Work ACCESS: The development of workplace accommodation decision trees

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INTRODUCTION

Workplace accommodations are defined as “any change in the work environment or in the way things are customarily done that enables an individual with a disability to enjoy equal employment opportunities” (EEOC, 1992) [1]. These accommodations can involve assistive technology (AT), architectural modifications, strategies, or policy changes. Prior research has shown that about 75% of employees with disabilities use some form of workplace accommodation [2], yet employers generally acknowledge their unfamiliarity with accommodation options [3-5]. To address this gap, we are building the Workplace Accommodation Expert Support System (Work ACCESS), an online tool/mobile app to help employers conduct a workplace assessment and determine individualized accommodations.

Work ACCESS provides employers and employees with a structured assessment system, as shown in Figure 1. First, it identifies the accommodation problem by collecting information about the employee, work activity, and environment. Next, a rule set/decision tree links difficulties with performing work activities to accommodation suggestions. For example, if a person reports difficulty with reach/grasp and using a computer, and the system would ask them to choose from relevant computer access problems (e.g., cannot reach all of the keys, cannot target desired key). For the problem of reaching all of the keys, the system makes suggestions such as using a compact keyboard, one-handed ergonomic keyboard, or a voice input system. This fit is refined by the inclusion of additional filters related to environmental factors (e.g., use of a shared workstation) or personal factors (e.g., low computer skills). The initial version of Work ACCESS focuses on office-based employment. However, when it is completed, it will address accommodation needs for employees with a variety of jobs and disabilities.

Yet, to develop this tool, we need detailed decision trees or algorithms to link the problems that employees encounter with work tasks to possible accommodations. This paper describes how we are developing these decision trees and how the lessons we have learned apply to the provision of workplace accommodations in general.

DEVELOPMENT METHODS

For this project, we have focused on a number of common work activities, such as using a computer or moving between building levels. For each of these activities we start by developing a preliminary decision tree with our project staff. Each activity is broken down into tasks (e.g., using a keyboard) and potential problems (e.g., cannot reach all of the keys). We then brainstorm different approaches for solving each problem, along with specific AT, modifications, or strategies that might work.

Next, we further develop the decision trees with a directed form of "crowd-sourcing". This is the idea that "the research efforts of a group of people with varying opinions, when aggregated, can result in better information than a specific expert could come up with" [6]. We are using a "crowd" of experts in the provision of workplace accommodations. Many of the participants have been specifically invited by the project team for their expertise in the work task or work population being discussed. Most have come from the AT Act Projects network and the National Assistive Technology Act Technical Assistance and Training (AT3) Center, RESNA, or the Centers for Independent Living. An advantage of using this crowd-sourcing approach is that the system’s recommendations reflect the experts’ experience with real people, real problems, and real solutions.

For the project, we conduct multiple group interviews, in which the expert participants comment on the latest version of the decision tree. Participants identify problems or solutions that may have been omitted, and provide feedback on how the solutions have been described. We have been holding an average of four group interviews per activity, but that varies somewhat depending on the complexity of the topic.

Our crowd-sourcing approach comes with the challenge of how to engage these experts. In practice, we have found that a mix of in-person and remote group interviews works best. The use of online conferencing systems to conduct interviews has enabled us to engage experts from across the country. The quality of the discussion has been on-par with in-person discussions. Yet, many people have expressed a preference for in-person dialogue.

For this reason, we have begun to conduct some of our interview sessions in conjunction with conferences that attract these accommodation experts.

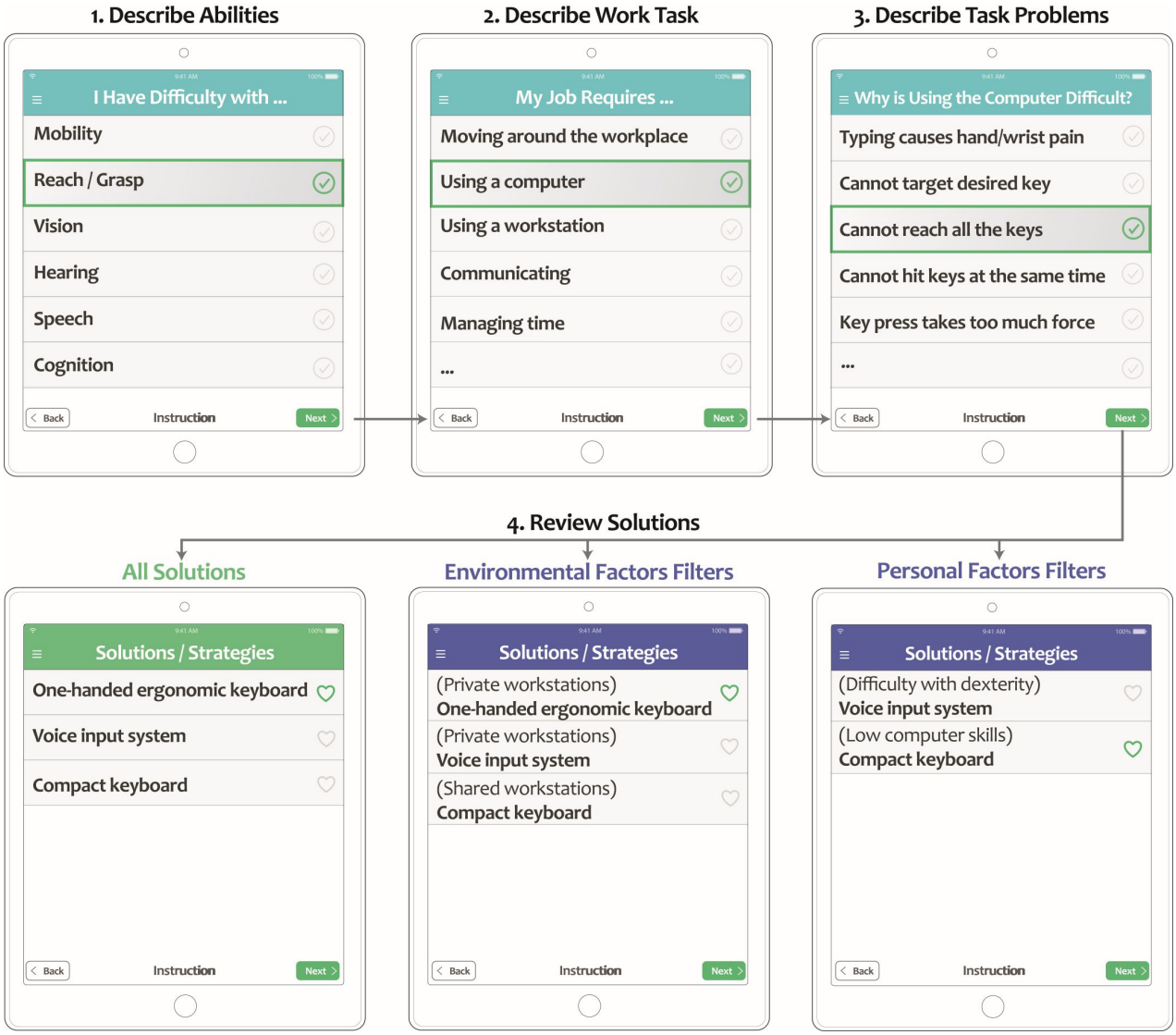

Figure 1. Operation of Work ACCESS Tool

We have also come to recognize that our experts might not always come from the workplace accommodation field. For example, accommodations for reading and writing in the workplace are very similar to those used in high school. Accommodations for dealing with stairs in a house have similarities to stairs in a workplace. Therefore, we have expanded our definition of subject matter experts beyond those strictly dealing with workplace accommodations.

A final step in our decision tree development process will be to ask additional experts (from the same pool of potential participants) to validate the final decision tree for each activity. An online survey will allow participants to comment on a section of the decision tree, including providing feedback on the wording used, the tags associated with the solution for filtering recommendations, and the need to consult experts. Employers and employees will also have the opportunity to provide feedback, particularly with respect to the description of the solutions. We are just beginning to implement this final development step.

DISCUSSION

Although our decision tree development has focused on a set of specific work activities, several cross-activity themes have appeared in the feedback that we are receiving. These themes, include the importance of looking at the entire accommodation situation; calling in experts as needed; and remembering to consider accommodations

that are low tech, mainstream, flexible, and customized for the employee. These themes apply to this project as well as the practice of workplace accommodations in general.

First, although our decision tree development was structured to deal with one work task at a time, the experts pointed out that a more holistic approach is needed. In particular, some aspects of using the workstation have the potential to impact other aspects of the employee's comfort and performance. For example, the appropriate height of a workstation surface depends on the height of the chair being used, and, therefore, these can't be described independently of each other. The setup of the workstation impacts the positioning of work equipment and materials, and thus, impacts the reach to a computer keyboard and the visibility of reading materials. In addition, some solutions can potentially address more than one problem (e.g., screen reading for computer access; OCR plus screen reading for reading documents). Service providers described frequent situations when they have been called in to solve a singular accommodation problem, but their actions impacted other aspects of the individual's work. We are investigating how to make our assessment tool take these accommodation interactions into consideration.

Next, we engaged in many discussions about when employers should attempt to implement workplace accommodations and when experts should be called in. From the beginning, we wanted to make sure that Work ACCESS would refer the employer to outside experts if a particular accommodation idea had medical or safety implications. Our experts agreed, and were particularly concerned about accommodations involving employees with complex seating/positioning or communication challenges. In addition, during discussions of workstation use, our experts had concerns surrounding how improper positioning might lead to secondary repetitive strain injuries from data entry or material manipulation. The decision trees suggest that experts be called for more complicated or expensive options. Our experts added that to avoid frustration on the part of the employer, outside experts should be called in if a solution process requires trial and error. Citing the adjustment of workstation components as an example, they were concerned about how much time an employer would be willing to invest in a process that might not yield a simple, immediate, definitive result. We will be seeking additional feedback on this topic from both accommodation experts and employers.

When it came to identifying accommodation solutions, the expert panels indicated that our project team of AT specialists and engineers generally did a good job of including the available AT options in our decision trees. However, there were a number of low tech solutions and strategies that we had not thought of or forgot to include. We also overlooked some accommodations that were not exactly low tech (many involved the use of a mobile device), but were solutions used by both people with and without disabilities. For example, the experts discussed how unfamiliar words can be looked up on a phone to help with reading, and how a standard alarm set to vibrate can remind an employee when their break is over. Our tendency to overlook some simple solutions may serve as a caution to accommodation providers to make sure that they do not do the same during their assessments.

The importance of accommodation adjustability and having options was noted. An employee may need to adjust or change their accommodations throughout the day. For example, many people are most comfortable when they are able to change positions. They can benefit by being able to continuously adjust the positioning provided by adjustable workstations or seats, not just adjusting them once and maintaining that setting. This need for flexibility might also include having different options for computer access to best fit the task or the abilities of the person that day. For example, voice input may work well for an employee early in the day, while another method may be preferred later in the day when his or her voice is tired.

Finally, the importance of customizing the accommodation for the employee was a common theme. Our solutions provided a good starting point, but the experts noted that sometimes more might need to be done – for example adjusting AT settings or setting up supports for the specific schedule of the individual. A good example of the need for customization was brought out when we discussed "listing out task steps" as an accommodation for an employee who has trouble remembering how to complete a task. Our experts were quick to point out that not only would that information need to be conveyed in a format that the employee understands (e.g., text, images, video), but that it would be best if the employee made the list out themselves, with help as needed. This approach ensures that instructions use language that the employee understands. For accommodation service providers, the significance of this customization is that it adds to the amount of time needed to implement recommended accommodations.

CONCLUSIONS

The process we are using to develop Work ACCESS underscores key elements in the provision of workplace accommodations.

First, it emphasizes the importance of expert involvement in the accommodation process. We have relied on the input of accommodation experts to develop Work ACCESS' decision trees. We have learned that although the tool is being developed to help employers and employees make accommodation decisions, there are a number of scenarios in which outside expertise is recommended or is even required. We may find that in these situations Work ACCESS serves best as a tool to frame discussions and accommodation planning between the expert and the employer and employee.

Next, it demonstrates that the provision of successful workplace accommodations is complex. Employers and employees (and service providers) need to be guided, not just by the identification of individual task requirements and employee needs, but by the various and interrelated contexts in which work is carried out. They need to be aware of the impact of one accommodation solution on other work tasks. They also need to plan for flexible solutions that accommodate individuals whose needs change over the course of a day, for example, due to pain or fatigue.

Finally, it reminds us that the workplace accommodation process involves not just recommendation, but also implementation. Some accommodations need to be adjusted or customized to the individual, and an iterative trial and error process may be needed to provide the best fit.

We will be addressing these issues as we continue to develop Work ACCESS. An initial version will be launched in Fall 2020, after which we will continue to expand the scope of the work tasks included in the tool. During the project period, it will be available free to the users who sign up to provide feedback on their use of the tool. Employers, employees with disabilities, and service providers will be provided with a tool that they can use to make more informed workplace accommodation decisions.

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