myAccessTools Development for Novice Raters to Accurately Assess Accessibility of Buildings

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ABSTRACT

Introduction: The AccessTools accessibility application from the AccessRatings for Buildings (ARB) project currently requires users to possess knowledge of building accessibility to accurately evaluate restaurants. Because not all potential users of AccessTools have prior knowledge regarding restaurant accessibility, the myAccessTools app was developed. Methods: The myAccessTools taxonomy was split into two sections, functions and features. Function items were created to examine if particular occupations are required to utilize building features. The feature items in the assessment investigated what building elements existed in the restaurant. Each portion was based off the AccessTools taxonomy. New descriptions were formulated and scoring label changes were implemented to simplify the utilization of the assessment for users. Results: A prototype of the myAccessTools app was successfully created with a new taxonomy and altered scoring options. Discussion: Despite the creation of a functioning myAccessTools prototype, further testing needs to be conducting to validate myAccessTools' use as a form of assistive technology that is beneficial in assessing the accessibility of restaurants for people with disabilities (PWD). Conclusion: The myAccessTools application has the potential to be an accurate measurement of restaurant accessibility with increased efficacy in use compared to AccessTools.

INTRODUCTION

To decrease discrimination encountered by PWD, the United State government passed the American with Disabilities Act (ADA) and the ADA Standards for Accessible Design in 1990 and 2010, respectively [1,2]. Although, despite these legislations being passed, PWD still encountered environmental barriers due to buildings meeting numeric standards rather than fulfilling occupational functionality [3]. Furthermore, buildings constructed before 1990 are not required to meet ADA regulations unless being modeled [4]. Because of this, buildings or restaurants can be labeled as "accessible", while still being inaccessible for many individuals. This can create frustration for PWD when they arrive at a restaurant only to discover they cannot access the building or features it possesses and may influence PWD to avoid the community [5]. The Rehabilitation Research Design & Disability (R_2D_2) Center at the University of Wisconsin-Milwaukee conducted interviews with PWD as part of the National Scientific Foundation's I-Corp program and discovered PWD would find information about a restaurant's accessibility beneficial [6]. The ARB project, which assesses restaurant accessibility and displays the information, was proposed as a solution to provide PWD accessibility information for restaurants with the intention PWD would use this knowledge to determine if a restaurant was accessible for them prior to visiting the establishment.

ARB

The AccessRatings for Buildings project is a suite of iOS assessment applications that rate and display the accessibility of restaurants to promote community participation (Figure 1). ARB primarily emphasizes functionality and employs a Person-Environment-Occupation (PEO) framework. The project utilizes comprehensive, detailed evaluations completed for AccessTools and convenient, brief assessments for AccessPlace. Both AccessTools and AccessPlace use a Trichotomous Tailored Sub-Branching Scoring (TTSS) system that leads users to additional questions to gather more information based on their response [7].

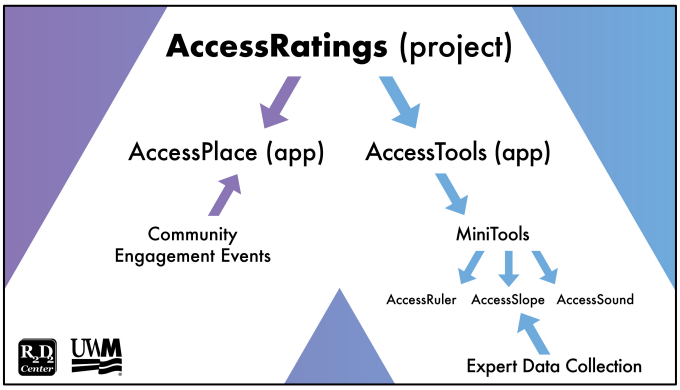

Figure 1. AccessRatings for Buildings (ARB) Flowchart

myAccessTools

The myAccessTools app is a revision of the AccessTools app that required prior accessibility knowledge and training to complete evaluations accurately. myAccessTools is building assessment tool that is comprised of two sections, functions and features. The functions section establishes what occupations are required by an individual to use a building feature. The feature section examines what features are present at a restaurant. Having these two sections reinforces the PEO framework used by ARB as the individual rating represents the “Person”, the feature is the “Environment” portion, and the function is the “Occupation”. Both sections provide item descriptions that guide the assessor in what is being evaluated so they may give it an accurate score. In addition, the scoring options range from Yes [2], Maybe/Unsure [1] and No [0] and a total accessibility score is provided at the completion of the evaluation. myAccessTools also offer users the ability to include measurements taken during the evaluation by utilizing the MiniTools within the assessment. These MiniTools are AccessRuler, AccessSlope and AccessSound and each collects data using the measurements systems within the iOS device. myAccessTools also allows users to attach photographs and video recordings of items to their assessments as well.

METHODS

The myAccessTools was developed in five stages, create of a taxonomy, scoring changes, prototype development, testing the prototype, finalizing prototype. The first stage of creating a taxonomy was completed by taking items from the original AccessTools taxonomy and breaking those items up into the functions required and the features themselves (Figure 2). Following that, item descriptions need to be formulated in a clear and concise format that explained what the user should be assessing on each item. The second stage was implementing scoring label changes. The buttons were relabeled with Yes [2], Maybe/Unsure [1] and No [0], which provided the user with basic options when scoring items. The third stage was prototype development, which included uploading the completed taxonomy with scoring updates to the application, thus creating the first prototype of myAccessTools. The fourth stage was dispersing myAccessTools to testers to examine functionality, scoring, and user interface with testers reported errors and app developers fixing the issues. The fifth stage was finalizing the first myAccessTools prototype.

Main Entrance/Exterior Doorway(s)						In this section you will determi	2,""	1,"Begin"	0,""
	Main Entrance Level Changes					Traverse level changes.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
		Small Level Changes				Traverse level changes that ren	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Steps			Traverse steps.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Ramps			Traverse ramps.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
				Rest on ramp		Rest mid ramp due to length a	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Elevators			Use elevator.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Other Alternatives to Steps			Traverse other element (e.g. es	2,"Yes"	1,"Maybe / Unsure"	0,"No"
		Large Level Changes				Traverse level changes that ch	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Staircases			Traverse staircases.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Elevators			Traverse Elevator.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Ramps			Traverse ramp.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
				Rest on ramp		Rest mid ramp due to length a	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Other Alternatives to Staircas			Traverse other element (e.g. es	2,"Yes"	1,"Maybe / Unsure"	0,"No"
	Doorway					Traverse a doorway.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
		Door				Manually operate a door (e.g.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Door handle			Manipulate door handle (e.g. t	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Door lock			Lock and unlock door.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
Indoor Routes						In this section you will determi	2,""	1,"Begin"	0,""
	Route to Seating					Route in building that leads to	2,"Yes"	1,"Maybe / Unsure"	0,"No"
		Level Changes in Route to Seating				Traverse level changes.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
			Small Level Changes			Traverse level changes that ren	2,"Yes"	1,"Maybe / Unsure"	0,"No"
				Steps		Traverse steps.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
				Ramps		Traverse ramps.	2,"Yes"	1,"Maybe / Unsure"	0,"No"
					Rest on ram	Rest mid ramp due to length a	2,"Yes"	1,"Maybe / Unsure"	0,"No"
				Elevators		Use elevator.	2,"Yes"	1,"Maybe / Unsure"	0,"No"

Figure 2: myAccessTools Taxonomy

RESULTS

A functional myAccessTools protype (Figure3) was developed by the R_2D_2 Center at UW-Milwaukee. The app consists of a total of 2,915 items divvied between two sections, functions and features. The functions portion contains 120 items, and the features group contains 2,795 items. Both function and feature sections each consist of four elements: Health Safety Measures, Main Entrance(s)/Exterior Doorway(s), Indoor Routes and

Restroom(s). Health Safety Measures has 58 items and Main Entrances(s)/Exterior Doorway(s) possesses 413 items. The total number of items for Indoor Routes is 1,817 and Restroom(s) has 627 items. Each item consists of a formulated item description that is clear enough for all users to accurately rate items and possess the Yes, Maybe/Unsure and No scoring options.

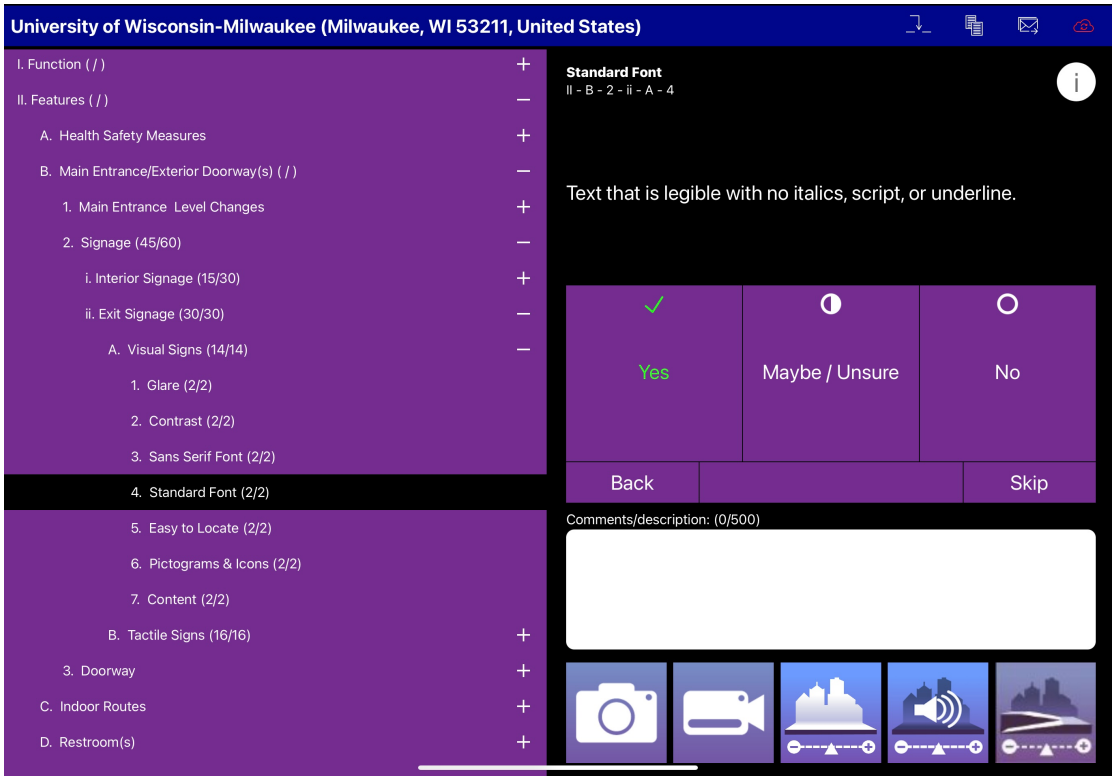

Figure 3: myAccessTools Prototype

DISCUSSION

While development of a functional myAccessTools prototype was successful, further advancement regarding the scoring should be investigated and improved. The other six items in the AccessTools taxonomy need to be added to have a comprehensive building assessment. Also, features that are inaccessible, but present, such as level changes are currently scored and contributing to a more favorable overall score. In the future, to balance this effect out, matrices for 14 impairments would be completed. These matrices would weigh each item for every impairment and assign it a value. Then score for each impairment would be available on the reports page in the app and individuals with specific impairments could view scores that are applicable. In addition, if an individual has more than one impairment, an option to select multiple would be available and average the scores together.

CONCLUSION

The myAccessTools prototype has the potential to be an accurate measurement tool of restaurant accessibility with further development. With expanding the possible user pool by allowing individuals without accessibility and disability knowledge to complete assessments, more users should be able to effectively rate restaurants and increase the number of buildings assessed. This would add to the ARB database that provides those results for PWD and provide them with more accessibility information for restaurants.

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this work does not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.

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