E-Learning for the Visually Impaired

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Abstract- In this world full of technology, e-Learning plays an important role in the educational field worldwide. Where the whole world tries to adapt to these continuously growing technology, the people with disabilities are bereft of it. There were many attempts of develop an e-Learning website for the visually impaired people. However, there were many drawbacks which made the whole learning process complex for the visually impaired. One of the major problems with all these systems was navigation. The visually impaired students could not navigate from one chapter to another or from one page to another. Also all these systems were online systems. Accessing the system in the absence of internet was impossible. The Daisy software is the solution to this problem of navigation. Developing a System on which the user can work very well offline and needs to go online only when the system needs to be updated is also one of the major goals to be achieved to build an elearning website for the visually impaired.

Keywords-Navigation,mp3, xml.

1. INTRODUCTION

E-learning has the potential to progress people with disabilities from the outer edges of educational opportunities to the leading edge of educational innovation.

This report focuses on issues relating to elearning and blindness. It is recognized that there may be issues and difficulties for a range of people with or without other disabilities, but there are specific problems for those who cannot access elearning visually. It may be more difficult for learners who are blind to engage in many activities including those connected with education. One difficulty may be that it may take longer for a blind person to carry out a task than a sighted person.

The introduction sets out the report problem, the aims of the research, key terminology and an outline of the report. The report is based on an initial belief that it is more difficult for learners who are blind than sighted learners to engage in elearning and therefore they are at a disadvantage in terms of education and training.

Using software technologies like the Daisy software and Django webframe along with the SQLite. The Daisy software can be used in applications like "talking books" .Django webframe helps in creating reusable and user friendly templates.

2. BACKGROUND AND MOTIVATION

Initially almost all the visually impaired students were bereft of the modern technology. Later they were introduced to this concept of 'Computers'. But this also then had many drawbacks because of which the students were not comfortable working with computer. The system that we are designing meets this requirement of the users and helps themcomfortably use the system. One such noticeable drawback of the existing system was improper navigation of pages. This problem has also been taken care of by us in our project.

3. PROBLEM STATEMENT

The need of the project is to study and analyses certain issues in blind education, which need further attention. And some methods have been implemented to make E-learning for blind more effective in order to utilize its full potential and serve the objective of introducing the visually impaired with the modern technology in their learning process.

Visually impaired persons are difficult to read printed books. Braille libraries have audio books as well as braille books, to give chances for visually impaired persons to read books. These audio books were made based on printed books, byrecording reading them aloud. However, most of them wererecorded into cassette tapes in several years ago. These tapeshave been degraded and replacements are needed.In recent years, digital technologies are evolved in audioapplications. Digital acoustic sounds have enabled highquality durable recording. Compact discs, solid state audioplayers, and multimedia applications on personal computersenable random access to the audio contents, not sequentialaccess as with tapes. Audio books in digital audio data withsome content structures, mainly for visually impaired personsare called as digital talking books, in abbreviation of DTB.

4. **REVIEW OF LITERATURE**

The E-learning system has been into practical use since long time and thus the problems and the security threats are well familiar with the users and the designers. However E-Learning for the visually impaired people is a new concept. There is a decent study done on this topic and also a good amount of research and development has been done under this topic. Below given the various technologies reviewed.

A. A Development of the Online Audio Streaming Recorder for blind Learner

Blind people are human beings; therefore, they have human rights to access education, facilities, and technology. Studies show that blind persons in UK and US increased their experiences and skills because they have the chance to access education and facilities. These people are independent because they have good jobs, take care themselves, and take responsibility their family. They can do this, for they have more experience and high occupation skills, that they can earn enough money. Blind persons should have opportunities like those who are normal persons. This will be benefiting not only blind persons themselves but also their families and country.

Contextually, the majorities of the blind are ignored and cannot access technology and facilities. Today, the Internet technology is an impotent tool to develop innovation has researchers rethink the way to develop innovation to user. Internet-based communication creates a variety of ways to deliver and provide electronic resources for user. Some methods, such as using web pages to deliver text in much the same way as hard bound texts, are very familiar to user. However, a big advantage is that the Internet also supports the delivery and use of multimedia elements, such as and interactive hypermedia. sound. video. Curriculum, administration, and assessment are all affected as members of the educational community experience changes in communication and commerce that are a result of the explosive expansion of the Internet.

Internet technology can provide flexibility and convenience. It can overcome some traditional barriers such as time and place. A user can access materials independently online. For the general user occupying an increasingly large percentage of population, and with greater numbers of people having computer and Internet experience, opportunities are being made to better meet their needs, interests, and work schedules through online system. Internet technology does not require extensive computer skills, although familiarity with computers and software (especially Web browsers) does help to reduce the intimidation factor.

B. Daisy 3: A Standard for Accessible Multimedia Books

Accessible The Information Digital System(Daisy) standard describes an open data formatfor the representation of interactive books thatare accessible to those with printrelateddisabilities.Daisy books may have both atextual and an audio component and allow foran active reading experience. To read a Daisybook, a reader needs a hardware or softwareplayback system. Unlike a book on a cassettetape that users typically listen to from start tofinish, readers using a Daisy book player caneasily move backward and forward in thebook; they can move to chapters, sections, pages, or bookmarks they have created. If resumes reading, thereader the player beginsplayback where the reader left off. Someplayers allow readers to change the magnification and the colors used. Many such playersalso highlight what is being spoken.

One of the problems that Daisy books are particularly good at solving is image translation. For example, in technical textbooks and journals, equations, diagrams, graphs, and other imageoriented material often accompany the text. These images are not immediately accessible to blind people. For those with limited vision, images can cause problems because they often don't look clear when magnified. And for those with cognitive disabilities, cluttered images or complicated ordering within the image might hinder understanding. Some images can be made accessible by providing a textual description of the However, for many scientific or image. mathematical images, this summary information doesn't help readers understand an image's structure and relationships. Daisy books can solve this problem by using structured markup instead of image. For mathematical expressions, an Mathematical Markup Language (MathML)4 can represent the expressions; for diagrams and graphs, Scalable Vector Graphics (SVG)5 can be used. These formats let users navigate the images, hear them as spoken words, or convert them to other formats, such as braille or tactile displays.

C. Development Of A Web Accessibility Model For Visually-Impaired Students On Elearning Websites

ELearning websites is the advance developed tool in the twenty-first century which will generate new era of education under the concept of anyone can study in anywhere at any time. According to , since the middle of the 1990s, the number of colleges and universities which have provided courses and degree programs via eLearning mode has been growing dramatically. Meanwhile, according to Royal College for the Blind (2002), eLearning via the Internet is well enable visually impaired students to access more materials and work more independently than they could using traditional method. However, most online educational environments were still not accessible to students with disabilities, together with the information and activities posted were not appropriately accessible with adaptive technology used by general visuallyimpaired students . As a result, all eLearning websites should be focused on the issue of web accessibility to facilitate visually impaired students to effectively access. In reality, there are several components required to create web accessibility to Facilitate this group of users. Therefore, this paper should be proposed to investigate existing concepts and tools of web accessibility for eLearning, and to develop the web accessibility model support visually-impaired students to operate on eLearning websites.

5. PROPOSED SYSTEM

The user input is taken, that is, the user records the audio file using the human recorder or synthetic recorder. If the xml file for that input is not available it will create else it will update. The user clicks the desired chapter and a tag is created and a corresponding mark is created in an mp3 file. For every book there can be more than one mp3 file depending upon the user's selection. For example, if the user says one mp3 file for one chapter, there can be as many mp3 files as many number of chapters. After recording, user takes the file, that is the book. The book will be an archive (eg.tar file, rar file, etc). The software will open the book, reads the xml file and puts set of elements on screen which are basically the contents. The user clicks one of the item. Software checks whether such an element exists in the xml file if yes user seeks the marker and puts it in the particular place in the mp3 file and starts reading it.

With the Django Web frame, we can create many user friendly web pages for the blind users. The user first visits the homepage where user will be guided through all the shortcut keys, that is, the navigation control shortcuts. The next web page will be the choice of the subject. Whenever the subject of user's choice is chosen the next page is the page requesting for the name of the subject. The same process continues till you reach one particular chapter.

Web page 1:



Fig 1: Web Page Block diagram

The main task completed with the help of SQLite is designing the database. The database mainly consist of xml and mp3 files. The paths for the database can be linked in this way.

6. CONCLUSION

The E-learning system for the visually impaired consists of two primary modules. The idea of providing users with navigation where they can move from one page to other chapter to other has been realized. The next part is to provide access to this system offline, that is, the user should be able to use the system without the presence of the internet.

The concept of E-learning for the blind will help solve many problems where students may need some arbitrary configurations. As this system will provide the users with a navigation facility ease of their learning process is assured. We aim to build a customized application which would focus on all the primary needs of the visually impaired students such as simple functioning, easy understanding and clear audios. The goal is to make use of efficient and time saving algorithms for the same.

In future, we can work on translating devnagri script into audio and further other languages too.

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