
Enabling Access for All – The Yahoo! Mail Way

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Abstract

Accessibility is often looked upon as a Design and Development overhead. Whereas by implementing some simple techniques, we can reach out to a very large challenged audience and create a huge impact.

This paper demonstrates how Yahoo! Mail Classic has made life easier for millions of visually challenged people by identifying Key Scenarios of Online Email Communications

and implementing relevant techniques to make it accessible and in the process complying to several W3C – WCAG (World Wide Web Consortium – Web Content Accessibility Guidelines)

We have explained our Accessibility story through Guru – Our Primary Persona for Visually Challenged, his online communication activities, how he uses Yahoo! Mail Classic to perform his daily activities, how we made Yahoo! Mail Classic accessible to him, the W3C – WCAG Guiding Principle that helped us make Yahoo! Mail Classic accessible.

Keywords

Web Accessibility, Interaction Design, Usability, E Mail Design Best Practices

Introduction

As per the World Health Organization (WHO), there are 600 million people with disabilities in the world, which is approximately 10% of the total population globally. Approximately 1.1 billion people depend on Internet for their daily activities and information.

Yahoo! Mail is one of the most visited email service globally. It gets around 280 million active users and 1.3 billion page views per day. The visually challenged

access the Internet with the help of assistive technologies. Even though the design of Yahoo! Mail is time tested and provides substantial usability, it is not always helpful to the visually challenged users. Yahoo! mail has done a lot of enhancements to make it work for visually challenged users.

What is Web Accessibility?

As per World Wide Web Consortium (W3C), Web accessibility means that people with disabilities can use the Web. More specifically, Web accessibility means that people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web.

What is Assistive Technology?

International Standards Organization (ISO) defines assistive technology as "Hardware or Software products used by people with disabilities to accomplish their tasks.

As per the US section 508 Law, The term 'assistive technology' means technology designed to be used in an assistive technology device or assistive technology service.

There are a various products in the market that supports in providing online information to the visually challenged users.

Screen Magnifiers: This is especially helpful for people with low vision. Screen Magnifiers allow them to magnify some sections of the page as per their requirement. Screen magnifiers are also known as screen enlargers or large print programs.

Screen Readers: This is useful for people who are blind. The text content in the interface is made

available as speech. This device can also let the users know the images if alternative text information is available at the back end. They are also known as blind access utilities or screen reviewers. The widely used screen readers are 'Job Access with Speech' (JAWS) and 'Non Visual Desktop Access' (NVDA).

Braille Displays: This device covertes the screen content into Braille display with the help of a series of pins to form Braille symbols.

Speech Recognition: The spoken language gets consumed by the computer and interpreted as a command.

This paper addresses the following:

- Accessibility process in Yahoo! Mail Classic
- Guru – Our Primary Persona for Visually Challenged
- Guru's online communication behavior
- How Yahoo! is helping out Guru in his day to day online communication.
- What exactly Yahoo! implemented to solve some of the problems of Guru?
- Recommendations for Improving Web Email Accessibility
- Conclusion

Accessibility Process in Yahoo! Classic Mail

'Complete Accessibility' is the key motto of the classic mail product. Yahoo! is initiating best possible support for assistive technologies, so that the visually challenged users also can avail features with similar ease and comfort as the perfect sighted users.

Accessibility Experts were involved right from the start of the project, and it was involved as a center movement in the entire production cycle. The design prototypes and specifications included accessibility features and the Engineers received trainings in assistive technologies. Once the prototype was done it was tested with assistive technologies and re iterated for enhancements. Yahoo! accessibility guidelines and global accessibility guidelines were followed while developing this product.

Guru – Our Primary Persona

Age 24, lives in Bangalore, India

Occupation:

- He teaches Mathematics in a primary school at Bangalore
- His educational background is Bachelors in Science
- He is learning languages such as C,C++ to enhance his technical skills
- He is actively involved in some of the initiatives for National School of Blind for the visually challenged people in the India

Family:

- He is unmarried and lives with his parents
- Brother stay in a nearby city, and he often visits him

Lifestyle:

- He lives in a three bedroom apartment
- He is a music enthusiast

What Yahoo! Mail Classic mean to Guru?

- Main communication channel with his extended family members and friends who are out of town

Goals:

- Aspire to tech technology to other visually challenged people in the next two years
- Wants to collaborate and keep in touch with the other members in the global society who are visually challenged

Pain Points:

- Gathering information efficiently over the internet since not all the sites are accessible to visually challenged users

Guru's Online Communication - Summary

Guru Expects: *"Online communication should be as seamless as possible for everyone".*

Internet brings people from diverse field and culture together and provides a chance to get them expressed. The enormous amount of user-generated content is testimony to the fact that online communication has significantly changed and influenced our lives.

Guru does not know the difference between red and white, he is blind right from the childhood. As a child he was a very intelligent boy, and was never depended on anybody for his day to day task. As he grew up, he wanted the same level of comfort from web. He depends on internet for activities such as communicating with his friends and family members. He also communicates regularly with his mentor, who lives abroad.

Yahoo! mail enables him to keep in touch with his friends and family and assistive technologies such as JAWS screen reader enables him to use his computer effectively.

In the coming sections of this paper, we will discuss his online journey with Yahoo! Mail, and how Yahoo! enabled him in doing his tasks productively.

Guru's Online Communication - Scenario 1 Checking mail messages

Guru is back from his work and checks his Yahoo! mail. He is wondering if his friend Senthil has replied to his last message he had sent last night. To view his messages and act on them, he needs to first open the browser, Sign In to his email account, check all his new mails, read the specific email and then reply to that mail.

Users with perfect vision follow a standard routine of clicking on the browser icon in the desktop, typing the web address i.e. <http://mail.yahoo.com>. Look at the email folder list to find out number of new/unread messages (highlighted by the bold text). They then quickly scan the entire page and read the email text.

How Guru achieves this task currently? How this experience is different for visually challenged users?

Guru clicks on the Windows start menu and then clicks on 'run' and types www.mail.yahoo.com to visit the web page. The login page loads with default cursor position in the user name field. After providing username and password information, the mail dashboard appears. The moment he visits the mailbox, he is informed about the unread mails. Guru cannot

differentiate between bold and non bold; he cannot visually scan the page or directly hit the mail he wants to read. Now, what are the ways to help out Guru?

Guiding WCAG Principle for the Scenario 1: Provide Perceivable Information to the Users

As per the Web Content Accessibility guideline (WCAG) 2.0 by World Wide Web Consortium (W3) guidelines, the information and user interface components should be perceivable to the visually challenged users. The information that is visible to the people with normal vision should also be accessible to the visually challenged users.

How Yahoo! Mail Classic helps Guru to achieve Scenario 1: Checking mail messages

- Whenever any new mail appears in the inbox, this is treated as an alert and read out first
- Perception of the bold text is handled at the back end in such a way that it is read by the screen readers but invisible to the sighted users. Off-screen content and absolute positioning is provided
- The email flags are toggles and not images. These are div tags at the backend
- Implemented audio CAPTCHA in Yahoo mail Japan to enable visually challenged users.
- Text alternatives are provided for images, especially important icons such as 'Attach'
- Markup content comprise of start and end tags and solid code structure so that the data can be interpreted accurately by the user agents and assistive technologies
- Usage of , , for list of items

- Header tags for module headings (H1 / H2 / H3 etc) instead of CSS categorization
- No alternative text is provided for decorative icons in the 'Folder' section; these icons are not necessary for the visually challenged users and are ignored by the assistive technologies.
- Resizable text without the assistive technologies
- Custom CSS is provided to help users with low vision. They can adjust the contrast based on their specific needs.
- All the tool tips are accessible
- Markup linearization helps screen readers to optimize for search engines

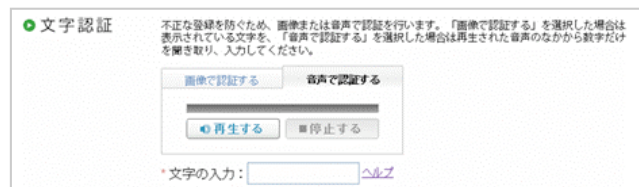


Figure1 Yahoo! Japan Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA) for visually challenged users.

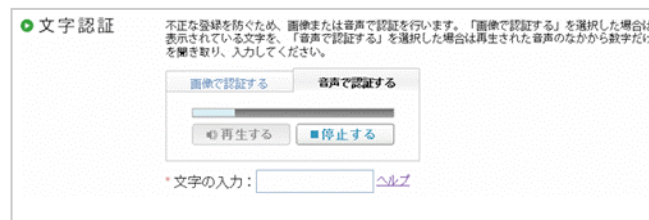


Figure2 Yahoo! Japan Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA) for visually challenged users. On click of the audio, the screen reader reads out the text on screen.

Guru's Online Communication - Scenario 2 Maintaining folder list

Today's hectic life style keeps everybody busy, and people do not get a chance to meet often in person. Guru wants to maintain a unique folder for his childhood friend 'Neal'. In his leisure, Guru wants to go back to his folder list and read those emails.

Currently most users with perfect vision rely on visual cues of 'Add' and 'Edit' links in the 'My Folder' list. The visual grouping and context provide the information that the Add and Edit actions items are for the 'My Folder' list. However, for visually challenged users, the context needs to be set in terms of audio.

Guiding WCAG Principle for the Scenario 2: Provide Perceivable Information to the Users

As per the Web Content Accessibility guideline (WCAG) 2.0 by World Wide Web Consortium (W3) guidelines, the information and user interface components should be perceivable to the visually challenged users. The information that is visible to the people with normal vision should also be accessible to the visually challenged users.

How Yahoo! Mail Classic helps Guru to achieve Scenario 2: Maintaining folder list

- 'Add' and 'Edit' action links in the 'My Folder' section is read as 'Add to my folder' and 'Edit my folder'

- Due to the screen real estate the Add and Edit links are visible as it is to the perfect sighted users, but different for differently-abled users.
- There are no hidden tags to completely move it out of the screen
- Off-screen tags to manage both the scenarios for sighted as well as visually challenged users

Guru's Online Communication - Scenario 3 Ensuring Password Security

Guru raised some questions on his favorite subject to his mentor John, who lives in Canada. Last night he got some response from him. He opens the Yahoo mail in front of his friends to show them the mail chain between him and his mentor. At the same time he wants to ensure that his password is not read by the screen reader.

Currently most users with perfect vision click on the password input box. They are able to do this in front of others as they are confident that the password will not be visible to others and will appear as asterisks.

How does Guru ensure that his password is safe and not legible to others?

Guru needs to be indicated that a text is entered in the input box, at the same time the screen readers should not read it aloud.

Guiding WCAG Principle for Scenario 3: Provide robustness in order to be accessible to the variety of assistive technologies

As per the World Wide Web Consortium (W3) guidelines, the information and user interface components should be robust, and the content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.

The information that is visible to the people with normal vision should also be accessible to the visually challenged person.

How Yahoo! Mail Classic helps Guru to achieve Scenario 3: Ensuring Password Security

- Provided the same password metaphor as it is for the normal sighted users
- Provided auditory indications that of text input
- The screen readers do not read the password letters exactly as it is but read it as 'star'

Guru's Online Communication - Scenario 4 Message flags

Guru is into his Yahoo! mail inbox, and he checks three checkboxes from the list of mail messages in order to flag them. He needs to know the current state and post action state.

Visual cues are enough for perfect eye sight users to do this task. However, for visually challenged users, any

state changes needs to be perfectly addressed by the screen readers.

How does Guru ensure that he checking the messages? He can not see the visual toggle changes.

**Guiding WCAG Principle for Scenario 4:
Provide robustness in order to be accessible to the variety of assistive technologies**

As per the World Wide Web Consortium (W3) guidelines, the information and user interface components should be robust, and the content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies. The information that is visible to the people with normal vision should also be accessible to the visually challenged person.

How Yahoo! Mail Classic helps Guru to achieve Scenario 4: Message flags

Mechanism to know the state of a particular check box is true or false while selecting a specific message.

- The users are notified of any checkbox state is change and flagged messages are programmatically identified
- Micro formats are used to fetch the data which are repeated such as the email id etc.

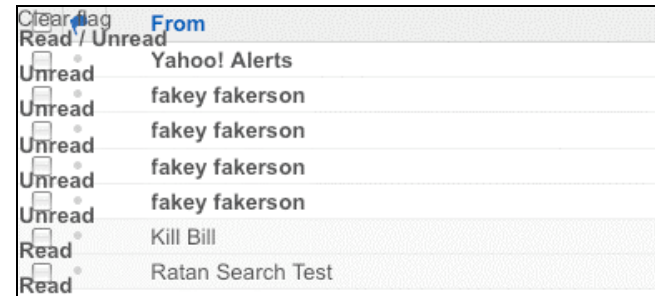


Figure 3 The checked and unchecked states are visible to the screen readers at the back end

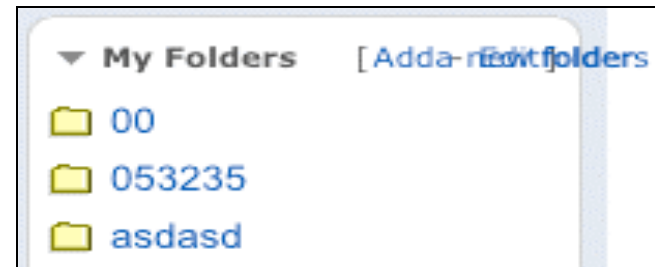


Figure 4 Contextual Action links to help the visually challenged users identify the actions even when it is not used in context. This is how the page is visible to the screen readers

Usual Code

```
<a href="folders?add=1" >Add<span class="ofscreen">anew folder</span></a>
```

Accessible Code

```
<a href="folders?add=1" >Add<span class="ofscreen">a new folder</span></a>
```

```
<style>.ofscreen{position:absolute;top-999px;left:-999px;}</style>
```

The screenshot shows an email composition window with the following fields:

- To:** sharv|
- Cc:** <sharvari_ghosh@yahoo.co.in>, <sharvari@yahoo-inc.com>
- Subject:** Online. Chat now!

Below the subject line, there is a small red circle icon followed by the name "sharvari_ghosh".

Figure 5 Use of Micro formats to pre populated email addresses

Guru's Online Communication - Scenario 5 Keyboard accessibility

Guru is participating in a discussion with the other members of the mathematics teaching staff in his school. He is very fast in keyboard access and totally depends on the same. He wants to ensure that he is at pace with the other members in showcasing his ideas.

Currently most users with perfect vision achieve this task by mouse cursor position on screen. However, some of the actions are done through keyboard.

How does Guru ensure that he is at pace with the other member in such a scenario?

He is an expert in keyboard interaction and depends on the virtual screen cursor, which can be easily identified by the screen readers. He also knows the access keys for fast access to some of the sections in the screen. He needs a mechanism to quickly reach the important sections of the screen.

Guiding WCAG Principle for Scenario 5: Provide operable user interface components and navigation

As per the World Wide Web Consortium (W3) guidelines, the information and user interface components should be keyboard friendly without any keyboard traps. The interface should be operable to the visually challenged users with equal ease as to the perfect sighted users.

There are some design elements which causes equal frustrations to both sets of users, perfect sighted as well as visually challenged. For example, if there are any moving or flashing texts; especially for more than five seconds, can cause seizures to many users.

How Yahoo! Mail Classic helps Guru to achieve Scenario 5: Keyboard accessibility

- Provided access keys to allow users to enter keystroke input to Yahoo! Mail
- Provides landmarks for important sections such as
 - Banners
 - Main Content
 - Search
 - Navigation
 - Alerts
- Content is designed in such a way that it does not cause seizures. There are no flashes or scrolling text
- No keyboard traps: If the user moves away from the current focus by mouse, then there are ways to

either go back to the previous section or move forward to achieve some other task.

Guru's Online Communication - Scenario 6: Searching a mail

Guru wants to search one of his old mails from his colleague named Jaya. He identifies the search mail section and types his colleague's name. He is provided with seven emails from the last six months. Two of those mails are from his colleagues; he reads the specific mail and replies to her.

Currently most users with perfect vision rely on mouse click, hover events and label for input box. Yahoo! mail classic does not provide any label for the 'search mail section'. However, this not an issue for the perfect sighted users since the button label is descriptive.

How does Guru understand about the search input box?

Guru needs to be aware of the labels before he initiates any action. The screen should not automatically update or provide any surprise to him. Also, he should be in a position to revert to the previous state if required.

Guiding WCAG Principle for Scenario 6: Provide understandable information and the operation of user interface

As per the World Wide Web Consortium (W3) guidelines; the user must be able to understand the information as well as the operation of user

interface.

The language used in an interface plays an important role in the application. Easy language of page and parts not only helps the visually challenged users but also the perfect sighted users. Whenever an idiom or jargons are used, there should be a way to identify the meaning of those words or sentences.

How Yahoo! Mail Classic helps Guru to achieve Scenario 6: Searching a mail

- When any component receives focus, it does not initiate a change of context.
- Language emphasis is obtained programmatically
- Language tags mentioned below provides the code to emphasize on specific words



Figure 6 Markup of Yahoo! Mail Landing Page

- `` This sentence has strong emphasis ``

- ``This sentence has emphasis
``
- Provided elaborate input assistance: There is no label for the search input box but at the back end the screen reader can read out the Off-screen text items, which explicitly mentions the label as 'search'
- Error Prevention: Confirmation messages are prompted when a mail message is send without a subject

Recommendation to Enhance Accessibility in E Mail Services

There is a lot of opportunity still remaining for Email services in the following areas:

- Integrate complete Accessible Rich Internet Applications (ARIA)
- Provide easy to navigate the mail message list since visually challenged users access the message list frequently
- Provide a way to Identify the current location in the pool of mail messages
- Provide contextual actions such as 'Delete', 'Reply' buttons very handy
- Enable default accessibility features
- Update the virtual buffer so that the new content is read along with the new message items.
- Ensure non decorative images comprise of an ALT tags

- Invest in user testing and research to understand the challenges faced by visually challenged users
- Collaborate with the browsers and screen reader vendors to improve the support for Accessible Rich Internet Applications (ARIA)
- Enable accessible chat features in emails for real time communication
- Provide awareness to the Stakeholders, Developers and Designers on web accessibility implementation
- Make the browsers compatible with assistive technologies, since users in remote areas are not up-to-date with the latest trends and technology
- Provide candid feedback messages
- Incorporate live region properties and roles

Conclusion

There is a major section of the society that use internet for their day to day activities. As described in the above usage scenarios, assistive technologies help visually challenged users in a substantial way. If we include some of the basic and minimum level of accessibility best practices into the site building process it can help a lot of people worldwide. There is need for a communication ecosystem for visually challenged users, where they can interact within the community on various subjects such as health care, work and employment opportunities etc.

Screen readers are not available in local languages globally and some users find it very difficult to follow the American and British English accent.

Accessible rich Internet Applications (ARIA) is a major area that needs our attention, since majority of the sites are based upon web 2.0. Currently Fire fox 3.0x, IE 8, Opera 9.5 support Accessible Rich Internet.

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