

Examining the Current State of Group Support Accessibility: A Focus Group Study

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Abstract. Group support applications are widely used in workplace. Unfortunately, persons who are blind often found it difficult to access group support applications, due to the highly graphical nature of the application; this hinders their ability to contribute to the group. As a result, persons who are blind often face problems in gaining and retaining employment. This paper presents preliminary results of a focus group study conducted at the National Federation of Blind (NFB) on accessibility and usability issues of group support applications. How persons who are blind utilize group support applications to support their group tasks, the tasks/steps utilized to complete a group project, the accessibility and usability issues experienced, the reasons for discontinued use of group support applications, the other tools utilized to support group work, the accessibility design considerations, and the accessibility documentation and support needed are discussed.

Keywords: Group support, accessibility, usability, blind.

1 Introduction

According to World Health Organization [19], about 314 million people are visually impaired worldwide, among them 45 million are blind. In today's global economy, collaboration is very important in business [16]. Many organizations utilize group support applications that support communication, coordination and collaboration (such as email, document sharing, scheduling software, conferencing systems, etc) for their collaborative work. Considering the unemployment rate for working age persons who are blind in the united states of 70% to 75% [11], the accessibility problems associated with group support applications become crucial. In order to improve the design of group support applications, the following questions need to be answered: How do persons who are blind work in groups? Are there any differences when compared to a group containing all sighted members? What are the accessibility and usability challenges persons who are blind experience with software applications (specifically groupware or group support application)? What kind of support do persons who are blind require so that they can perform group work?

In an initial effort to answer the above research questions, a focus group study was conducted with the help from the National Federation of Blind (NFB). This paper reports the activities of the focus group study conducted and its preliminary result.

2 Related Backgrounds

2.1 Accessibility and Usability Issues for Persons Who Are Blind

Accessibility describes the degree to which a product, device, service, or environment is accessible by as many people as possible. It is often used to focus on people with disabilities and their right of access to entities, often through the use of assistive technology. In order to understand the output from computer systems, persons who are blind are forced to use either tactile displays or sound. A screen reader (e.g. JAWS, Windows-Eyes) is a piece of software that runs in the background to read the screen memory and send any text it finds there to a speech synthesizer [12]. However, the screen reader cannot interpret graphical information on the screen, if the program is not properly programmed.

On the other hand, usability refers to the extent a product (e.g. device or service) can be utilized by specific users to achieve specific goals with effectiveness, efficiency and satisfaction. When persons who are blind are aware of an application's accessibility and usability issues, they are more likely to avoid using that type of application.

2.2 Groupware and Group Support Applications

Groupware applications are the technical applications to assist persons to communicate, coordinate, collaborate and compete [13]. Groupware can be considered a comprehensive tool that includes email, group calendars, as well as tools such as: wikis, blogs, social networking, etc. As the technology evolves, more software applications start to incorporate key features of groupware applications. For instance, a document editor can provide features such as: shared track changes that allow collaborators to co-write papers; or, an email application, which allows the sharing of calendars from multiple users. Even though the above examples are not typical groupware applications, they do incorporate key features of groupware applications that support group work. The researchers refer to these software applications as group support applications.

3 Research Method and Procedure

Focus groups are group interviews. Generally, a focus group is utilized for marketing research purposes while it has been used in social and design research since the 1930's [2]. Focus groups are very useful for the generation of ideas and for discovering problems, challenges, frustrations, likes, and dislikes, among participants especially when the researchers do not have enough information to design a survey. Moreover, focus groups allow for the access of multiple points of view in a short time period (e.g. a single meeting) [2]. The size of the group can vary from 4 to 6 as a mini-group to more than 10 as a full group [5]. Considering the explorative nature of

this particular study, the researchers believe a focus group study was an appropriate approach to gathering data regarding group support applications.

As Goebert and Rosenthal [4] noted, “*the primary consideration is who will provide the most insightful information,*” related to the topic when conducting focus groups. The participants of this project must meet the following requirements: Persons who are blind, with no residue vision; Persons who work in group settings; Persons who are familiar with screen readers; Persons who utilize computers for their work; and, Persons who have tried to use group support applications and other tools to support his/her collaboration with others. Considering the limited time that each participant can contribute, a mini-group of five participants, from the Access Technology and Education Teams at the NFB, were utilized for this study in order to get more in-depth information [5].

The focus group session was conducted at the National Federation of the Blind (NFB) [10], in Baltimore, Maryland. The focus group session, contained the following steps:

1. Recruit the participants;
2. Prepare demographic, prior-experience questionnaire and meeting guideline;
3. Conduct the focus group session, based on the meeting guideline;
4. Perform content analysis of the audio transcript and the researcher notes, to identify content categories;
5. Validate agreement of the coded content, using Cohen’s Kappa [1]; and,
6. Report findings.

Prior to the focus group study, each participant filled out a short questionnaire, regarding demographic information and prior-experiences with group support applications and screen readers. A meeting guideline was designed, containing a list of possible questions for discussion.

In order to be easily accessible for the participants, the focus group session was conducted in a private conference room at the NFB. One researcher served as the moderator, while the other served as a note-taker during the session. Additionally, the focus group session was audio recorded. The focus group started with a brief introduction from the moderator on the purpose of the meeting, a round of brief self-introductions, and followed by a discussion on several topics prepared before the meeting. Follow-up, probing questions were asked to ensure the understanding of the discussion.

Following the focus group study, the researchers’ notes and the audio recording of the group discussion were transcribed with the permission from the participants. The audio transcript and detailed notes from the group discussion were coded based on the themes that emerge from the participants’ comments. The focus group session’s duration was one hour and thirty minutes.

4 Preliminary Results

4.1 Demographics

The participants of the focus group study included five members of the Access Technology and Education Team at the NFB. The five participants consisted of three

females and two males. All members are between 20 and 39 years old. All of the participants utilized the computer daily, for business use, and have utilized the computer between 11 and 20 years. All participants utilize the JAWS Screen Reader [3] with two participants having 6 to 10 years experience and two participants having 11 to 20 years experience. The fifth participant did not respond to the number of years experience with the JAWS Screen Reader.

None of the participants reported that they ever used any traditional full fledged groupware applications, so the researchers focused on group support applications that include some groupware features such as: shared calendar, email, track changes, and chat. The participants were asked to identify all the group support applications they have used for group work. As the result, Microsoft Outlook (application version 2008) [9] was identified as the primary group support application utilized most frequently in completing group projects at the NFB. One participant had 1 to 5 years experience, three participants had 6 to 10 years experience and one participant had 11 to 20 years experience using Microsoft Outlook. All participants used Microsoft Outlook daily. When interacting with Microsoft Outlook's interface, the participants utilized the JAWS Screen Reader exclusively.

4.2 Data Analysis of the Focus Group Study Recording

Content analysis was performed on the audio transcript and researchers' notes from the group discussion collected from the focus group study. Two research assistants performed as coders for this analysis. Key points were grouped into categories. Inter-coder reliability [7] was calculated to make sure of the consistency of the coding. Statistical analysis on the agreement between the coders was calculated using SPSS [14], using Cohen's Kappa [1]. The Kappa measurement of agreement sought was 70% or greater, to provide evidence of acceptable agreement and reliability between the coders. For the 86 cases generated from this focus group study, a Cohen's Kappa of 0.757 was achieved, providing evidence of acceptable agreement and reliability between the coders. Seven categories were determined as a result of this analysis:

- Participants identification of group support software utilized;
- The tasks/steps necessary to complete a group project;
- Accessibility and usability issues experienced;
- Group support applications utilized, but discontinued;
- Other tools utilized to support group work;
- Accessibility design considerations; and,
- Suggestions on accessibility documentation and support.

Participants Identification of Group Support Software Utilized. During the focus group study at the NFB, it was discovered that the participants did not utilize any traditionally identified groupware (e.g. Lotus Notes); therefore, our discussion was focused on group support applications that may contain some groupware features. Unsurprisingly, the primary group support application reported was Microsoft Outlook for various activities including: email, journal, calendar, contacts, and tasks.

The Tasks/Steps Necessary to Complete a Group Project. The participants reported that they always start a group project with a face-to-face "brainstorming

session” in a conference room. Conferencing calls are normally made in the situations involving group members in another location. During the face-to-face meeting or conference call, a member of the group is normally responsible for note taking. Once the start-off meeting ends, the group’s manager sends emails with documents containing the ideas discussed. A project schedule and task list is developed by the manager and sent through Microsoft Outlook, as either an email or calendar items. The group then exchanges emails to discuss further on the project. Weekly or monthly face-to-face meetings or conference calls are conducted throughout the project duration.

Accessibility and Usability Issues Experienced. Based on this initial research, it appears that Microsoft Outlook used in conjunction with the JAWS Screen Reader has both accessibility issues and usability issues.

Most of the participants agreed that the web-based version of Microsoft Outlook is inaccessible and instead the group utilizes the application version of Microsoft Outlook. Therefore, all the comments are focused on the application version (Windows-based) of Microsoft Outlook. The accessibility issues identified for Microsoft Outlook include: inconsistency issues between Microsoft Outlook and the JAWS Screen Reader; reading the wrong message by the JAWS Screen Reader; and, accessibility issues with the Journal, calendar, messages, login screen, and contacts.

The first challenge the participants face is the inconsistency of the accessibility of the various features of Microsoft Outlook, as well as the interactions between the screen reader and the application. For example, the participants commented, “*Some days it (screen reader) works, some days it does not work. Whether it works, depends on the individual machine.*” After further discussion, it was realized that the problem may be attributed to the version of the operating system, the version of Microsoft Outlook, or the version of the JAWS screen reader installed on each individual machine.

Another accessibility issue identified by the group is related to the software upgrade and version of the screen reader. For example, participants commented on the problem they experience when trying to switch views in “calendar” feature, “*It worked with JAWS 10. It is not working with JAWS 11*”. It appears that upgrading the JAWS Screen Reader to a newer version may cause inconsistency issues with group support applications. In this case, utilizing the daily-view of the calendar was a work-around for the inaccessibility of the monthly-view of the calendar. In some inaccessibility cases, often the solution may be to approach the interface from another direction, such as, utilizing a different view (daily-view versus month-view) to access information.

Since the first step to utilizing Microsoft Outlook is to log into the system, it is necessary that the login screen be accessible. If the login screen is not accessible, the whole system will not be accessible. A participant commented, “*Occasionally, the Login Screen (Microsoft Outlook) will not read correctly (using the JAWS Screen Reader). I have to set Outlook to work offline and then login again.*” The participants proposed a work-around solution to the accessibility issue of the Login Screen, which is to uncheck the work-offline check box within Microsoft Outlook’s interface.

The participants ranked the “calendar” feature of Microsoft Outlook as being the most inaccessible feature of Microsoft Outlook. The participants expressed that they

did not receive notifications of important events, such as meetings or appointments. As a result of not receiving any notification of a meeting or appointment, they may miss an important deadline. The JAWS Screen Reader may need to be enhanced to respond to events, such as the notifications of meetings or appointments.

The participants also reported that the multiple panels utilized in Microsoft Outlook presents a big challenge for screen readers. The participants had to move from one panel to another panel, to complete certain tasks. One method to work-around the movement between multiple panels was to display on the interface one panel and to hot key directly to other panels. The adjustment of the interface to present one panel of the interface simplified the complexity of the interface and reduced the amount of information presented to the screen reader. The less complex the interface, the better the interaction between the screen reader and that interface.

The Participants identified usability problems of the applications they use during the discussion. The participants ranked the “calendar” feature of Microsoft Outlook as being the most unusable feature of Microsoft Outlook. The participants complained that they were not able to, “*share the calendar.*” Additionally, they commented that appointments were not tracked correctly.

When discussing the “email” feature of Microsoft Outlook, the participants noted that they may not receive a message, or the message may not read correctly. A Participant commented that the messages are not up to date, “*sometimes I have to refresh. The new message is on the screen, but it is still reading the old message.*” The screen reader must properly and consistently read messages in the order they are delivered in order for any group, dependent on a screen reader, to respond and function as a team.

The “contact” feature of Microsoft Outlook presents another challenge for the group participants. They reported that, “*it keeps reading the same contact (even though I know I have kept more contacts in the system).*” The minimum requirement of the screen reader should be to identify an entire list and to be able to parse that entire list in any order.

Additionally, some features such as the reading pane had to be removed from view in order for the JAWS Screen Reader to work in a manner that the participants could understand. Basically, the interface worked better with the JAWS Screen Reader, when the interface was less cluttered.

There are a number of accessibility and usability issues reported by the Access Technology and Education Team, but for the most part they appear to be related to how the screen access software interacts with the graphical interface. Some of the accessibility and usability issues seem to pertain to synchronization issues between the screen reader and the content.

Group Support Applications Utilized, but Discontinued. The focus group identified group support applications attempted for group work and discontinued. The goal was to identify the reasons why applications were discontinued and, if there was a common set of reasons. The Access Technology and Education Team have tried a number of group support applications, such as: WIKI, Survey Monkey, and Microsoft Access. However, they have identified several reasons for their discontinued use including: previous unsuccessful experience; lack of interest; and, additional learning curve.

It appears that the focus group participants are apprehensive to use technologies that they have not tried, due to their previous unsuccessful experience with other software. For example, a participant commented that they are, *“Easily intimidated by the other tools or they are not accessible. When you branch out, you may not get the best accessible tools.”* Unlike the widely used discussion forums, such as: group project discussion forums or class discussion forums, utilized among persons without visual impairment, the participants expressed a lack of interest in such applications, *“it does not lend itself to the work environment.”* The extra learning curve was another reason noted for not attempting new applications, *“When you learn to use the computer, you have to learn three things: the operating system, the application and the screen reader software. Sometimes it is just not worth it (to learn new software). Then, there is the extra learning curve.”* Anytime persons who are blind attempt to utilize a new group support application, they have to orient the screen reader to the interface of the application and learn the nuances of the application.

Other Tools Utilized to Support Group Work. In addition to Microsoft Outlook, the following tools are utilized occasionally by the Access Technology and Education Team: America Online (AOL) Instant Messaging (IM), for quick messaging; Microsoft Word, for document sharing; WIKI, for document storage and sharing, Twitter and Facebook, for social networking; and, Mobile Phones for, text messaging. As a Team, the Access Technology and Education Team utilize a small number of applications, when working in their group. The key to the limited use of other applications may be due to the accessibility and usability issues experienced, and the difficulty of learning new applications.

Accessibility Design Considerations. During the focus group study session the participants emphasized that the screen access software needs to be consistent when interacting with the application’s interface. Considering some of software manufactures developed interfaces that provided voice-over to their application to provide accessibility, a question regarding the participants’ preference on voice-over interfaces versus using a screen reader was asked. The voice-over interface application choice was determined to be an unacceptable solution by the focus group participants. The participants commented, *“understanding how to use the self-voicing application in conjunction with the screen access software for other applications would be a hassle.”* Even though the screen reader is not perfect, the use of one screen reader for all applications was determined to be easier and the preferred approach for accessibility and usability.

Suggestions on Accessibility Documentation and Support. The support for accessibility features is extremely limited compared to the support provided for other features. A participant noted, *“Normally, to learn about accessibility features, you have to dig down pretty far to know whether an application supports accessibility. When other features of the product tend to be more available.”* And, in most cases, there are few documents on accessibility features that, *“They (accessibility features) are generally a small statement in the back of the documentation.”* These problems may be caused by the reluctance of the design team, *“They really don’t think about the user group they are serving. They do accessibility as a matter of course – as a requirement.”* Therefore, *“there is a responsibility of the developers that they provide the same support for accessibility features.”*

The participants also suggested that the support staff of group support applications need to be trained on accessibility issues as well, *“If I go home today and call Apple and say I need help with voiceover, 9-times-out-of-10, they (support staff) will not know what I am talking about. Are accessibility features not important enough to train their support staff on?”*

5 Discussion

Since the focus group participants are blind, this research provides a unique perspective on the group process conducted entirely with blind participants. The participants agreed that the normal group projects follow this general pattern: face-to-face/teleconference group discussion in a conference room setting; and, follow-up discussions and document exchanges utilizing email (MS Outlook). The most frequently utilized features include: the *calendar* for appointment tracking; *email* for information exchange, the *journal* for notes; the *contacts* for contact information; and, the *tasks* for tracking the progress of a project. Although the group process may appear similar to be a standard group process, with meetings and exchanges of email, the difference is that persons who are blind require assistive technologies (e.g. screen readers and note takers) for exchanging ideas.

While conducting the group process, persons who are blind will utilize adaptive technologies such as: screen readers for reading documents and email messages; and, note taking devices to record minutes during meetings. Similarly, Woodfine’s [18] research identified the need for special support and assistive tools for persons with dyslexia to interact in synchronous e-learning environments. How can we better integrate these adaptive technologies into the group process for the support of group work? How can researchers and developers create a complete group support solution with accessible email, chat and document exchange?

As more and more applications have made their way to become web services, researchers have been focusing on the accessibility of web interfaces. For instance, Harrison [6] had identified approaches to making web pages accessible but did not report approaches to improving the accessibility of windows-based applications. Unfortunately, windows applications are still utilized in many businesses as tools for group work. This research made the attempt to identify accessibility and usability issues in regard to windows-based applications, specifically Microsoft Outlook. Accessibility and usability issues occurred while reading text messages, or reading the wrong message, accessing items in the calendar, logging in, and accessing the journal and contacts. Since, windows-based applications do not support HTML, Web-based solutions to accessibility do not work for windows-based applications. Many of the features employed in Microsoft Outlook such as: calendars, emails, lists in journals, and contact lists, are common elements among many group support applications. How can researchers and developers improve the accessibility of windows-based applications, which support email, calendars, and lists?

Steep learning curve and the inability to solve the accessibility issues encountered are identified as main reasons why persons who are blind discontinued or would not attempt to utilize new group support applications. This is consistent with the design guidelines generated from previous research [13]. Even though all of the participants

of the focus group study were capable users of the operating system, the selected group support applications and screen access software, they still expressed the apprehension of utilizing new group support applications. Given the participants' skill levels and their difficulties with inaccessible group support applications, it can be predicted that less skilled persons who are blind or working in groups with sighted persons may experience more severe challenges when interacting with group support applications.

Takagi's [15] Notes Reader and Watanabe's [17] Blog Reader were two examples of redesigning the web-page interface and including voice-over as feedback. The design suggestion of an accessible self-voicing, or voice-over, group support application was presented as an alternative to utilizing a screen reader. This suggestion was unanimously found to be less acceptable than the use of screen reader software, to access group support applications. Even though Takagi's [15] and Watanabe's [17] voice-over solutions worked in their case, it was determined by this research to be a less-acceptable solution to the use of a screen reader as the interface to group support applications.

The focus group study participants expressed the need for consistency, when discussing design considerations. Similarly, Luk's [8] research with spatial clustering was devoted to the need to organize content and make the interface consistent. For the most part, the focus group participants agreed that the group support application's (Microsoft Outlook) interface was good, but the interaction between the screen reader and the application was the primary cause of their accessibility issues. As different versions of the screen reader software are developed, older versions of the group support applications may no longer be accessible. How can researchers and developers deliver consistent and integrated group support applications that function properly with screen reader software?

Unique to this research is the presentation of the concept of determining the appropriate level of accessibility support and documentation needed by persons who are blind. Often, the participants of the focus group want to use new features of group support applications or even new group support applications, but the support and the documentation on accessibility is limited or non-existent. This lack of support for accessibility causes frustration on the part of persons with disabilities and their discontinued use of the group support application. How can researchers and developers determine the necessary level of support that should be devoted to accessibility and usability?

6 Conclusion

The focus group study participants identified accessibility and usability issues while interacting with group support applications. The limitations of this preliminary focus group study are due to the small number of participants, and the common backgrounds of the participants. The results cannot be generalized. Since the original writing of this research, several field studies and additional focus group studies were conducted.

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