Survey of Existing Electronic Readers for the Blind

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Abstract - *Thanks to advancements in technology, a wide variety of electronic readers are available for the visually challenged with multiple input and output format options. We found out that the cost of most devices on offer is quite high. So, there exists a place for a new low cost, high translation accuracy and highly portable (small in size) device.*

Key Words: Blind, Electronic Readers, Stand-Alone Readers, Screen Readers, Speech Output, Braille Displays

1.INTRODUCTION

There are two types of reading devices to help the visually challenged.

1. Stand-Alone reading devices:

These are independent devices that do not require a computer of any form to work. They can be bulky (not portable) Examples: Braibook, Portset Reader, Aira Horizon, Canute 360

2. Screen Reading Software:

Screen Readers are software products placed on computing devices that assist the blind to read text material via audio or Braille output. Examples:[1] KNFB Reader, Microsoft Narrator, JAWS Screen Reader, NVDA open source screen reader, VoiceOver, Talkback, ChromeVox, Speakup, ORCA

2. STAND-ALONE READING DEVICES

2.1 Braibook [2]

It is a reading device with just one Braille character. The reader's finger rests on the device while the text moves through the cell in it. The text files must be inserted or loaded into the device. It has an option to access a menu via joystick. It has an option to increase or decrease reading speed. The device is priced at € 395 (Rupees 34,682/-) excluding Value Added Tax and shipping costs.

Pros: It is small in size, mobile and doesn't need equipment like tables (support surface). It is portable and easy to carry. The user is able to read text files anywhere and anytime. It uses Braille output. Use of sound output can result in dangerous distractions, while in the outdoors. It only needs one hand to be used. Files can be read in PDF, Epub and TXT format.

Limitations: The user needs to know Braille language. The text content must be in digital format.The cost of the product is highly prohibitive.

Braibook

2.2 Portset Reader [3]

It consists of a rectangular unit (scanner) kept on a flat surface. It is powered by AC supply. A set of headphones is used for audio output. To operate the device, a set of keys are provided at the front of the rectangular unit.

Pros: Both voice and speed of voice can be changed. Files can be stored for later reading.

Cons: Occasionally, the keys won't respond until one waits for the whole status message is read till the end. Frequent changes to scanner settings for contrast and brightness is needed for reading different kinds of documents.

Portset Reader
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2.3 Similar Products [3]

SARA: Scanning and Reading Appliance
Copyright © nfb.org

The ScannaR
Copyright © nfb.org

Extreme Reader XR10

Copyright © nfb.org

3. SCREEN READING SOFTWARE

3.1 Seeing AI App from Microsoft [4]

The main features include the ability to read out text, recognize Indian currency notes, recognize facial features and decipher emotions.
Pros: It's free of cost.
Cons: Smartphone is needed for the App

Seeing AI App (Microsoft)
© indiatimes.com

3.2 Microsoft Narrator:[6]

Narrator is a screen reading software bundled with Windows OS. Nothing extra needs to be installed. One can read any window open in the OS. One can change the speed and volume of the speech. One can read applications, emails and items on the net.

3.3 JAWS Screen Reader: [7]

JAWS (Job Access with Speech) provides a way for the blind to surf the web, write a document, read emails with audio(speech) and Braille output.

Cost: 95 dollars (Rupees 7840/-) per year
Pros: Apart from other obvious features, one can navigate with a mouse and can fill out forms on the web
Limitations: Requires a Windows OS with high processing speed and high amount of storage to store word voices.

JAWS Screen Reader
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3.4 NVDA (NonVisual Disk Access): [8]

It helps blind users to interact with Windows OS and many third party applications.These applications include web browsers like Firefox, Chrome, email clients, internet chat software, music players and programs like Microsoft Windows and Microsoft Word.

Cost: Free (Open Source Software)

Pros:
Built-in synthesizer for 55 languages.
Ability to run from a USB Flash Drive.
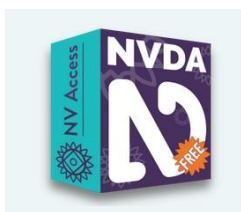Reports text formatting like font type, font size.
Reports spelling errors.
Enthusiastic and helpful user community.

Cons:
Requires a Windows PC.
High amount of RAM, Processor and Disk Space is needed.

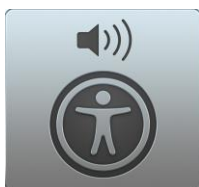

NVDA Screen Access

3.5 VoiceOver: [9]
It's a pre-installed software in Mac OS for visually challenged people that reads documents and windows open in the OS.

Pros: Screen Magnification for low vision users.
Pre-installed in Apple computers. Refreshable Braille displays can be connected and used.
Limitations: Requires Mac OS.

VoiceOver App for Mac OS

3.6 Similar Products

- Talkback (Android)
- ChromeVox (Google Chrome Extension)
- Speakup (Linux)
- ORCA (Linux)

4. CONCLUSIONS

Even though, we have covered many electronic reading devices, there is still a space available for lower costing, more accurate, more mobile devices to fulfill this role of electronic rreading as technology improves and hardware components becomes better and cheaper. Open source software is predicted to play a bigger role in this set of devices in the years to come.

ACKNOWLEDGEMENT

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