ABSTRACT

This research focuses on determining the social, affordability, and accessibility problems and issues faced by vision-impaired on accessing personal computers, mobile technologies, Internet, and web-related technologies to reduce disability digital divide associated with visually impaired community. It investigates the issues associated with their current practices to develop a best practice framework to overcome the digital divide in Sri Lanka.

The research based on positivism and interpretivism mechanisms. A naturalistic approach used in conducting interviews and observations to identify problems and issues related to disability digital divide. Data were collected using survey data and literature survey to achieve the research objectives, which was further analysed based on the thematic analysis method, to identify the problems. The analysed data were further categorised into four themes to determine the solutions to overcome the disability digital divide. They include financial affordability requirements, promoting the use of open-source free software, awareness, and training programmes. This framework is proposed for stake holders including website developers, designers to practice in website designing, developing, and testing stages in the web and mobile system development life cycle, This framework is further validated with using expert opinions, experimental observations, and pre- and post-validations through the prototype version of the website and mobile application.

Findings indicate that higher costs of mobile and data packages exceptionally unaffordable due to the low-income levels because of visual impairment. In the context of employment aspects, employers are reluctant to select visually impaired people. The reason was that most new digitally-enabled working environment demands additional costs for installing screen reading software in the office computers. An extra cost is also involved to rearrange and specially train the visually impaired individuals to work with modern digital workplaces.

According to the framework validations, highly influencing factors that help to overcome the indicated issues are increase affordability of computers, mobile devices and other IT equipment, promoting and training for open-source software, conducting awareness and training programmes on other modern and useful software applications, and offering some vital troubleshooting training are helpful.

Other significant factors are, ensuring a keyboard-friendly websites, confirming that all content is easily accessible and support with semantic annotation, and adding alternative text for images. Furthermore, use headers to structure the content correctly, design all forms to support accessibility, do not use tables for anything except tabular data, enable resizable text that does not break a website, avoid automatic media and navigation, create content with accessibility, and use the appropriate font and colour combination for the visually impaired community. Pre-recorded video with the audio facilities must be considered, but in the braille support in web, the designing option has no significant impact on visually impaired web users. Introducing a rating widget option to a website identifies the level of accessibility features availability facilitates, thereby overcoming the disability digital divide.The results further conclude that a significant difference exists in websites, with and without the involvement of the visually impaired community. Semantic web and semantic annotations of the context of page elements, content serialisation, and navigation by special keyboard commands are also highly influencing the effective use of the web and increase the satisfaction level in the website accessing process.

Finally, the study identified that in the context of information accessibility, a strong framework is essential to overcome the disability digital divide, which must be provided to national policy-making authorities and the web and mobile application designers and developers. Increasing the affordability facilities, promote more open-source software among the visually impaired community, and arrange continuous seminars and workshops via the ICT Agency of Sri Lanka and Internet Society of Sri Lanka are some other necessities. Finally, it is recommended to develop a national level web and mobile guidelines to be followed by web and mobile application developers for the benefit of the visually impaired community.

Keywords: Digital Divide, Web Accessibility, Visually Impaired, Mobile Accessibility, Disability Digital Divide