OPEN-SOURCE TECHNOLOGIES FOR VISUALLY CHALLENGED LIBRARY PATRONS

Dr. Sridhara R N

Chief Librarian

Central Library

MVJ College of Engineering, Bangalore.

Swapna A

Library Assistant

Central Library

MVJ College of Engineering, Bangalore.

Abstract: The NVDA open-source applications we have experienced as very useful aids for the integration of people suffering from visual impairments, from hypotension to actual blindness. The application is based on speech synthesis and has been experienced by disabled Academic Staff and students. The second experience is oriented to Library Patrons with low residual vision, and it provides their educators and parents with easy-to-use tools for image manipulation, specially designed for exploiting residual visual abilities.

Index Terms - **NVDA, Nonvisual Desktop Access, windows, operating system, Libraries, Screen Reading Software.**

1. Introduction

The increasing interest in the promotion of education for visually impaired students, at any level, has correspondingly increased also the number of blind college students, who successfully graduate in all subjects. At the same time, libraries are enforcing the adoption of accessible technologies to help disabled library patrons in their studies, work, and social life. In the same Libraries, there have been also many actions in support of open-source technology adoption within Academic and social life. Yet today most software to be used as computer desktop-based aid for disabled citizens is proprietary, and it is often acquired with open-source access, by schools, Colleges, and universities Libraries. The possibility of using open source aids for disabled people has been investigated by the authors, having in mind the specific needs of a blind student, Computer Desktop Windows operating systems, to be installed in student Digital libraries used for performing physics experiments.

2. about NVDA-Nonvisual Desktop Access

Michael Curran and James Teh met as children at a music camp for the blind, where they realized they shared a strong interest in computers. Several years later they decided to join forces to help improve the accessibility of computers for blind and vision-impaired people.

For blind people to use a computer, they need a screen reader that reads the text on the screen in a synthetic voice or with a braille display. But in many cases, screen reading software costs more than the computer itself. In the past, this has left computers inaccessible to millions of blind people around the world. This is a critical problem, because, without computers, access to education and employment is severely limited, not to mention everyday functions such as online banking, shopping, and news.

In April 2006 Michael began to develop a free screen reader called NVDA (Nonvisual Desktop Access) for use with computers running on Windows. He invited James, who had recently completed his IT degree, to develop the software with him. Together these two fully blind men founded the not-for-profit organization NV Access to support the development of the NVDA screen reader. Before too long they were able to work full-time on the project thanks to a series of corporate grants and individual donations.

NVDA has been translated by volunteers into more than 55 languages and has been used by people in more than 175 countries. It has also won multiple awards. NVDA is open-source software, which means the code is accessible to anyone. This enables translators and developers around the world to continually contribute to its expansion and improvement.

3. Identification of NVDA Logo

Figure – 1 (source- https://www.nvaccess.org/about-nvda/)

The NVDA logo is a stylized blend of the letters NVDA in white on a square purple background. There is a vertical line on the left with a rounded hook to the right at the bottom as if starting to form the bottom corner of a "D". Then from the top-left, a straight diagonal line comes down to the right. Next, a line curves in a semi-circle out to the right and then back up to the top. The line finishes in a downward hook with a curved end. The vertical and diagonal lines make the first part of the letter N and also the letter A (without the crossbar). The diagonal and curved lines form a V, and the curve is the right part of the D. For a description of the NV Access logo, please visit the About NV Access page. (URL link For download - https://www.nvaccess.org/download/)

4. Features

- NVDA enables blind and vision-impaired people to interact with the Windows operating system and a wide range of third-party apps.

- Support for popular applications such as web browsers like Mozilla Firefox and Google Chrome, email clients, internet chat software, music players, and office programs like Microsoft Word and Excel.

- Built-in speech synthesizer that supports over 55 languages, as well as support for many other 3rd party voices.

- Reporting of textual formatting where available, such as font name and size, style and spelling errors.

- Automatic announcement of text under the mouse and optional audible indication of mouse position.

- Support for many refreshable braille displays, including Braille input via braille displays with a braille keyboard

- Capability to run on Windows logon screens and other secure screens

- Announcing controls and text when interacting with touch screen motions.

- Optional telephone support and extensive training materials are offered at a nominal cost.

- A kind and helpful user community.

5. System Requirements

• Operating Systems: Windows 7, Windows 8, Windows 8.1, Windows 10, Windows 11, and all Server Operating Systems beginning with Windows Server 2008 R2.

NVDA requires Service Pack 1 or higher for Windows 7.

NVDA requires Service Pack 1 or above for Windows Server 2008 R2.

• Memory: 256 MB or more of RAM

• Processor speed: 1.0 GHz or above • About 90 MB of storage capacity.
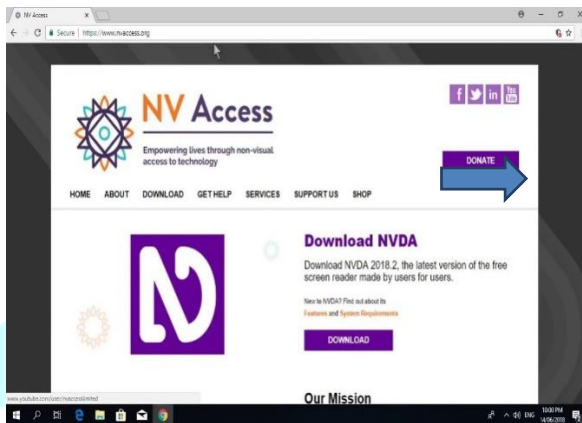
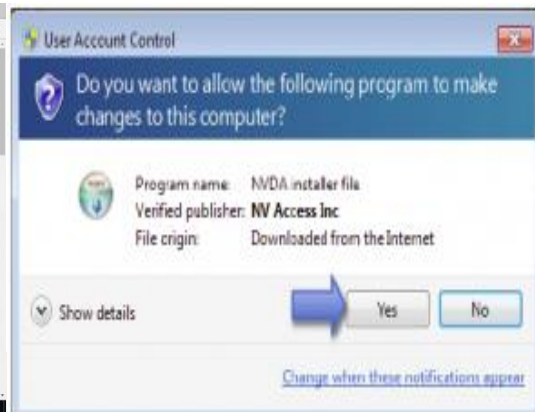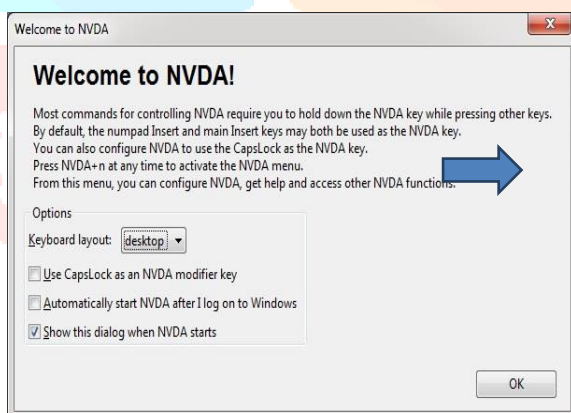## 6. Installation process

Figure-2
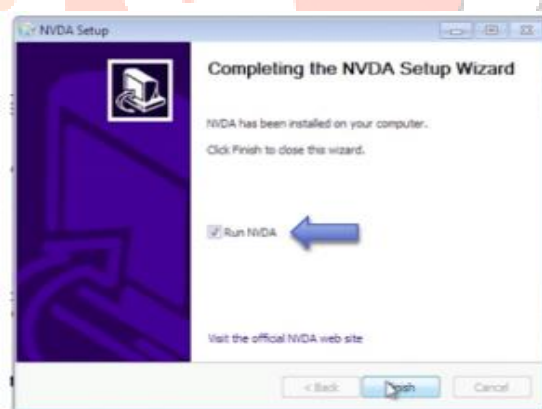

Figure-3

Figure-4

Figure-5

7. NVDA is the secret formula for libraries

Here's why NVDA is the secret formula libraries always wanted, 100% free to use globally, so students never have to worry about how they're going to afford screen reading software again, Quick simple, no-fuss installation, so you can start using the screen reader faster, Fast, light-weight and small footprint ensures superior stability, reliability, and less crashes, so you're more productive and An easy, intuitive, and comfortable experience to use, so you'll have a stress-free, enjoyable time using your computer. Just as powerful and functional as the paid screen reader alternatives, so you'll never have to sacrifice quality. Portable on a USB stick, making your life so much easier! Great for easily using computers other than your own, on the go, and Available in multiple languages. Great if you speak a minority language where the options are limited or expensive. Our open-source community develops add-ons and also contributes directly to NVDA itself. This makes NVDA a truly user-driven project. Gives you peace of mind that you can always stay up-to-date with technology and never have to worry about affording costly updates. Feel good that you're standing behind the most ethical screen reader available, developed by the blind for the blind.

Figure- 6: Details NVDA website homepage

8. Donate to NVDA

The NVDA screen reader allows some of the world's poorest blind people access to computers and a way out of poverty. If you have the means, no matter how big or small, please become a marvelous monthly donor or make a one-off donation, before downloading NVDA.

9. Conclusions

Aids for disabled people represent an application domain that seems especially suited for the open-source paradigm since the unavoidable need for adaptation to the actual degree of disability is best satisfied by open-source software. experience has shown that existing open-source tools may represent good disability aids. Of course, proprietary software aids exist as well, with comparable or higher quality. However, the quality of open-source solutions is already sufficient for many users.Use of such softwaretogether with Festival shall allow us to rely on open-source software only.The fact that speech synthesis open-source software exists does not mean that itis trivial to run it and that our installation shall represent a solution for all hypo-seeing problems. From the user's perspective, knowledge of Braille, the presence of residual vision, and personal preferences may suggest a completely different approach with respect to ours. Daily errands are no longer a hassle thanks to NVDA. In general use of NVDA has helped people get an education and lead productive lives. Its portable nature makes it so easy to use school and university computers in seconds! Never have to worry about being held back from job opportunities again!, NVDA takes the financial barriers away from your chances of getting a job. Easily pay bills and manage your banking, do online shopping, order groceries and so much more.

References

1. https://www.nvaccess.org/about-nvda/Access date on 16/11/2023
2. V.Carrega, Open Source tools for visually impaired people, Master Theis, Università di Genova(2006), in Italian.
3. F. Felletti, Text-to-speech technologies applied to website navigation, Master Thesis, Universitàdi Ferrara (2004), in Italian.
4. T.Dutoit, V.Pagel, N.Pierret, F.Bataille, O.Van Der Vrecken The MBROLA Project: Towards aSet of High-Quality Speech Synthesizers Free of Use for Non-Commercial Purposes, in: Proc.ICSLP'96, Philadelphia, vol. 3 (1996)pp. 1393-1396.
5. P.Cosi, R.Gretter and F.Tesser, Festival speaks Italian, in: Proceedings of GFS2000, Padova(2000), in Italian.
6. Blind + Linux = BLINUX, (February 23, 2007) http://leb.net/blinux/
7. R.A.J. Clark, K. Richmond, and S. King, Festival 2 - build your own general purpose unitselection speech synthesiser, in: Proc. 5th ISCA workshop on speech synthesis (2004).
8. Speech Dispatcher, (February 23, 2007) http://www.freebsoft.org/ speechd
9. ImageJ, Image Processing and Analysis in Java, (February 23, 2007) http://rsb.info.nih.gov/ij/

10. J. Canny, A Computational Approach to Edge Detection, IEEE Transactions on PatternAnalysis and Machine Intelligence, vol. 8, no. 6 (1986) pp. 679-698.