

Review of Some Assistive Software for Blind

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ABSTRACT- Computer is an important part of our life. There are number of technologies available for visually impaired people to do their daily tasks on computers independently. It is the responsibility of government to provide equal access of all services for e.g. electronic media, internet etc. to all people of its country. However majority of the blind people do not access computers, phones and other electronic media. The main reason behind it is the lack of awareness of the various kinds of assistive technologies among these people. The paper describes various assistive technologies that help blind to access computer and web. The problems that are faced by blind while using these technologies are also discussed in this paper.

General Terms: Web Accessibility, W3C (World Wide Web Consortium), WCAG (Web Content Accessible Guidelines), WAI (Web Accessibility Initiative)

Keywords: Assistive Software, Assistive Technology, Accessibility.

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1. INTRODUCTION

Assistive technology generally [16] refers as the technology that helps people with disability to do activities of their life efficiently. Sometimes assistive technology is taken same as adaptive technology however these two are the different terms, assistive technology is termed as any item or equipment to enhance the functional capabilities of disabled persons while adaptive technology is the technology which covers items that are particularly designed for disabled people and also used by normal persons.

The rest of the paper describes the assistive technology for blind in *section 2*, *section 3*; defines accessibility, *section 4*; describes assistive software for blind, *section 5*; issues related to assistive software, *section 6*; related work and *section 7*; conclusion of the paper.

2. ASSISTIVE TECHNOLOGY FOR BLIND

Assistive technology [16] helps blind people to perform different tasks such as use of computers for email, net browsing, reading books, making music etc. As normal person blind can also use computer. In market different kinds of assistive software technologies are available that help blind to access electronic media for e.g. computers, phones etc. Some

technologies are licensed based not freely available and some are open source.

There are number of technologies [13] that are used by visually impaired people to use computers. Screen [2] Reader and Brail system are two most widely used assistive technologies by blind people. After getting training of assistive software the blind can efficiently use computer without any help.

3. ACCESSIBILITY

Accessibility [18] defines that product, design and services should be designed in such a manner so that they can be easily accessed. Sometimes accessibility and usability are considered as same thing however both differs. Usability means the design should be user friendly and easily accessible to its user but it do not consider users with disability. If accessibility increases it will automatically enhance usability but vice versa is not true. In order to make web accessible for people with disability WAI of W3C published WCAG first version WCAG 1.0 in 1999 and second version WCAG2.0 [6] in 2008. These guidelines provide four principles for Web designers:

1. **PERCEIVABLE.** Content should be presentable to its user.
2. **OPERABLE.** Any user can operate web content easily without any trouble.
3. **UNDERSTANDABLE.** The web content should contain simple and understandable language
4. **ROBUST.** Web technology which can make content to work with current and future accessibility technologies and user agents.

4. ASSISTIVE SOFTWARE FOR BLIND

The different kinds of assistive software technologies are discussed as below [10].

4.1 Screen Reader

Screen reader [2] is software that uses text to speech engine in order to provide on screen information to blind in form of speech or brail. The different operating systems have different screen readers.

Table 1: Different types of Screen Reader for different Operating Systems

Operating System	Screen Reader
Linux	Orca[12]
MAC	Voice Over[11]
Windows	JAW (Job Access with Speech)[17]

NDVA (Non-Visual Desktop Access) [7] is also a screen reader that is freely available to users. It uses different combination of key strokes to get input.

4.2 Brail Display

Brail display [2] is an electro-mechanical device used blind. It contains cell of rows as the information on screen changes the brail characters also changes and gives refresh information to users.

4.3 Mobile Applications

The smart phones provide in built mobile applications for e.g. Voice Dream [9] Reader, VoiceOver [11] to blind users. These applications help blind to use touch screen by taking input as gesture and speech as output.

5. ISSUES RELATED TO ASSISTIVE SOFTWARE

There are some issues related to assistive software's that cause frustration to its users. The visually challenged users take more time as compared to the normal users due to these problems. The main problem with screen reader is that images that are without text information [8] always remain inaccessible for its users. Majority of the web sites have common web accessibility problems. The web sites failure to include text alternatives for images, some provide text alternatives to images but there is no guarantee that text is meaningful. CAPTCHA (Completely Automated Public Turing test to Tell Computers and Humans Apart) is used to distinguish between a human and computer. For visually impaired people it is totally inaccessible [10]. The text alternative should be used for CAPTCHA but most of the web sites fail to provide text alternatives for CAPTCHA. Flash, ambiguous links, complex form, missing improper heading, too many[5] links, complex data forms, inaccessible search, and lack of skip tag are the common mistakes which make inaccessible web for blind people [3].

6. RELATED WORK

Prof. Reeta Singh [2] author describes assistive software technology for blind people. The working of screen reader software and brail display is described in this paper. The paper also describes the difficulties which are faced by blind people while using screen reader. Sergio Luján-Mora [3] shows common web accessibility issues which cause frustration to blind while accessing the websites. The blind [5] can also use

touch screen mobiles. Some smart phone provides Voiceover software for blind. Voiceover takes input as gesture and gives speech as output. The paper proposes a web based and mobile based application for visually impaired people. Yevgen Borodin, et al. [1]. Given paper describes the different browsing strategies used by blind to access the web pages. By using these strategies the navigation becomes easy for blind users. The users take less time to navigate. The comparative analysis between Facebook and YouTube on the basis of its usability for blind has been shown in this paper. The paper [4] also shows different web accessibility problems that blind users of mobile social application face frequently. The paper presents two case studies in order to identify the limitations of social mobile application and the computer based application for visually impaired people. The research shows that the mobile version of Facebook is more accessible for blind as compared to desktop version.

7. CONCLUSION

We live in digital world. Our daily activities like reading newspaper, storing information, getting education, banking e.tc are shifting towards digital technology. As normal people, the person with disability also needs digital media. The people should be aware of different assistive technologies available for them to use digital media. These technologies empower blind people. They become self-dependent. The barriers that create problems for blind to access digital equipment should be removed. Equal access of all technologies to blind should be provided by society.

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