Ganesh Arumugam & Team5
Project: HearMe

The Boston Home, Dorchester MA
Boston Home is a not-for-profit specialized care residence for 96 adults with advanced Multiple Sclerosis and other neurological diseases. The typical patient age at this facility is 57 years and there patients have a wide variety of motor impairments. Most patients are on motorized wheel chairs, and have some form of weakness in their arms. The patients have some form of speech impairment ranging from mild impairments to swear impairment and around one third of the patients have swallowing disorders.
Reason:
Our project's target users are speech impaired people, adults who stopped speaking after sometime in their life. So we wanted to explore this place and get details about our target users. The place is 30 minutes from college and one of our team mate (Mansoor) had been working there over a period of time. So this created a perfect platform to explore the place and approvals were given in quick time. The speech pathologist, A was very helpful and identified people whom we can interview for our project. He was also interested in the project and also offered us assistance for arranging future visits for our team.

Interview questions:
1. Has using this device impacted your life in any way?
2. How often do you speak on your own rather than using your device?
3. Is there anything you would change about your device?
4. Can you remember a time when you were unable to carry out a conversation through this device?
5. On a score of 1 to 5, 1 being unsatisfied and 5 being totally satisfied, how satisfied are you with how long it takes to find the right sentence you want to express during a conversation?

Ethnographic Field Notes:

Date: 01-28-2013
Site: 2nd floor, Boston Home
Time: 12:30 P.M. – 2:45 P.M.

When we arrived at Boston Home, we were given a warm reception by A. We introduced ourselves and he took us to his office on the second floor. It was a small room with 3 desktop systems and few lockers. He gave us a brief introduction about Boston Home and handed over few forms to sign before meeting the people. The forms were based on HIPAA (Health Information Portability and Accountability Act) and we signed it. He explained about the device group meeting happening once every month where all the people using devices get along and shares their experiences of using the device.

We actually wanted this type of setting to explore how people are using AAC devices for their communication. It was a blessing in disguise that we were able to observe a small group of people using their device on this particular day with the help of A.

But there was half an hour left before the group meeting could begin, so A asked whether we want to interview a person before it. We were all set and said yes, we would like to start our work. So we moved into the hall way and into a room where we met F.

Some background information about F, he was paralyzed for 10 years from neck down and could speak without using any AAC devices. He has some background information about computers and his brother is a computer engineer, who builds customized software applications for F. A introduced us and gave a brief overview about our project. F accepted the request and said a big "Hello" to us in his own voice. We asked him to operate the computer and perform a task. F obliged happily and started speaking with his own voice into the microphone. F was looking at the TV mounted on the wall, since it acts as a screen both for TV as well as a computer monitor. F opened custom software (gmail) which was speech recognition software and built on windows. F ordered the system to move down three places to read a particular email. The system prompts him whether to proceed or cancel. F said yes and the email was read aloud to him. F can then reply to the message using a 25 second long voice message. He asks to scroll down in a message and system was scrolling the message at a slow pace.

So F basically uses his voice to perform his tasks. Certain things were evident during this interaction,

- His voice was not continuously loud, so system at times could not recognize the words he spoke.
- He could not interrupt the system when a task was being performed. An example, F has to wait till the system completes performing his previous task (like reading an email).
- F was clearly frustrated when the system did not respond properly to his commands.
- The system showed a '?' whenever his voice was feeble or not understandable by the machine.
- The software closed abruptly thrice, when F was trying to perform a task.

Analytical inference from the above passage would be summarized in the following way,
Since his voice level was low, we can use an amplified output as an input to the system. We can customize the screen for him showing his previously completed tasks. And have a simple system that works robustly at all conditions to perform a task. Since if we can avoid frustration, I think we have won half the battle of helping these people use this system in a better way.

F was using computer for a year and he feels happy that he can use the system like regular people. He informed us, that his brother is working on a customized skype. He is generally tired and can't use system for no longer than an hour. He feels very satisfied with the current software. This can be because of the reason that his brother is building these customized software and based on his experiences.

The group meeting was due as soon as we completed our session with F. When we came out of the room, we saw a heavy rush in the hallway, since everyone was navigating in their wheelchairs to their respective sessions. It was a clean place and each person was assigned a care giver. The caregivers were always wired and constantly running from one room to another. The rooms for these people were spacious and had a TV and desktop and pictures of their family. We could even spot a lot of toys, sports banners, etc. So basically each person has some interests and hobbies. The group meeting room was on the end of the hall way and was bigger and each person arrived with their device.

A headed this meeting and started addressing their concerns. A speech during this meeting struck me, "We want to just communicate and don't want fancy devices" by M. Since most of the devices are always on, the charge on these devices were low. A never wants to switch off devices, since these people can't switch on, on their own. There was a range of devices on display from Dynabox, Ipad, Amplifiers, Windows tablet. Ipad apps like Verbally, Assistive Chat, System Chat (text to speech) were used by these people. Ipad output is very low and needs amplifier as it cannot be heard in a dining room. Using a stylus was termed easier for Ipad users and they just use the inbuilt keyboard. Most of the phrases were stored in alphabetical order and not based on the frequency. There were a lot of menus to navigate in Dynabox to say a simple "Hi". Since these people really suffer a lot to create a sentence, if it turns out an error before completing the sentence, it really hurts them. These people use their eyes, small hand movements to select

their options on the screen. So a careful home page layout and easy customizable screen for every person was needed. And feedback/help buttons is a must on device used by these people. And these people hardly speak on their own for communication. It created a huge setback in our project. We initially planned to use these people voices for communication and helping them to avoid AAC gradually.

Date: 02-06-2013
Site: 2nd floor, Boston Home
Time: 11:30 A.M. – 12:45 P.M.

The second visit was well planned as we had to split into two groups and interview one person each. I had to interview R who was in mid-40, short and having a slim figure. He was operating the computer when I entered and was surprised to see me. I explained the purpose of my visit and he smiled. He said a proper "Hello there" like normal people. The person R speaks with amplifier and uses no AAC devices. He uses a left finger to operate the mouse as well as the keyboard. I asked him to use his computer.

He adjusted his wheelchair went near the mouse (a special kind of mouse designed for him) and moved it on the desktop. He was using the normal keyboard and desktop of Windows 7. He clicked on the Firefox icon and instead of double clicking it, he searched for the enter key on his keyboard. After a long search, he hit the enter key and the browser was open. He moved the mouse to the history button and clicked on it. During this action, he coughed heavily and was unable to control the mouse.

I asked him whether he needs a specialized keyboard and he replied 'No'. And also asked him about how he knows to operate a computer. For this the answer was special, "I learnt to use it on my own." I inquired whether he would like speech recognition software that accepts his commands and performs tasks. He replied "I would certainly want it." Since the door was open I could not hear his voice properly and he was struggling to speak longer sentences. He wanted to enquire something about me, but could not understand it. There was a universal intercom in every room, where caregiver can transmit a message to his patient. So his voice was too low due to these external noises. He even understood this and smiled.

Short sentences were clear and he takes a long pause to complete a sentence could be the inference of this observation. Regarding the software usage, we can build similar software like that of F involving speech synthesis to perform daily tasks. He certainly knows to use a computer since after any selection and hitting enter key is known to computer people. In fact he exclaimed happily when I proposed the speech synthesis software for performing his tasks. He also had large texts on his computer and this could be because of his near sightedness. Since he is comfortable in using normal desktop, he can be one of several people whom we can use to test the project prototype.

Implications for design:

- The system should be robust and customized to every person needs is one major observation. Since frustration and anger sets in if system is not working based on their actions.
- It should be simple and help them in communication as pointed out by one speaker in the group discussion. It need not do fancy things and just need to cover the basics.
- Another striking behavior exhibited by people who can speak through amplifiers was that, they do not want to use any AAC device for communication.
- So our target group now changes to people using Amplifiers since people using AAC were not able to speak completely. They completely relied on device for communication.
- We need to work on speech synthesis and it should help them to do some basic tasks like reading email and browse the web.