SE 542 Human Computer Interaction

Final Report

“LetsRead”

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Introduction:

In our daily life, technology recorded a big progress. Everyday a new invention is getting part in our life and this caused a effective competition at information technology area. Speech is one of the best feature as it is flexible, natural, economical and effective that took important part at Human Computer Interaction applications. LetsRead is really not just a simple desktop application it will be a good sample of HCI application. It is effective, efficient and enjoyable.

Motivation:

The existence speech based dictionaries are not so useful. "Lets Read" aims both touch and speec hinput together. All other speech based dictionaries do not suport two feature together. Also their userinterface are not clear, a bit complex and not easy to use.

Users:

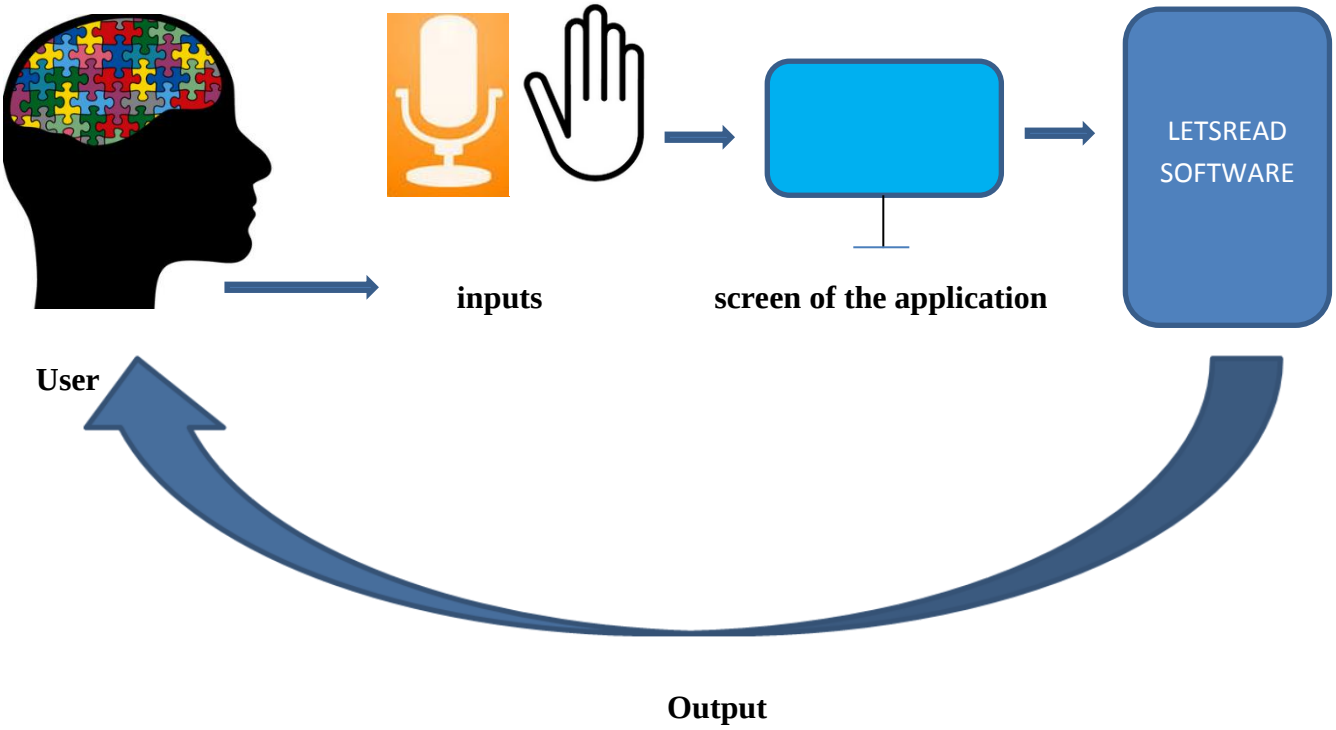
There is not an exact user group of the application. Everybody can use it. However the ones who are learning a foreign language use this application more. Also no need to be expert user, the one who knows how to click or scroll a page, can easily use the application.

Design:

While designing the application low fidelity prototype is developed firstly. I thought main part of the screen as a pdf will be take part. At the left side there will be voice-frequency graph, cursor will be on the middle at first, and then user will be able to move the cursor to the position which he desires. On the left side there will be a "Search" button. When user selects a word or a sentence it will be active. If the user desires to control the application by just using voice, he/ she clicks on the "Start Voice Reading". Then application starts to be aware of voice to be as input and the graphs starts to show frequency as colored. Also there will be a left/right side icon which will move the function panel left or right for different users. There will be also timer for the users to show them how much time they spend for reading. Meaning of the word will be under the reading part. There will be scroll bar, also there will be page number indicator.

General Structure of the Application: User sends input by touch or by his own voice with the help of microphone and the screen. Enviroment voices and the difference of pronounces of the users will be considered while completing the application. Then application's software

recognizes the voice and finds the coresponding meaning of the word. Returns its result as output.



First screen design as a low fidelity:

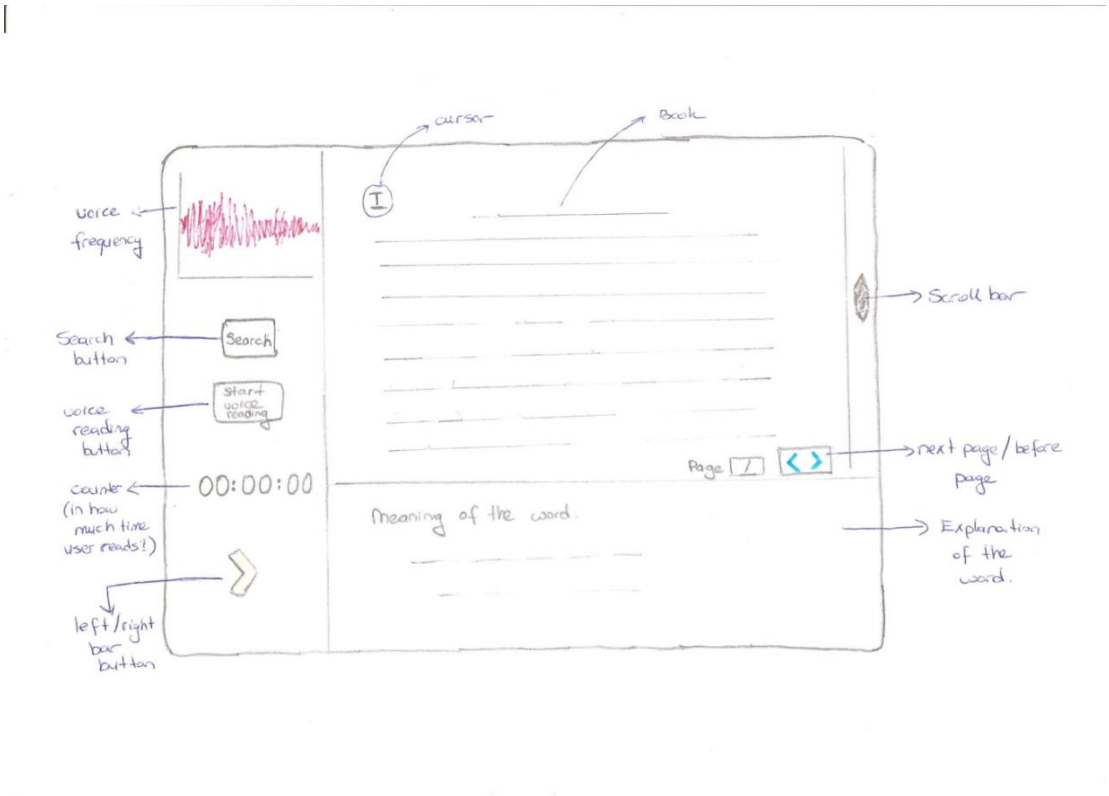


Figure 1: Low Fidelity of the application.

While designing the application, I considered some design principles like:

Feedback: If the user does not upload a file and tries to pass next page application warns the user. Also when user uses his own voice as input and says the commands, o small identification window appears that application is aware of the commands. Also frequency graph gives feedback to the user. When the user selects a word or sentence, it highlights as in yellow color.

Visual Affordance*:* "search" button is to make some search, "Start Voice Reading" button is designed for user to start to control the application by his/her own voice. Scroll bar is designed for user to slide the page from up to down or vice versa.

Visibility: Application userinterface is clear and easy to use. It gives clue how to use, which button does what. It gives main idea of the application.

Conceptual Model: It supports what users think and they imagine before start to use the application.

Mapping: My project also is a good example of mapping. Next page or previous page icons are clear and user understands easily what will be if he/she clicks on it.

Also LetsRead application based on some usability goals like:

Easy to learn: userinterface of the application is clear that users do not confuse hoe to use it. All the things are based on user's expectation.

Easy to remember how to use: After using once, users do not forget how to use as it has simple view.

Some other concepts that are considered while developing the userinterfaces of the application:

After on a paper based thinking, I started with designing first step of the application. The first page that where user uploads a .pdf:

Figure 2: First page where user uploads file.

Other screen shots of the application are like below:

Figure 3: After loading pdf, screen is ready to use.

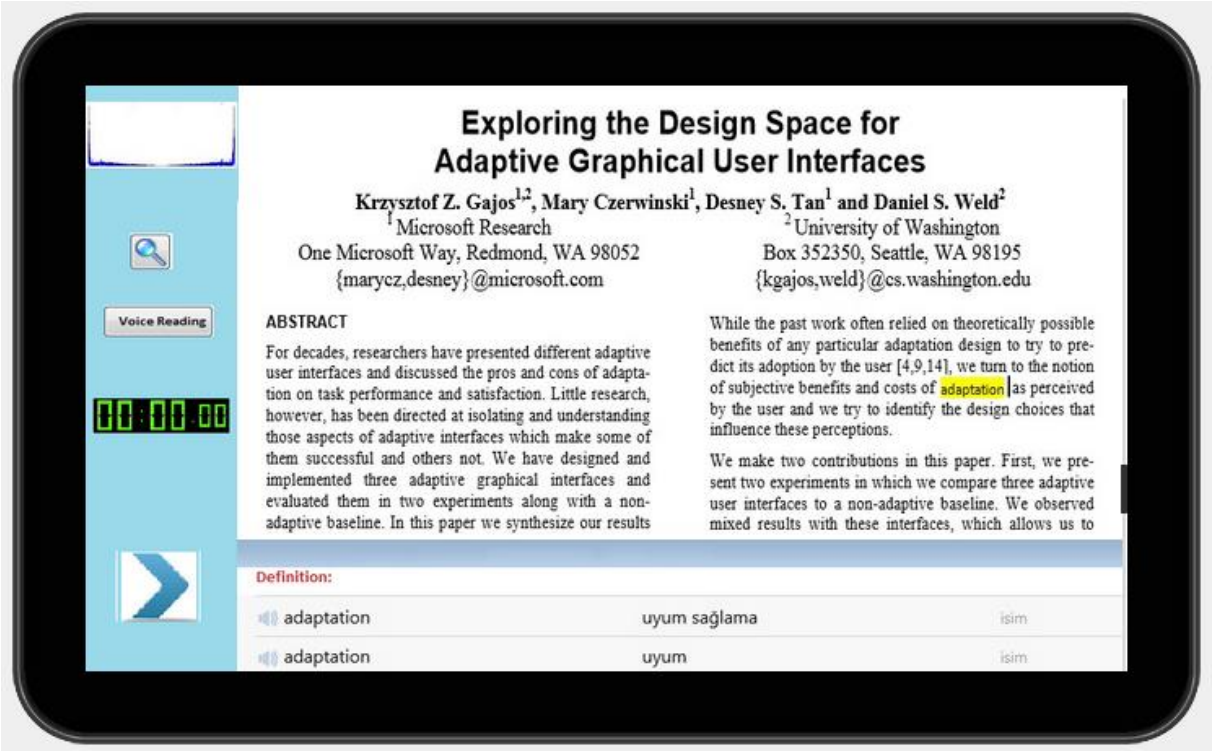


Figure 4: After selecting a word and searching it's meaning

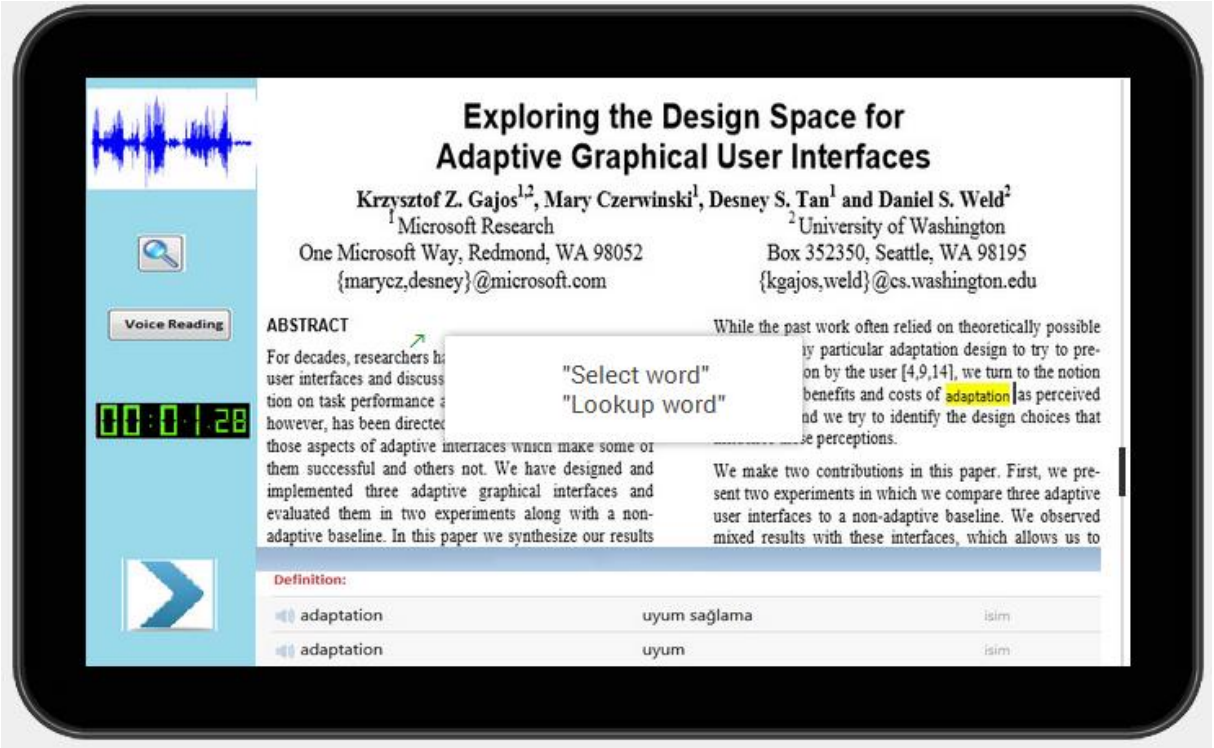


Figure 5: After choosing with voice control, graph and comments are shown to user.

User Evalution:

User evaluation is done on the prototype of the application but the coding part will be completed soon. For the evaluation I did three experiments with the application and after each experiment a survey is given to the users. Experiments are done among 5 people. An instructor at university(55), a retired bank manager(51), a machine engineer(38), a computer engineer(32) and a chemistry student(23).

Users:	**User group**	**Age**	**Gender**	**Usage of any kind of touch or voice inputed application**
Instructor	Expert	55	male	yes
Bank Manager	Casual	51	female	no
Computer Engineer	Expert	38	male	yes
Machine Engineer	Expert	32	male	yes
Student	Intermediate	23	female	no

Experiment #1: In this experiment only "*touch"* feature is given with the application. All the users read an English short story about 400 words with unknown words, when the reading is completed, each user's reading time is calculated and a short quiz of the reading story is given. Results of the first experiment:

Users:	**Reading Time(minutes)**	**Selected and searched number of unknown words**	**Number of Correct answers out of 10 for the quiz**
Instructor	30	12	6
Bank Manager	40	20	4
Computer Engineer	20	16	8
Machine Engineer	25	15	7
Student	27	22	5
Average	28.4	17	6

Experiment #2: In this experiment only "*speech"* feature is given with the application. All the users read an another English short story about 400 words with unknown words after reading each user's reading time is calculated and short quiz of the reading story is again given. Results of the second experiment:

Users:	**Reading Time(minutes)**	**Number of voice sent for unknown words**	**Number of Correct answers out of 10 for the quiz**
Instructor	25	10	4
Bank Manager	45	18	4
Computer Engineer	30	12	6
Machine Engineer	27	14	7
Student	30	32	2
Average	31.4	17.2	4.6

Experiment #3: In this experiment *"speech" and "touch"* feature is together given with the application. All the users read an another English short story about 400 words with unknown words after reading each user's reading time is calculated and short quiz of the reading story is again given. Results of the third experiment:

Users:	**Reading Time(minutes)**	**Number of voice and click sent for unknown words**	**Number of Correct answers out of 10 for the quiz**
Instructor	20	8	7
Bank Manager	38	15	6
Computer Engineer	18	10	8
Machine Engineer	20	13	9
Student	25	20	6
Average	24.2	13.2	7.2

Survey:

Survey Questions	Instructor	Bank Manager	Computer Engineer	Machine Engineer	Student	Total Results
Could you please prefer one of the application according to their "Usability"?	first	third	first	third	third	**First:2 Second:0 Third:3**
Which application was the fastest at reaching unknown words?	third	second	first	third	third	**First:1 Second:1 Third:3**
Which application was easy to use?	first	second	third	third	third	**First:1 Second:1 Third:3**
Would you like to use this application?	yes	maybe	yes	yes	no	**Yes:3 No:1 Maybe:1**

Conclusion:

Maybe 5 people is not enough to reach an exact result but gives the main idea of the application. All the experiments results show that both speech and touch features has more effective role. Application is not successful enough if it takes only one feature as input. The calculation time of reading and the number of correct answers and also survey results show that both voice and touch is more succesful.

As a result speech and touch based application are getting important part in our life. Most of the users prefer using these applications. They are useful and very good example of human computer interaction. In the future there will be more applications which uses speech as input. People will use this kind of applications more.