

# Challenges to Enhancing Web Accessibility in Saudi University Websites: An Exploratory Study

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**Abstract**—This paper aims to provide an exploratory study of challenges in enhancing web accessibility faced by web developers of the Arabic language version of university websites in Saudi Arabia. The number of challenges encountered were wide ranging from a lack of accessibility knowledge and negative attitude upon disability issues. In the light of the study findings, this paper presents some recommendations for improving the accessibility status in Saudi university websites.

**Keywords**- *web accessibility; Saudi Arabia; disability; challenges; university websites.*

## I. INTRODUCTION

The number of government universities in Saudi Arabia has increased dramatically in the last two decades from 7 to 28 [1]. As a result the number of their websites has also increased without any clear guidelines in place regarding accessibility, which may hinder some users from benefiting from their content. University websites in Saudi Arabia are in need to address the barriers that might exclude people with special needs from participation in online educational, social and professional activities [2].

Although 65.9% of the population of Saudi Arabia uses the Internet [3], web accessibility has remained a problematic issue for Arabic websites in terms of the accurate assessment of whether those with disabilities are able to enjoy their use on equal terms with their non-disabled peers.

Over 700,000 people with disabilities live in Saudi Arabia which represented around 8% of its citizens in 2015 [4]. Among them, are those interested in or who need to access university websites, for example prospective students, undergraduate students or those pursuing lifelong courses. With a low level of web accessibility the number of people excluded from obtaining the benefits of accessing university websites would definitely increase. This is an important issue to be taken into account when developing websites, services and content.

Therefore, this paper contributes to this area by exploring the challenges in designing and developing accessible university websites in Saudi Arabia. A better understanding of these challenges would help to inform suggestions and solutions for improving access. The contribution of this research will be to enhance the accessibility of university websites in Saudi Arabia.

The rest of this paper is organised as follows. Section II describes studies on accessibility of Saudi websites. Section III presents the research methodology. Section IV presents the results. Section V discusses the results and Section VI concludes the paper.

## II. RELEVANT STUDIES

Based on a literature review and to the best of the researchers' knowledge, limited work has been reported on identifying the challenges of designing and developing accessible Arabic language university websites in Saudi Arabia. The study conducted by [2] was the only one found to evaluate the accessibility of university websites in Saudi Arabia, however, it focuses on the English version of these websites not the Arabic one. A few studies, however, have been conducted to evaluate the accessibility of websites in Saudi Arabia. The very first study in this regard was conducted to evaluate the accessibility of e-government websites in Saudi Arabia and Oman [5]. One of the stages of this study was to survey the webmasters of the e-government websites to explore the reasons behind the lack of accessibility in their websites. Since then, there has been limited research to assess web accessibility of Saudi websites, such as [2], [6]-[10]. Generally, there has been strong agreement regarding the poor accessibility of the examined websites and a lack of awareness of its importance. The main violations found were: text alternatives for non-text content, no keyboard accessibility, compatibility and no identification of the language. Moreover, it was reported that a number of accessibility evaluation tools have raised a problem since they do not recognise Arabic language.

Although each of these studies has its significant impact and contribution on accessibility of Saudi websites, it can be seen that little work has been conducted in identifying the challenges of designing and developing accessible Arabic websites in general and university websites in particular. In the USA, for example, there have been studies to explore the same perspective, such as [14] and [15]. Therefore, and to contribute towards this issue, we present our exploration of such challenges in terms of design and development of accessible university websites in Saudi Arabia.

## III. RESEARCH METHODOLOGY

Usually, interviews are used to conduct an exploratory study. The interview research method was chosen here

because it enables in-depth discussion and exploration. Experts were chosen for interview at this exploratory stage to ensure the findings would have more credibility than those from a sample of non-experts [16]. When recruiting experts, the choice is based on their knowledge and experience in the area being studied. Therefore, in this type of sampling, sample size depends on saturation, which can be reached when no new knowledge or information can be gathered [17]. Based on the above recommendations, in this study, 15 experts from various Saudi universities were interviewed. Since this paper concerns the perspective of web developers on challenges faced when improving accessibility of university websites, a person was considered an expert if they had at least two years' experience of university website development in Saudi Arabia or were Saudi university researchers with at least two published papers in this area of research.

An invitation was sent by email that requested experts' participation. After sending the invitation emails to the experts, 15 of them from 9 universities responded by agreeing to participate and informed us of their preferred method of communication. The interviews were conducted face-to-face, over the phone and online, according to the availability and location of each expert. Most of the experts (12) were developers or designers, and the remaining three were researchers in the area of web accessibility. Moreover, 60% are from long-established universities and the remainder is from newly emerging universities.

In each interview, the expert was presented with a consent form to sign and then given a brief explanation of the study. After that, open ended questions regarding their opinions on accessibility of their websites and challenges they faced in enhancing their accessibility were asked and the responses audio recorded by the researcher, after obtaining permission.

All the interviews were conducted in Arabic and audio recorded, then transcribed. Afterwards, the transcripts were translated from Arabic to English by a professional bilingual native Arabic translator. Different techniques including back-translation and bilingual committee approach suggested by [18] and [19] were followed in this study. The Arabic version was then checked by three bilingual PhD students in Electronics and Computer Science and Linguistics at the University of Southampton. Upon a satisfactory review, the Arabic version was back translated into English by another translator. The final copy was compared to the original transcripts to check validity of the translation. Minor variations were detected but did not alter meanings.

To analyse experts' responses to the interview questions the interviews were transcribed and saved into NVivo. NVivo is a software tool used to manage and understand textual data, and allow for in depth analysis. Experts' responses were tagged using NVivo according to analysis themes, collected together into groups and then synthesised.

#### IV. CHALLENGES TO ENHANCING WEB ACCESSIBILITY IN SAUDI UNIVERSITY WEBSITES

Experts were asked to identify challenges they face (or may face) in enhancing the accessibility of university websites. After qualitative content analysis of the question responses, Figure 1 was constructed to show the challenges and the percentage of experts who pointed out the challenges. The challenges were as follows:

##### A. Negative Attitude Toward People with Disability

It is clear from Figure 1 that the main challenge admitted by the experts was the negative attitude toward people with disability. This attitude was reflected by university websites and web developers, as they are part of society. Therefore, people with disabilities are usually neglected when designing university websites in Saudi Arabia as explained by **Expert C**:

*"When we develop the website, we do not think of users with different abilities or special needs at all. I think this needs to be changed not only in terms of developing accessible website but also in all aspects of our lives."*

##### B. Lack of Guidelines for University Websites in Saudi Arabia

The experts mentioned the need for guidelines for all aspects of the websites including the accessibility, usability and organisation of web pages, especially the home page, and consistency in the layout across all Saudi university websites. Responses from all experts indicated that no guidelines, either international or local, were used for web accessibility.

**Expert C** stated:

*"The focus is on different issues such as aesthetic and security of the website. No attention has been paid to accessibility issues."*

**Expert D** added:

*"No accessibility guidelines are followed at all. What our boss asks us to do is copying what other local and international universities do in their websites."*

**Expert G** explained:

*"No specific web accessibility guidelines are used in our website. We are connected to a website for evaluating university websites (www.webometrics.info). It puts different criteria for the evaluation process and being accessible is not one of these criteria. In addition, our university is an emerging university established five years ago. The population in our region and university students are low compared to other long-established universities. Consequently, university members with special needs are extremely low."*

**Expert H, I and M** mentioned that although they do not follow any web accessibility guidelines, they are at least committed to consistency across their website by applying a single theme to all its pages.

##### C. Lack of Training for Developers

Around 60% of the experts have pointed out that the third challenge was the lack of training for developers. This has an

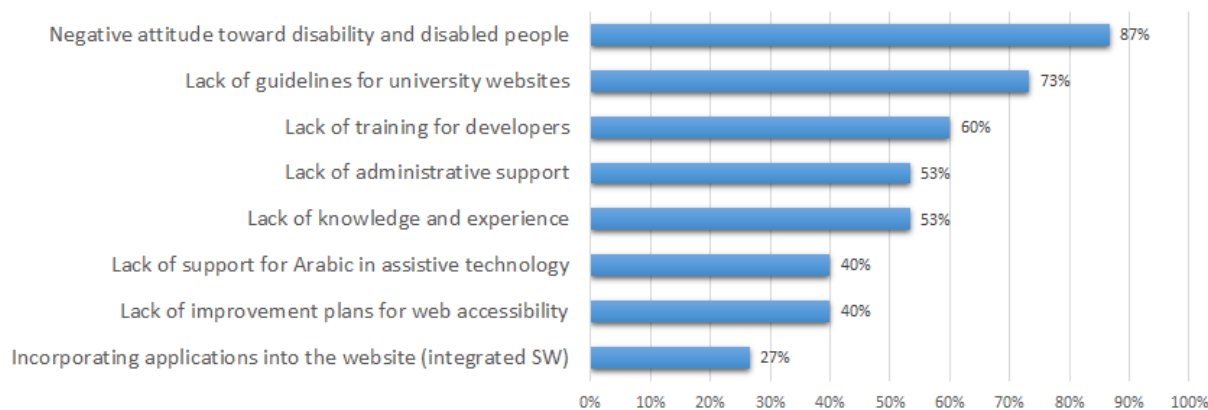


Figure 1 Challenges to Enhancing Web Accessibility Identified by Web Developers of Saudi University Websites

impact on the development of their skills and adaptation to new technologies and techniques.

#### D. Lack of Knowledge and Experience

The fourth challenge was the lack of knowledge and experience regarding web accessibility, as experts face difficulties when looking for resources they need in Arabic. As stated by **Expert L**:

*"Due to difficulties to find technical resources in Arabic, we tend to limit ourselves to what we can find in Arabic."*

#### E. Lack of Administrative Support

Around 53% of the experts cited the lack of support from their bosses as one of their challenges. For example, **Expert D** stated:

*"My boss does not want me to produce accessible web elements such as, text alternative for images."*

#### F. Lack of Improvement Plans for Web Accessibility

Lack of plans for improvement of university websites was another challenge. **Expert H** mentioned:

*"It is not easy to introduce web accessibility in a university website, therefore a clear and realistic improvement plan is needed."*

#### G. Lack of Support for Arabic in Assistive Technology

Lack of support for the Arabic language in assistive technology was an issue raised by 40% of the experts. They claimed that in Arabic they do not work, as well as in languages, such as English. Despite the accessibility techniques provided on websites, assistive technology would hinder disabled users from accessing the website. An example was given by **Expert E** for the poor performance of Arabic screen readers, which affects the experience of the blind people who use them. **Expert M** agreed on this matter and added:

*"An Arabic screen reader was added in some of the pages of our website, but the quality of reading is much lower than it should be."*

#### H. Incorporating Applications into the Website (Integrated SW)

The last challenge, identified by around 27% of the experts, was integrating software applications into a website. The poor level of accessibility of some of these applications would have an influence on the whole website.

### V. DISCUSSION

From the previous findings, it is apparent that the requirements of disabled people are largely ignored when developing university websites in Saudi Arabia. Different challenges and obstacles which contribute to this problem and hinder the implementing of accessibility have been identified by researchers and web developers in these universities. In general, these challenges vary as they concern different issues, such as awareness, technical and administrative issues.

A number of studies have discussed disability in Saudi Arabia, such as [11] and [12]. They have reported the negative attitude of the community toward people with disability as a challenge in conducting research involving the disabled or improving services for them. Our findings agreed with this aspect since around 87% of the experts cited this issue as a main challenge in enhancing web accessibility. As reported in [13], the main reason for negative attitudes is the lack of knowledge about those with disabilities which could be improved by an increased level of knowledge and education about disability issues.

Lack of guidelines for university websites in general and accessibility issues in particular is another obstacle that needs to be addressed by developing guidelines appropriate for university websites in Saudi Arabia and/or adapting the existing web accessibility guidelines to the local context. In addition, legal enforcement by decision makers to follow the guidelines in these universities is needed.

Other issues regarding lack of training, knowledge and experience show a pressing need to raise the developers' skills by training them on up to date technologies. Moreover, technical Arabic resources need to be enriched by translating the resources into foreign languages. Lack of knowledge was a common finding between the current study and [15].

Lack of training was also pointed out as a challenge faced by web developers and webmasters in the USA [14].

It is obvious that the lack of awareness about web accessibility and its importance comes from the administrative level which adds to accessibility problems. Spreading awareness about this issue should start from the managers who then can spread it to their developers. Lack of managerial support was also an issue for American webmasters as discussed in [14].

Lack of improvement plans was another challenge that needs to be overcome by developing strategic, stepwise and realistic plans for adoption of web accessibility. In addition, more work in the area of assistive technology is needed to support Arabic language as most of the technologies do not satisfy their users. The investigation of the accessibility of integrated applications is another issue that would be resolved by early investigation before integration into a website.

Accessibility of integrated applications is another issue that would be resolved by investigating them before integrating them into the website.

We note that lack of time and budget was revealed as a finding from [14] and [15]; however, it was not revealed as an obstacle in this study. This indicates that the financial and time resources are available and would help improve the accessibility situation.

## VI. CONCLUSION

In this exploratory study, a number of challenges and obstacles in enhancing the accessibility of university websites in Saudi Arabia have been identified by web designers and developers in these universities. A number of them were found similar to findings from other studies investigating the perspective of web developers. They are: lack of training and lack of managerial support.

Similar to any other exploratory study, this study has some limitations. These include the number of experts involved in the study (15 experts) and their spread across government universities in the Kingdom (9 universities). Further in-depth research is necessary by recruiting participants from all government and private universities which might lead to reveal further accessibility challenges.

In order to enhance the accessibility in Saudi university websites, the identified challenges and obstacles in this study need to be overcome. The successful implementation of accessibility of university websites would allow people with disabilities and special needs to be involved in more activities as are their nondisabled peers and to benefit from the services offered by these websites.

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