iOS Mobile Application Accessibility Assessment

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Abstract— **Improving mobile accessibility has been an ongoing topic for decades. While more developers are aware of the importance of web accessibility, application accessibility remain neglected because of the hard-to-track dynamic. Although there are guidelines that help developers to build more accessible applications, it is difficult to get information of the accessibility fluidity for general application market. In order to provide a more structured guideline and assessing method, we composed questionnaires that ask for specific questions and generated reports for the most popular applications. With the goal of creating a review system via crowd-sourcing, we developed the criteria for assessment and methods of reporting.**

Keywords: mobile accessibility; app accessibility; accessibility assessment

I. INTRODUCTION

Mobile accessibility concerns the effort of making mobile devices accessible to people with disabilities. Despite the various guidelines that address common problems and list out essential components to create accessible technology, software developers often dismiss important accessibility features due to various reasons, including ignorance and misunderstanding. Moreover, existing assessment tools for web and application accessibility could only check for missing information and page layout without reflecting how the well the application could perform the core functions using accessibility services.

Applications developed in iOS environment provide various accessibility services. This study focused on assessing the performance of VoiceOver and Switch Control. VoiceOver is a gesture-based screen reader, which enables users with vision disabilities to hear descriptions on the screen. Switch Control lets users with mobility issues to control their phones with a single switch or multiple switches. The results of the study only concerned these two accessibility services.

The study provided a method of collecting for accessibility services assessments and developed a report template that could accurately reflect the level of accessibility of an application. The report would help users, especially users with disabilities, to better evaluate the functionality of the application. By integrating more assessment data through crowd-sourcing, the accuracy of the report would improve over time.

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II. BACKGROUND

The importance of web accessibility has been stressed for a while. In the meantime, few work has been done on mobile applications, especially on iOS applications. The assessment and criteria for mobile application accessibility is more obscure because applications contain a nonlinear data dynamic that is hard to track. As a result, limited information are provided for people with disabilities regarding accessibility services performance. Previous studies that assess applications were also confined to a specific area, mostly health-related, dismissing the general application market that serve a larger population.

III. METHODS

Participants in this study were students currently working in the Taskar Center for Accessible Technology. A participant was provided with a questionnaire for each iOS application. The questionnaire was presented in the form of a Google form. It consisted of questions regarding the application, as well as questions about each view of the functions assessed.

The selected set of the most popular iOS applications from different categories were presented to be assessed. The questionnaire asked the participants to pick three core functions of the application and use both the VoiceOver and the Switch Control to perform the core tasks. The features that need to be assessed include scannability, structure, hierarchy, use of widget, and cognitive difficulty.

The questions asked were specific and targeted at corresponding issues that often layout in a mobile application. Each view (a screen of elements) was viewed and a screenshot was recorded. Answers were gathered in a Google spreadsheet to be analyzed and ready to generate the report later.

The assessment intended to track down accessibility issues for both laymen users and software developers. It focused not only on the reasonability of the structure and layout on the screen, but also on the functionality and usability of the application. The primary goal of an application should be provide complete accessibility fluidity according to the criteria of the report.

IV. RESULTS

In this study, 12 iOS applications were assessed using the questionnaire provided. This yield data for all of the trials, giving us a detailed view into the faults and errors. Thus there are a number of facets to examine when analyzing the assessment performance, with the following being just a few:

- Clarity: The participants reported that they cannot understand some of the questions in the Google form.

They used words like confusing to describe questions about hierarchy and structure specifically, indicating that more explanations should be added to the questionnaire.

- Functionality: Some of the applications showed a clear of lack of functionality when using with accessibility services. Applications that focus on images and icons showed this problem most obviously. The images were not recognized as scannable and the users were often stuck in the same view or unable to perform any meaningful task.
- Consistency: The participant did not always use the same criteria when assessing views of an application. This situation created complications as a definite data could not be obtained. A potential solution would be to combine assessment data from multiple users and generate a final result via a scaling system.
- Accessibility Fluidity: Few applications could be used interchangeably with accessibility services. The accessibility fluidity level is low in general.

Using different images and charts to present the information, the report should be easy and clear for both general public and developers who want to improve the accessibility of their applications.

V. Future Work

The current study started the process of assessing. In the future, more assessment could be made via crowd sourcing to further testing the usability of the report. With the increased number and variety of users, we will see a clear pattern of what the accessibility services in iOS mobile applications lack. The report will then provide a more sophisticated guideline for developers.

Furthermore, this study focuses on the functionality of iOS applications. We will compare and contrast the performance Android applications with the same system of assessing. By including both development environment, the difference between open source and proprietary software regarding accessibility services could be detect. The result would enhance our understanding of the methods for improving mobile accessibility in general.

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