4 | 7 |  | 7 | 1 | 13 |
| Very small text (Alert) |  |  | 5 |  |  |  | 2 |  | 1 | 6 |
|  |  |  |  |  |  |  |  |  |  |  |
| **AXE-DevTools** |  |  |  |  |  |  |  |  |  |  |
| Images must have alternate text (Critical) |  |  |  |  |  |  | 3 |  |  |  |
| Buttons must have programmatically determinable text (Critical) |  |  |  |  |  |  |  | 1 |  |  |
| IDs used in ARIA and labels must be unique (Critical) |  |  | 1 |  |  |  |  | 6 |  |  |
| Certain ARIA roles must be contained by particular parent elements (Critical) |  |  |  |  |  |  |  | 9 |  |  |
| ARIA attributes must conform to valid names (Critical) | 1 |  |  |  |  |  | 6 |  |  | 2 |
| Elements must only use allowed ARIA attributes (Critical) |  |  |  |  |  | 4 |  |  | 1 |  |
| ID attribute value must be unique (Serious) |  |  |  | 1 | 1 |  | 2 |  | 7 | 1 |
| Text elements must have sufficient color contrast against the background (Serious) | 19 | 3 | 7 |  | 8 | 10 | 23 | 2 | 5 | 17 |
| Links must have programmatically determinable text (Serious) | 1 |  |  | 17 |  |  |  |  |  | 9 |
| Interactive controls must not have focusable descendants (Serious) |  |  |  |  |  |  |  | 6 |  |  |
| <li> elements must be contained in a <ul> or <ol> (Serious) |  |  |  |  |  |  |  | 7 | 1 |  |
| <ul> and <ol> must only directly contain <li>, <script> or <template> elements (Serious) |  |  |  |  |  |  |  | 1 |  |  |
| Certain ARIA roles must contain particular children |  |  | 1 |  |  |  |  |  |  |  |
| ID attribute value must be unique |  |  |  | 4 |  | 2 |  | 2 | 5 | 1 |
| Ensure that links with the same accessible name serve a similar purpose | 1 |  | 1 | 2 | 8 | 4 | 1 |  |  | 3 |

## APPENDIX 5 – Compliance testing

**2. Frequently Asked Questions (FAQ)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Légende**  1. Laurentian Bank; 2.Bank of Montreal; 3. National Bank of Canada;  4. Imperial Bank of Commerce; 5. Desjardins;  6. Hong Kong and Shanghai banking corporation; 7. Royal Bank of Canada;  8. Scotiabank; 9. Tangerine; 10. Toronto Dominion  Note : for Laurentian Bank, the lang attribut of the HTML tag is absent. | 1. [bit.ly/3wP47pB](https://bit.ly/3wP47pB) | 2. [bit.ly/3NDiSlm](https://bit.ly/3NDiSlm) | 3. [bit.ly/3l1TSbC](https://bit.ly/3l1TSbC) | 4. [bit.ly/3IZTrXI](https://bit.ly/3IZTrXI) | 5. [bit.ly/3JWnGjL](https://bit.ly/3JWnGjL) | 6. [bit.ly/3qNjOtS](https://bit.ly/3qNjOtS) | 7. [bit.ly/36HdxJe](https://bit.ly/36HdxJe) | 8. [bit.ly/3wP3jkz](https://bit.ly/3wP3jkz) | 9. [bit.ly/3qRaF3k](https://bit.ly/3qRaF3k) | 10. [go.td.com/3NE6CkM](https://go.td.com/3NE6CkM) |
| **Wave** |  |  |  |  |  |  |  |  |  |  |
| Missing alternative text (Error) |  |  | 3 |  |  |  |  |  |  | 1 |
| Missing or empty form label (Error) |  |  | 3 | 2 |  | 4 |  |  | 1 |  |
| Missing or empty button (Error) |  |  | 1 |  |  | 1 |  | 1 | 3 |  |
| Empty link (Error) |  |  |  | 1 |  |  |  |  | 1 |  |
| Very low contrast (Error) | 2 |  | 4 | 2 | 1 |  |  |  | 1 | 1 |
| Broken ARIA reference (Error) |  |  |  |  |  |  |  |  |  |  |
| Redundant alternative text (Alert) |  |  | 4 |  |  |  |  |  |  | 2 |
| Redundant link (Alert) |  | 21 | 4 | 8 | 3 | 5 | 2 |  | 1 | 3 |
| Orphaned form label (Alert) |  |  |  | 2 |  |  |  |  |  |  |
| Very small text (Alert) |  |  | 5 |  |  |  | 3 | 2 |  | 5 |
|  |  |  |  |  |  |  |  |  |  |  |
| **AXE-DevTools** |  |  |  |  |  |  |  |  |  |  |
| Images must have alternate text (Critical) |  |  | 2 |  |  |  |  |  |  |  |
| IDs used in ARIA and labels must be unique (Critical) |  |  | 1 |  |  |  |  |  |  |  |
| Certain ARIA roles must be contained by particular parent elements (Critical) |  |  | 1 | 4 |  |  |  |  |  |  |
| Elements must only use allowed ARIA attributes (Critical) |  |  |  |  |  | 5 | 5 |  | 1 |  |
| ID attribute value must be unique (Serious) |  |  |  |  | 1 |  |  |  |  | 1 |
| Text elements must have sufficient color contrast against the background (Serious) | 129 |  | 19 | 3 | 33 | 7 | 15 | 25 |  | 14 |
| Links must have programmatically determinable text (Serious) |  |  |  | 1 |  |  |  |  |  |  |
| Interactive controls must not have focusable descendants (Serious) |  |  |  |  |  |  |  | 1 |  |  |
| <li> elements must be contained in a <ul> or <ol> (Serious) |  |  |  | 4 |  |  |  |  |  |  |
| <ul> and <ol> must only directly contain <li>, <script> or <template> elements (Serious) |  |  |  |  |  |  |  |  |  | 6 |
| Certain ARIA roles must contain particular children |  |  |  | 1 |  |  | 1 |  |  |  |
| ID attribute value must be unique |  |  |  | 3 |  | 1 |  |  |  | 1 |
| Ensure that links with the same accessible name serve a similar purpose |  |  | 1 |  | 6 |  |  | 7 |  |  |

## APPENDIX 5 - Compliance testing

**3. Contacting us**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Légende**  1. Laurentian Bank; 2.Bank of Montreal; 3. National Bank of Canada;  4. Imperial Bank of Commerce; 5. Desjardins;  6. Hong Kong and Shanghai banking corporation; 7. Royal Bank of Canada;  8. Scotiabank; 9. Tangerine; 10. Toronto Dominion  Note : for Laurentian Bank, the lang attribut of the HTML tag is absent. | 1. [bit.ly/3IPo1U1](https://bit.ly/3IPo1U1) | 2. [bit.ly/35wsGww](https://bit.ly/35wsGww) | 3. [bit.ly/3tSqzfQ](https://bit.ly/3tSqzfQ) | 4. [bit.ly/3Dt52NV](https://bit.ly/3Dt52NV) | 5. [bit.ly/3Lr1772](https://bit.ly/3Lr1772) | 6. [bit.ly/3tQHmQh](https://bit.ly/3tQHmQh) | 7. [bit.ly/36CqVOY](https://bit.ly/36CqVOY) | 8. [bit.ly/3iSfOUk](https://bit.ly/3iSfOUk) | 9. [bit.ly/3NBwyNF](https://bit.ly/3NBwyNF) | 10. [go.td.com/3wT114e](https://go.td.com/3wT114e) |
| **Wave** |  |  |  |  |  |  |  |  |  |  |
| Missing alternative text (Error) |  |  |  |  |  |  |  | 1 |  |  |
| Missing or empty form label (Error) |  |  | 1 | 2 |  | 4 |  | 2 | 1 |  |
| Missing or empty button (Error) |  | 1 |  |  |  | 1 |  |  | 3 |  |
| Empty link (Error) |  | 1 |  | 1 |  | 1 |  |  | 1 |  |
| Very low contrast (Error) | 2 |  |  | 2 | 1 |  |  |  | 1 | 1 |
| Broken ARIA reference (Error) |  |  |  | 1 |  |  |  | 1 |  |  |
| Redundant alternative text (Alert) |  | 4 | 4 |  |  |  |  |  |  | 2 |
| Redundant link (Alert) |  | 9 | 1 |  | 3 | 2 | 4 | 1 | 1 | 3 |
| Orphaned form label (Alert) |  |  |  | 2 |  |  |  | 1 |  |  |
| Very small text (Alert) |  |  | 5 |  |  |  | 3 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **AXE-DevTools** |  |  |  |  |  |  |  |  |  |  |
| Images must have alternate text (Critical) |  | 4 |  |  |  |  |  |  |  |  |
| IDs used in ARIA and labels must be unique (Critical) |  | 1 | 1 |  |  |  |  |  |  |  |
| Elements must only use allowed ARIA attributes (Critical) |  |  |  |  |  | 5 |  | 1 | 1 |  |
| ID attribute value must be unique (Serious) |  |  |  | 1 | 1 |  |  |  |  | 1 |
| Text elements must have sufficient color contrast against the background (Serious) | 16 | 1 | 11 | 1 | 39 | 10 | 23 |  |  | 13 |
| Links must have programmatically determinable text (Serious) |  |  |  | 1 |  |  |  |  |  |  |
| Certain ARIA roles must contain particular children |  |  | 2 |  |  |  |  |  |  |  |
| ID attribute value must be unique |  | 1 |  | 4 |  | 1 | 1 | 1 | 1 | 1 |
| Ensure that links with the same accessible name serve a similar purpose | 1 |  | 2 |  | 8 | 1 | 1 |  |  |  |

## APPENDIX 5 - Compliance testing

**4. Lost/stolen card**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Legend**  1. Laurentian Bank; 2.Bank of Montreal; 3. National Bank of Canada;  4. Imperial Bank of Commerce; 5. Desjardins;  6. Hong Kong and Shanghai banking corporation; 7. Royal Bank of Canada;  8. Scotiabank; 9. Tangerine; 10. Toronto Dominion | 1. [bit.ly/3tTJM0s](https://bit.ly/3tTJM0s) | 2. [bit.ly/3iuJXs8](https://bit.ly/3iuJXs8) | 3. [bit.ly/3DqkE4J](https://bit.ly/3DqkE4J) | 4. [bit.ly/3pupybc](https://bit.ly/3pupybc) | 5. [bit.ly/36VFd9C](https://bit.ly/36VFd9C) | 6. [bit.ly/3tQHmQh](https://bit.ly/3tQHmQh) | 7. [bit.ly/36VuPCf](https://bit.ly/36VuPCf) | 8. [bit.ly/3hUxBe0](https://bit.ly/3hUxBe0) | 9. [bit.ly/3qRaF3k](https://bit.ly/3qRaF3k) | 10. [go.td.com/36W7cWK](https://go.td.com/36W7cWK) |
| **Wave** |  |  |  |  |  |  |  |  |  |  |
| Missing alternative text (Error) |  |  |  |  | 2 |  |  | 2 |  |  |
| Missing or empty form label (Error) |  |  | 2 | 2 |  | 4 |  | 2 | 1 |  |
| Missing or empty button (Error) |  | 1 |  |  |  | 1 |  |  | 3 |  |
| Empty link (Error) | 1 |  |  | 1 |  | 1 |  |  | 1 |  |
| Very low contrast (Error) |  |  |  | 2 | 1 |  |  |  | 1 | 1 |
| Broken ARIA reference (Error) |  | 1 |  |  |  |  |  | 1 |  |  |
| Redundant alternative text (Alert) |  | 4 | 4 |  |  |  |  |  |  | 2 |
| Redundant link (Alert) | 2 | 9 |  | 6 | 6 | 2 |  | 1 | 1 | 3 |
| Orphaned form label (Alert) |  |  |  | 2 |  |  |  | 1 |  |  |
| Very small text (Alert) | 1 |  | 5 |  |  |  | 3 |  |  | 5 |
|  |  |  |  |  |  |  |  |  |  |  |
| **AXE-DevTools** |  |  |  |  |  |  |  |  |  |  |
| Images must have alternate text (Critical) |  |  |  |  |  |  |  | 1 |  |  |
| Certain ARIA roles must be contained by particular parent elements (Critical) |  | 3 |  |  |  |  |  |  |  |  |
| ARIA attributes must conform to valid names (Critical) | 1 |  |  |  |  |  |  |  |  |  |
| Elements must only use allowed ARIA attributes (Critical) |  |  |  |  |  | 5 |  | 1 | 1 |  |
| ID attribute value must be unique (Serious) |  |  | 1 |  | 1 |  |  |  |  |  |
| Text elements must have sufficient color contrast against the background (Serious) | 7 | 4 | 9 |  | 24 | 10 | 24 |  |  |  |
| Links must have programmatically determinable text (Serious) | 1 |  |  |  |  |  |  |  |  |  |
| <li> elements must be contained in a <ul> or <ol> (Serious) |  | 3 |  |  |  |  |  | 5 |  |  |
| Certain ARIA roles must contain particular children |  | 1 | 1 |  | 1 |  |  |  |  |  |
| ID attribute value must be unique |  | 1 |  |  | 1 | 1 |  | 1 |  |  |
| Ensure that links with the same accessible name serve a similar purpose | 3 |  | 1 |  | 5 | 1 |  |  |  |  |

## APPENDIX 5 - Compliance testing

**5. Opening an account**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Legend**  1. Laurentian Bank; 2.Bank of Montreal; 3. National Bank of Canada;  4. Imperial Bank of Commerce; 5. Desjardins;  6. Hong Kong and Shanghai banking corporation; 7. Royal Bank of Canada;  8. Scotiabank; 9. Tangerine; 10. Toronto Dominion | 1. [bit.ly/39uM8bQ](https://bit.ly/39uM8bQ) | 2. b[it.ly/3Nzd8cp](https://bit.ly/3Nzd8cp) | 3. [bit.ly/3tVDwFA](https://bit.ly/3tVDwFA) | 4. [bit.ly/3qMbESr](https://bit.ly/3qMbESr) | 5. [bit.ly/3GuOjdC](https://bit.ly/3GuOjdC) | 6. [bit.ly/3LsSzfU](https://bit.ly/3LsSzfU) | 7. [bit.ly/3wYbqM1](https://bit.ly/3wYbqM1) | 8. [bit.ly/3IWzam3](https://bit.ly/3IWzam3) | 9. [bit.ly/3LsIT55](https://bit.ly/3LsIT55) | 10. [go.td.com/3NBwHkp](https://go.td.com/3NBwHkp) |
| **Wave** |  |  |  |  |  |  |  |  |  |  |
| Missing alternative text (Error) |  |  | 4 | 1 |  |  | 2 |  |  |  |
| Missing or empty form label (Error) |  |  | 1 |  |  | 3 |  |  | 1 |  |
| Missing or empty button (Error) | 1 |  |  |  |  | 1 |  | 5 | 3 |  |
| Empty link (Error) | 7 |  |  |  |  |  |  | 1 | 1 | 1 |
| Very low contrast (Error) | 6 | 6 |  |  | 1 | 1 | 1 | 1 | 1 | 1 |
| Broken ARIA reference (Error) |  | 1 |  |  |  |  |  |  |  |  |
| Redundant alternative text (Alert) |  |  | 4 |  |  |  |  |  |  | 2 |
| Redundant link (Alert) | 1 | 3 |  |  | 2 | 2 | 33 | 8 | 8 | 10 |
| Orphaned form label (Alert) |  |  |  |  |  |  |  |  |  |  |
| Very small text (Alert) | 3 |  | 5 |  |  |  | 53 |  |  | 5 |
|  |  |  |  |  |  |  |  |  |  |  |
| **AXE-DevTools** |  |  |  |  |  |  |  |  |  |  |
| Images must have alternate text (Critical) |  |  | 4 |  |  |  | 1 |  |  |  |
| IDs used in ARIA and labels must be unique (Critical) |  |  | 1 |  |  |  |  |  |  |  |
| Certain ARIA roles must be contained by particular parent elements (Critical) |  |  |  |  |  |  |  | 9 |  |  |
| ARIA roles used must conform to valid values (Critical) |  |  |  |  | 1 |  |  |  |  |  |
| Elements must only use allowed ARIA attributes (Critical) |  | 2 |  |  |  | 6 | 1 |  | 1 |  |
| ID attribute value must be unique (Serious) |  |  |  |  |  |  |  |  |  | 1 |
| Text elements must have sufficient color contrast against the background (Serious) | 2 | 23 | 7 | 9 | 21 | 8 | 73 | 1 | 2 | 13 |
| Links or buttons must have programmatically determinable text (Serious) | 1 | 1 |  |  |  |  |  | 1 |  | 1 |
| <li> elements must be contained in a <ul> or <ol> (Serious) |  |  |  |  |  |  |  | 7 |  |  |
| <ul> and <ol> must only directly contain <li>, <script> or <template> elements (Serious) |  |  |  |  |  |  |  | 1 |  |  |
| Certain ARIA roles must contain particular children |  |  | 1 |  |  |  |  |  |  |  |
| aria-hidden elements do not contain focusable elements |  |  |  |  |  |  |  | 4 |  |  |
| ID attribute value must be unique | 1 |  |  |  |  | 2 | 1 |  |  | 3 |
| Ensure that links with the same accessible name serve a similar purpose | 1 | 1 | 3 |  |  |  |  |  |  | 2 |

## APPENDIX 5 - Compliance testing

**6. Fees and interest rates**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Legend**  1. Laurentian Bank; 2.Bank of Montreal; 3. National Bank of Canada;  4. Imperial Bank of Commerce; 5. Desjardins;  6. Hong Kong and Shanghai banking corporation; 7.Royal Bank of Canada;  8. Scotiabank; 9. Tangerine; 10. Toronto Dominion  Note : for National Bank of Canada, the lang attribut of the HTML tag is absent. For Laurentian Bank, there’s 5 occurrences of empty table headers. | 1. [bit.ly/3NvA6RE](https://bit.ly/3NvA6RE) | 2. [bit.ly/3tVmt6t](https://bit.ly/3tVmt6t) | 3. [bit.ly/3Dtk5qH](https://bit.ly/3Dtk5qH) | 4. [bit.ly/3qNIous](https://bit.ly/3qNIous) | 5. [bit.ly/3uEiB9c](https://bit.ly/3uEiB9c) | 6. [bit.ly/3wT55RK](https://bit.ly/3wT55RK) | 7. [bit.ly/3qRXrDs](https://bit.ly/3qRXrDs) | 8. [bit.ly/3K2CHAr](https://bit.ly/3K2CHAr) | 9. [bit.ly/35up7XE](https://bit.ly/35up7XE) | 10. [go.td.com/3tV2BAv](https://go.td.com/3tV2BAv) |
| **Wave** |  |  |  |  |  |  |  |  |  |  |
| Missing alternative text (Error) |  | 1 |  |  |  |  |  |  |  | 2 |
| Missing or empty form label (Error) |  |  |  | 2 |  | 4 |  |  | 1 |  |
| Missing or empty button (Error) |  | 1 |  | 1 |  | 1 |  | 1 | 3 |  |
| Empty link (Error) |  | 36 | 5 |  |  |  |  | 1 | 1 |  |
| Broken ARIA reference (Error) |  | 1 |  |  |  |  |  |  |  | 5 |
| Very low contrast (Error) |  | 5 | 38 | 2 | 1 | 1 | 1 | 2 | 1 | 1 |
| Redundant alternative text (Alert) |  | 4 |  |  |  |  |  |  |  | 2 |
| Orphaned form label (Alert) |  |  |  | 2 |  |  |  |  |  |  |
| Redundant link (Alert) |  | 13 | 3 |  | 5 |  | 106 | 2 | 1 | 10 |
| Very small text (Alert) |  |  | 5 |  |  |  | 130 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **AXE-DevTools** |  |  |  |  |  |  |  |  |  |  |
| Certain ARIA roles must be contained by particular parent elements (Critical) |  |  |  |  |  |  |  | 9 |  |  |
| Elements must only use allowed ARIA attributes (Critical) |  |  |  |  |  | 6 | 1 |  | 1 |  |
| ID attribute value must be unique (Serious) |  |  |  |  | 1 |  |  |  |  | 1 |
| Text elements must have sufficient color contrast against the background (Serious) | 1 |  | 133 | 3 | 3 | 8 | 80 | 2 |  | 13 |
| Links or buttons must have programmatically determinable text (Serious) | 1 |  | 5 | 1 |  |  |  | 1 |  | 1 |
| <li> elements must be contained in a <ul> or <ol> (Serious) |  |  |  |  |  |  |  | 7 |  |  |
| <ul> and <ol> must only directly contain <li>, <script> or <template> elements (Serious) |  |  |  |  |  |  |  | 1 |  |  |
| ID attribute value must be unique |  |  |  | 4 |  | 1 | 4 | 2 |  | 1 |
| Ensure that links with the same accessible name serve a similar purpose | 1 |  | 6 | 1 | 6 |  | 1 |  |  | 1 |
| Ensures table headers have discernible text | 5 |  | 3 |  |  |  |  |  |  |  |

## APPENDIX 6: Online banking/financial appreciation poll (questionnaire)

Do you use online banking/financial services?

Do you have a visual, motor, hearing or learning disability?

If so, this poll is for you!

**WHAT IS THE PURPOSE OF THIS POLL?**

It is intended to collect user accounts of the limitations in online banking/financial services for people living with visual, motor, hearing or learning disabilities.

**WHO'S CONDUCTING THIS PROJECT?**

Funded by the members of the Government of Canada, specifically, Accessibility Standards Canada (<https://bit.ly/38qpior>), the poll and the project for which it is being conducted are the responsibility of RAAQ project coordinator René St-Pierre. You can reach him at [projet.accessibilite@raaq.qc.ca](mailto:projet.accessibilite@raaq.qc.ca).

**HOW WILL THE POLL DATA BE USED?**

They will be used for study, analysis, research, distribution and publication, but they will also be anonymous. Therefore, your personal information (name, email address and phone number) will never be made public.

**ARE THEIR BENEFITS IN PARTICIPATING IN THIS POLL?**

Yes, the main benefit in participating is the fact that your contribution will increase the knowledge and awareness of a subject still not documented and studied enough in Quebec and the rest of Canada. Ultimately, we believe that the results of this poll will help to improve the accessibility and overall usability of online banking/financial services.

**Section 1: about you**

1. Did another person fill out the poll for you?

* Yes
* No

2. Where do you live?

3.How old are you?

4. What is your banking/financial institution? (you can check more than one) (BMO, NBC, RBC, Scotiabank, TD, HSBC, Desjardins or Tangerine)

5. With what type of disability are you living?

If it's a visual disability, how would you describe your vision level?

* Low vision
* Functionally blind with residual vision
* Total blindness
* If you have a motor disability, does it interfere with or limit your use of your online banking/financial services?
* No
* Yes (please provide details)
* Do you receive less than $20,000 income annually (considered to be low income)?
* Yes
* No
* Prefer not to answer

**Section 2: computing environment**

1. What type of computing device do you use for your banking/financial services? You can check more than one type (checkbox).

* Computer
* Tablet
* Phone
* Other (specify)

2. What type of computer do you mainly use? (radio buttons)

* PC
* Mac

3. Which web browser do you use most often? (radio buttons)

* Chrome
* Firefox
* Safari
* Edge
* Internet Explorer

1. Which assistive technology do you use? (checkbox)

* JAWS
* NVDA
* ZoomText
* ZoomText with text-to-speech
* VoiceOver
* Talkback
* Other (specify)
* Doesn't apply to my situation

4. How do you connect to your banking/financial institution account?

* Identifier/password
* Facial recognition
* Touch recognition

5. If you use a smart phone or tablet, with what type of interface do you conduct your transactions?

* Mobile application
* Website
* Don't know

6. Do you receive total or complete funding from the government or any other institution for your computing equipment?

* No
* Yes

If you answered yes, check the equipment that applies to you:

* computer - funded by
* assistive technology (Jaws, ZoomText, etc.) - funded by
* braille reader - funded by
* phone - funded by

**Section 3: Appreciation of your online services**

1. Which banking/financial services do you use?

* Bill payments
* Transfers between accounts
* Transfers between people
* Interac transfers
* Checking my balance or transactions
* Applying for home insurance
* Investments
* Other (specify)

2. Which computing device do you use to make those transactions?

* I make the following transactions with my computer:
* I make the following transactions with my phone:
* I make the following transactions with my tablet:

3. I have trouble making bill payments.

* Completely agree
* Somewhat agree
* More or less agree
* Somewhat disagree
* Strongly disagree

If you answered somewhat or completely agree with the statement, please explain what problems you have encountered. Some examples are poor colour contrast, unlabelled form fields, text that is difficult to understand, menus that are difficult to navigate, too much informational content, too many links or clickable regions, lost screen focus, no feedback following an action, etc.

4. I have trouble making transfers between people, between accounts or via Interac.

* Completely agree
* Somewhat agree
* More or less agree
* Somewhat disagree
* Strongly disagree

If you answered somewhat or completely agree with the statement, please explain what problems you have encountered. Some examples are poor colour contrast, unlabelled form fields, text that is difficult to understand, menus that are difficult to navigate, too much informational content, too many links or clickable regions, lost screen focus, no feedback following an action, etc.

5. I have trouble checking my account balance.

* Completely agree
* Somewhat agree
* More or less agree
* Somewhat disagree
* Strongly disagree

If you answered somewhat or completely agree with the statement, please explain what problems you have encountered. Some examples are poor colour contrast, unlabelled form fields, text that is difficult to understand, menus that are difficult to navigate, too much informational content, too many links or clickable regions, lost screen focus, no feedback following an action, etc.

6. I have trouble finding specific information when I consult my banking/financial institution's website or mobile application.

* Completely agree
* Somewhat agree
* More or less agree
* Somewhat disagree
* Strongly disagree

If you answered somewhat or completely agree with the statement, please explain what problems you have encountered. Some examples are how to pay bills, where to find a branch, how to make a transfer, how to report a lost or stolen credit/debit card, how to talk to someone, etc.

7. I use the FAQ to find information on my banking/financial situation's website.

* Yes, very often
* Yes, sometimes
* Yes, but I have trouble.
* Specify the problems encountered
* I never use the FAQ.

If you never use the FAQ, please tell us why:

* I have no need to use it because the site is clear enough as it is.
* In the list of suggested questions, I can't find one that fits with mine.
* The way the questions are written is confusing or unclear.
* Another reason (specify)

8. The headings, menu navigation and different sections of my banking/financial institution's website are sufficiently clear and explicit.

* Completely agree
* Somewhat agree
* More or less agree
* Somewhat disagree
* Strongly disagree

9. To find information on the website, I use the search region, which is often represented by a magnifying glass, where I can ask a question.

* Yes, very often
* Yes, sometimes
* I never use their search region.

If you never use the search region, please tell us why.

* I have no need to use it because the site is clear enough as it is.
* When I've used the search region, it has often given me results that don't fit with my question.
* Other reason (specify)

10. When I couldn't find information on the website, I called customer service and finally got an answer to my question.

* Completely agree
* Somewhat agree
* More or less agree
* Somewhat disagree
* Strongly disagree
* I've never tried to reach customer service.

If you didn't get an answer, explain the reason to us in a few words.

11. When I couldn't find information on the website, I filled out the contact form or sent an email to customer service and finally got an answer to my question.

* Completely agree
* Somewhat agree
* More or less agree
* Somewhat disagree
* Strongly disagree
* I've never tried to contact customer service using the form or via email.

If you didn't get an answer, explain the reason to us in a few words.

12. Have you ever used the virtual assistant function (chatbot) available on the website?

* I don't know about those tools or functions on the website.
* Yes, I've used the virtual assistant before.

If you used the virtual assistant before, did you communicate with a:

* real person?
* robot answering you with automatic messages?

If you are willing, we would like to know more about your experience.

**Section 4: Poll conclusion** (optional section)

1. In your opinion, how could online banking/financial services be made more accessible?

2. Are there any other points or subjects you would like to discuss that were not covered in this poll?

* No
* Yes

If you answered yes, please explain (text field).

3. Can we contact you for more details on some of your poll answers?

* Yes
* No

If you answered yes, please give us your contact information:

* Name:
* Email address:
* Telephone:

On behalf of the RAAQ, I want to thank you very much for participating in this poll.

**René St-Pierre**, RAAQ project coordinator

1. <https://bit.ly/3vJqxXi> [↑](#footnote-ref-1)
2. Our body of research concerns 10 Canadian financial institutions: Laurentian Bank of Canada, Bank of Montreal (BMO), National Bank of Canada (NBC), Canadian Imperial Bank of Commerce (CIBC), Desjardins, Hong Kong and Shanghai Banking Corporation (HSBC), Royal Bank of Canada (RBC), Scotiabank, Tangerine and Toronto Dominion (TD). [↑](#footnote-ref-2)
3. Specifically, appreciation testing was conducted with a focus group of three people with cognitive disabilities. [↑](#footnote-ref-3)
4. This section is extracted and slightly adapted from *Web* *Types of Disabilities and Associated Barriers: Introduction to Web Accessibility (Ryerson Universit*y*)*. Source: <https://bit.ly/3wg4N7b> [↑](#footnote-ref-4)
5. Low vision is a loss of eyesight that cannot be sufficiently improved with conventional glasses, contact lenses or medical or surgical interventions. Low vision interferes with everyday tasks. A person with low vision may find it very hard to accomplish activities such as reading, writing, shopping, watching television, driving a car or recognizing faces. Source: <https://bit.ly/3rUlB0H> [↑](#footnote-ref-5)
6. According to the 2017 Canadian Survey on Disability, 1.5 million Canadians (5.4% of the population) age 15 and older are living with visual disabilities. Source: <https://bit.ly/3LuAePR> [↑](#footnote-ref-6)
7. <https://bit.ly/3OWkwiX> [↑](#footnote-ref-7)
8. According to COPHAN members, a disability is defined as the result of the interaction between what pertains to the person (e.g., the type of disability) and what pertains to the environment (e.g., barriers to inclusion). Source: Accessibilité du Web - de la standardisation à l’utilisabilité. <https://bit.ly/31hQONz> [French-only] [↑](#footnote-ref-8)
9. <https://bit.ly/3s0pTUk> [↑](#footnote-ref-9)
10. As the basis of a progressive enforcement plan, that mechanism also includes inspections, orders, administrative penalties and even prosecutions and fines. To learn more about compliance with this act, see <https://bit.ly/3vt3y3J> [↑](#footnote-ref-10)
11. <https://bit.ly/3L6I69E> [↑](#footnote-ref-11)
12. “other than i. success criteria 1.2.4 Captions (Live), and ii. success criteria 1.2.5 Audio Descriptions (Pre-recorded).” O. Reg. 191/11, s. 14 (4). <https://bit.ly/3MCbGor> [↑](#footnote-ref-12)
13. <https://bit.ly/3vPJS9q> [↑](#footnote-ref-13)
14. <https://bit.ly/3vYfKbM> [↑](#footnote-ref-14)
15. Those standards concern employment, housing and accommodation, built environment, the way in which goods, services and information are provided and received and the activities and businesses that regulations designate. [↑](#footnote-ref-15)
16. <https://bit.ly/3Fcs0d6> [↑](#footnote-ref-16)
17. <https://bit.ly/377Da6g> [↑](#footnote-ref-17)
18. <https://bit.ly/3kvKzPH> [↑](#footnote-ref-18)
19. The *Act to secure the handicapped in the exercise of their rights* was adopted in 1978. After the members of the National Assembly of Quebec amended it in depth in 2004, the title was changed to the [*Act to secure handicapped persons in the exercise of their rights with a view to achieving social, school and workplace integration*](https://bit.ly/376F6fl)*.* [↑](#footnote-ref-19)
20. <https://bit.ly/3ssWZwr> [↑](#footnote-ref-20)
21. <https://bit.ly/3iz0ATZ> [French only] [↑](#footnote-ref-21)
22. <https://bit.ly/3w1eyV2> [↑](#footnote-ref-22)
23. <https://bit.ly/37Wvjc5> [↑](#footnote-ref-23)
24. The functional assessments were first used to explore webpages from the users’ points of view to identify the navigation problems and were crucial for verifying the compatibility and usability of all interactive elements like drop-down menus, dialogue boxes and slide shows. Source: <https://labo.raamm.org/formation/evaluation/fonctionnelle/> [French only] [↑](#footnote-ref-24)
25. Our selection of those types of uses was based on the responses from the initial 29 study candidates. [↑](#footnote-ref-25)
26. Distribution for this subgroup: 1. Functionally blind with residual vision: 25 (41%); 2. Total blindness: 21 (34%); 3. Low vision/functionally sighted: 11 (18%) 4. Deafblindness: 4 (7%) [↑](#footnote-ref-26)
27. For internal reasons, COPHAN members withdrew from the project in January of 2022. [↑](#footnote-ref-27)
28. The poll form is in APPENDIX 4. Some of the poll questions have not been included in these results because we believe that the answers we obtained for those questions did not indicate accessibility problems. [↑](#footnote-ref-28)
29. We used the Likert scale. To learn more about that psychometric tool, consult <https://bit.ly/38UiNd4> [↑](#footnote-ref-29)
30. Percentage of respondents doing business with, in descending order: Desjardins (42%), NBC (20%), RBC (12%), TD (7%) and BMO (7%) [↑](#footnote-ref-30)
31. Distributed as follows: 1. Functionally blind with residual vision: 25 (41%); 2. Totally blind: 21 (34%); 3. Low vision/functionally sighted: 11 (18%) 4. Deafblindness: 4 (7%) [↑](#footnote-ref-31)
32. The difference between the percentage of respondents using text-to-speech (85%) and of those using magnifiers (20%) is due to the fact that the ZoomText software combines the two. [↑](#footnote-ref-32)
33. In the province of Quebec, RAMQ funds assistive technologies such as JAWS and braille readers, but only students and employees can take advantage of updates of them. Furthermore, the fact that operating system updates sometimes require updates to some software could also contribute to restricting some users. [↑](#footnote-ref-33)
34. The figures in the questions correspond with the questionnaire figures. [↑](#footnote-ref-34)
35. According to Encyclopédie Universalis [French only], cognitive overload means a mental state experienced when engaged in carrying out tasks that are extremely demanding and not having sufficient cognitive resources to implement those tasks readily: <https://bit.ly/351Ejv0>. In the social sciences category, Miller's law is that the number of objects an average human being can retain in the short-term memory is about seven (magic number 7) plus or minus 2. Source: <https://bit.ly/3CRt0lD> [French only] [↑](#footnote-ref-35)
36. Cognitive disorientation here results from the difficulty that people encounter when they are looking for information by navigating the Internet. Source: <https://bit.ly/3KZYLeL> [French only] [↑](#footnote-ref-36)
37. See APPENDIX 3: Transactional Testing Questionnaire [↑](#footnote-ref-37)
38. It was not possible to recruit enough testers in the context of the study to verify the functionality of all the sites' transactional pages. [↑](#footnote-ref-38)
39. Guideline definitions: <https://bit.ly/3NaKrBL> [↑](#footnote-ref-39)
40. WAVE: <https://bit.ly/39e3oV6>; Axe DevTools: <https://bit.ly/370l8CJ> [↑](#footnote-ref-40)
41. For security issues, no banking/financial institution administrators would agree to give us access to practice accounts, which would have allowed us to conduct compliance testing on the transactional part of their websites. [↑](#footnote-ref-41)
42. # For this type of problem, we suggest using a specialized tool such as the Colour Contrast Analyser available at <https://bit.ly/3L5GTiH>

    [↑](#footnote-ref-42)
43. [https://dequeuniversity.com/rules/axe/4.4/image-alt](https://dequeuniversity.com/rules/axe/4.4/image-alt?application=AxeChrome) [↑](#footnote-ref-43)
44. <https://dequeuniversity.com/rules/axe/4.4/listitem> [↑](#footnote-ref-44)
45. <https://dequeuniversity.com/rules/axe/3.4/aria-required-parent> [↑](#footnote-ref-45)
46. <https://dequeuniversity.com/rules/axe/4.4/label> [↑](#footnote-ref-46)
47. [https://dequeuniversity.com/rules/axe/4.4/color-contrast](https://dequeuniversity.com/rules/axe/4.4/color-contrast?application=AxeChrome) [↑](#footnote-ref-47)
48. [https://dequeuniversity.com/rules/axe/4.4/link-name](https://dequeuniversity.com/rules/axe/4.4/link-name?application=AxeChrome) [↑](#footnote-ref-48)
49. [https://dequeuniversity.com/rules/axe/4.4/identical-links-same-purpose](https://dequeuniversity.com/rules/axe/4.4/identical-links-same-purpose?application=AxeChrome) [↑](#footnote-ref-49)
50. <https://dequeuniversity.com/rules/axe/4.4/duplicate-id-aria> [↑](#footnote-ref-50)
51. <https://dequeuniversity.com/rules/axe/4.4/duplicate-id-active> [↑](#footnote-ref-51)
52. [https://dequeuniversity.com/rules/axe/4.4/aria-hidden-focus](https://dequeuniversity.com/rules/axe/4.4/aria-hidden-focus?application=AxeChrome) [↑](#footnote-ref-52)
53. [https://dequeuniversity.com/rules/axe/4.4/duplicate-id-active](https://dequeuniversity.com/rules/axe/4.4/duplicate-id-active?application=AxeChrome) [↑](#footnote-ref-53)
54. <https://dequeuniversity.com/rules/axe/4.4/aria-valid-attr-value> [↑](#footnote-ref-54)
55. [https://dequeuniversity.com/rules/axe/4.4/nested-interactive](https://dequeuniversity.com/rules/axe/4.4/nested-interactive?application=AxeChrome) [↑](#footnote-ref-55)
56. [https://dequeuniversity.com/rules/axe/4.4/aria-allowed-attr](https://dequeuniversity.com/rules/axe/4.4/aria-allowed-attr?application=AxeChrome) [↑](#footnote-ref-56)
57. <https://dequeuniversity.com/rules/axe/4.4/aria-command-name> [↑](#footnote-ref-57)
58. [https://dequeuniversity.com/rules/axe/4.4/button-name](https://dequeuniversity.com/rules/axe/4.4/button-name?application=AxeChrome) [↑](#footnote-ref-58)
59. To learn more about these four principles, consult <https://bit.ly/39wW8UK> [↑](#footnote-ref-59)
60. https://www.w3.org/WAI/fundamentals/accessibility-intro/ [↑](#footnote-ref-60)
61. <https://labo.raamm.org/formation/aria-html5/> [French only] [↑](#footnote-ref-61)
62. A WAI-ARIA authoring practices guide is here: <https://bit.ly/3tzSlgY> [↑](#footnote-ref-62)
63. Top six WAI-ARIA mistakes to avoid are here: <https://bit.ly/3tAyiid> [↑](#footnote-ref-63)
64. <https://bit.ly/3ktVB8l> [↑](#footnote-ref-64)
65. Although VoiceOver users manipulate the phone interface mainly by touching it, it is possible to enrich the user experience by connecting a braille reader via Bluetooth. At the time this report was being written, however, TalkBack, the integrated Android OS screen reader, did not support that functionality. [↑](#footnote-ref-65)
66. <https://bit.ly/3kDpTVW> [French only] [↑](#footnote-ref-66)
67. <https://bit.ly/3KBcLLG> [↑](#footnote-ref-67)
68. <https://labo.raamm.org/formation/evaluation/> [French only] [↑](#footnote-ref-68)
69. The elements presented here are from <https://bit.ly/3vFUEAg>, a webpage initially based on [The Business Case for Digital Accessibility.](https://bit.ly/3s9jXbC)There are case studies in the form of best web accessibility practices. [↑](#footnote-ref-69)
70. <https://bit.ly/3y85HDR> [↑](#footnote-ref-70)
71. <https://bit.ly/3OUk30l> [French only] [↑](#footnote-ref-71)
72. <https://bit.ly/3svEkjB> [↑](#footnote-ref-72)