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How Can We Utilize the Capabilities of an E-Reader in Creation for AAC Devices

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Introduction:

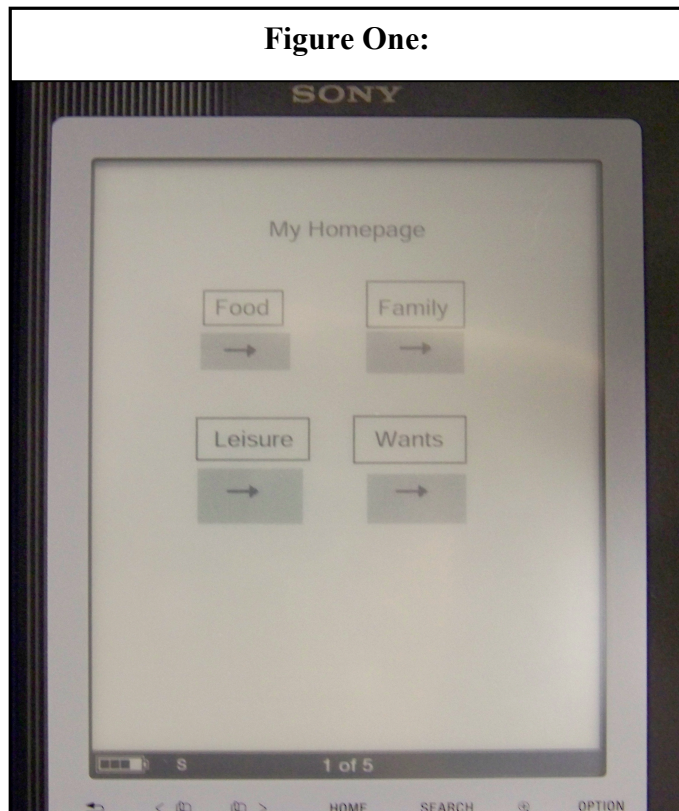
This technical report will describe how we attempted to create simple communication and alphabet boards with various e-reader devices. The Sony PRS-700 and the Amazon Kindle were explored. These e-readers are described in more detail in the report titled: "Comparison of the Sony Portable Reader System and the Amazon Kindle". The first step in the process however was not to use these devices. We needed to create pages, which would mimic communication boards in order to determine how the e-readers would convert and use these files. Therefore, PDF pages were created using Adobe Acrobat Professional. Alphabet boards, a "homepage", and basic pages, which included text and graphics, were generated. All pages were linked within one document. All pages were then imported on to each specific reader. The following technical report will discuss the specific process in order to place the communication boards on the devices as well as the technical problems and implications.

Sony Portable Reader System (PRS-700):

Development Process:

As stated before, PDF pages were created in order to create simple communication boards. First a homepage was created. This was created on a blank PDF document, which had images inserted to represent the different communication boards that the homepage could link to. Text boxes were inserted underneath the pictures in order to orthographically represent the corresponding image. After that a sound file was attached to each image on the homepage via an option in Adobe Acrobat Professional. The option to add audio to PDF's can be found under the Tools menu, Advanced Editing, Sound Tool. The additional pages such as the food page, family

page, leisure page and wants page were constructed in the same manner as explained above. Figure 1 illustrates how the homepage PDF looks when on the PRS-700:



After these pages were created they then needed to be "linked", so that when a user touched an image it would take the user to the correct corresponding page. These links were created using the tools menu in the Adobe software, under advanced editing, link tool. It is important to note that in order to link these pages properly, all of the pages must be contained in one document. It was not possible with the PRS-700 to have it open completely separate files. However, this can be accomplished in the PRS-700 when the pages are in the same document.

The final step required us to move the document that we had just created on to the PRS-700. This was simple enough, since this reader acts as a USB mass storage device. We

were able to drag and drop our document from the computer right on to the PRS-700. We then turned on the reader, went under our book menu, and touched our file to select and view the PDF document. The integrity of the original document was maintained and all of the links to the other simple communication board pages transferred and were able to be executed when using the PRS-700.

Technical Problems and Limitations:

Although the integrity of the documents were preserved, there were some technical issues and limitations of using the PRS-700. First, even though audio was attached to each of the pictures on the communication boards, you are not able to hear the audio when viewing the document. This is due to the fact that the PRS-700 does not have a text to speech option and the only audio it can play are MP3 files. Furthermore, if the PRS-700 did have a text to speech option or was able to play different audio sources, each communication partner would need to have access to the same set of headphones. Due to the physical positioning of communication partners needed, the communication exchange would not mimic what would be expected from naturalistic conversation.

Another problem is that the screen is sometimes difficult to view in different lightning conditions. Additionally, the screen takes some time to adjust when linking to different pages in the file. Due to this, it would be best if a communication partner weresitting directly next to the user of the ereader so that they can best see the screen. However, this positioning can be awkward and limiting in a conversation.

Implications:

The PRS-700 has some limitations that need to be discussed. First, the lack of audio/text to speech options and external speakers limits the use of this device. These limitations make it difficult to have a natural conversation, due to physical positioning of the other communication partner. Furthermore, the lack of audio places the communication partner of having to guess or read off the screen what the AAC user wants to communicate. Some AAC users, may not like relying on someone else's voice in order to communicate their intended messages.

The PRS-700 has some promising implications for the AAC community. First, it was relatively quick and easy to make the communication board pages. This means we have a blank slate to start out from, so pages can be individualized and customized for each user. Besides the software restrictions that would be placed on us by our PDF maker, we can design communication boards to meet whatever the current needs of the user. By using a device like the PRS-700 we can store many different pages and make it easy to navigate these pages. Furthermore, this device is relatively inexpensive (around \$350.00) which makes it more readily accessible to users and developers.

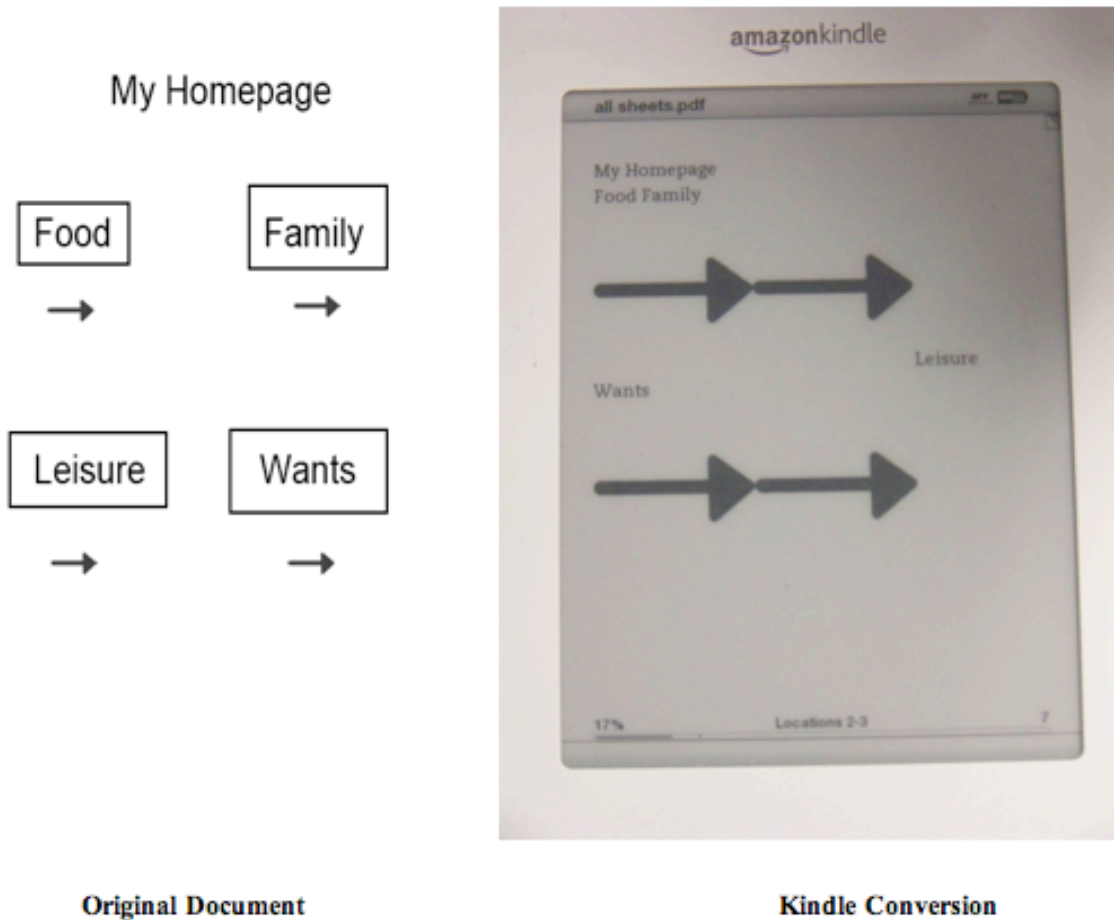
Amazon Kindle II:

Development Process:

The same PDF pages, which were described above, were used with the Amazon Kindle II. The pages were transferred to the Kindle II via their experimental conversion software. In order to do this the user sends an email with the document attached to their kindle email address. Then

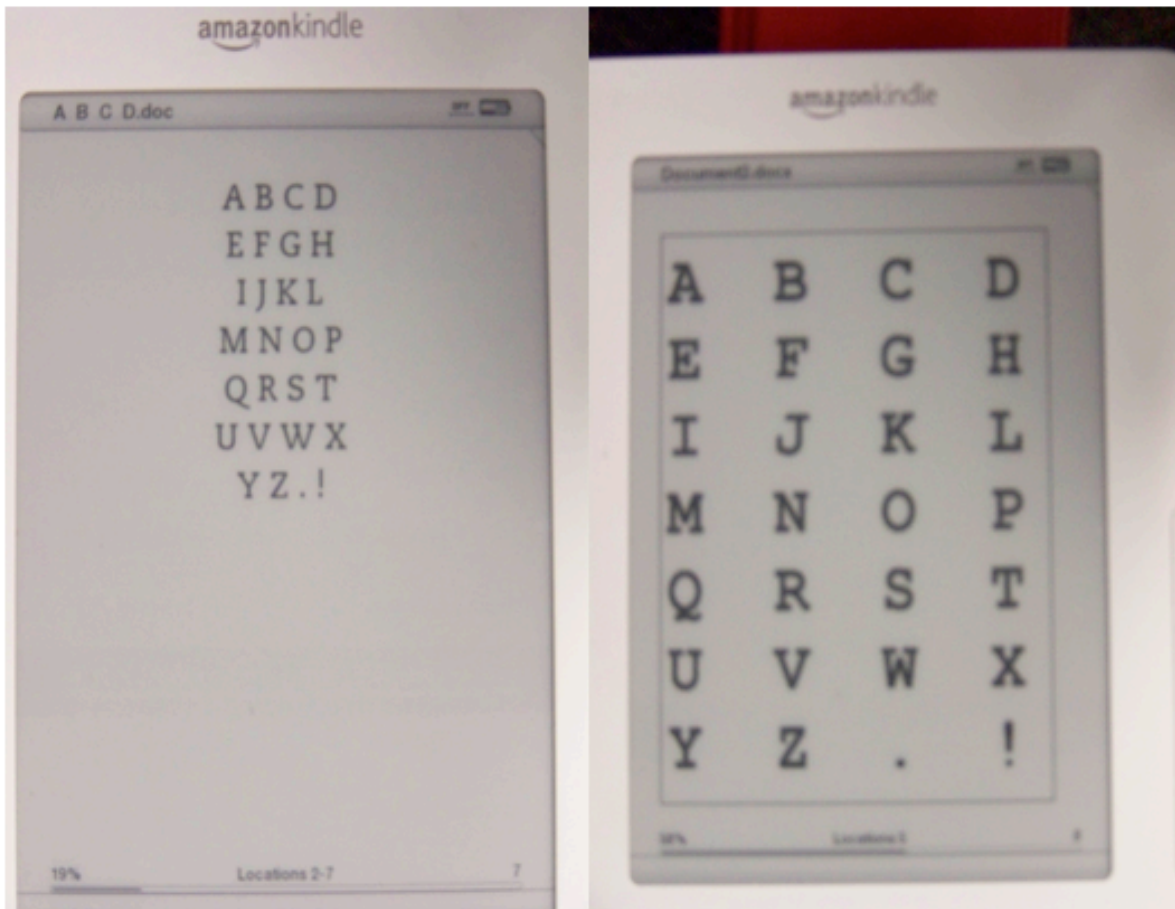
once the device is turned on the Kindle II's wireless capabilities will automatically sync and transfer the document to the Kindle. However, the conversion process did not maintain the integrity of the original communication boards. Figure 2 shows the original document and the Kindle II conversion:

Figure Two:



Due to these complications during the transfer process, we decided to recreate the communication boards in a word document, by attempting to link text to a graphic via text box links. However, this yielded similar results seen with the PDF pages. The Kindle II's conversion simply placed the text and picture next to each other on the same page. Next, we decided to create a simpler document by creating an alphabet board in Microsoft Word. It was found that spacing was not maintained when typing letters evenly across the page. Therefore, we made the text into a graphic and copied and pasted the graphic into the Word document. After completing the conversion process we were able to maintain the visual integrity of the document. Figure 3 illustrates the alphabet boards that were just described:

Figure Three:



Text Conversion

Making Text Graphic Prior to Conversion

Technical Problems and Limitations:

Due to technical problems in the PDF conversion process, we conducted internet searches to see what other users were doing in order to resolve the issues. Some users suggested to using other PDF makers before transferring your document through the Kindle service. In attempt to resolve conversion difficulties MobiPocket Creator was utilized, however, the same conversion problems remained. By reading and researching more we found that documents which contain more advanced features, such as graphics, text boxes, links, and additional pages, are usually not converted correctly by the Kindle service. It seems that text only documents are the ones that are best converted and then viewed on the Kindle II. While the graphics and text were much clearer when displayed on the Kindle II screen, they would not be able to be used during communicative acts. Due to these limitations, the audio and text to speech capabilities, could not be explored.

Implications:

If we were able to bypass the Kindle II's conversion process, and drag and drop items on to the Kindle (ie. like a USB storage device) hopefully results similar to the PRS-700 would occur. Also, if we could learn how to have the Kindle's audio options work, since the device does

contain an external speaker, then we would hopefully be able to limit the physical positioning issues that were found with the PRS-700. Unfortunately, due to the technical problems with the Kindle it is difficult at this time to determine the full implications for using this technology as an AAC device.

Conclusion:

The current e-readers that have been discussed offer great promise for users and developers in the AAC community. With newer versions being developed, we will hopefully be able to go beyond the limitations that are currently presented to us with both the Sony PRS-700 and the Kindle II. If these hurdles, technical problems, and limitations can be cleared this new technology offers us a wide horizon of possibility.