

Contextual Inquiry Report

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CSE 440 HCI Spring 2011

Roles

Group Manager - Angie Zhu Design - Happy Dong Documentation - Tim Clark Testing - David Truong

Overview

Research has shown that there a strong correlation between the amount of understood words in a reading and the reader's comprehension. With that said, it is currently difficult and inconvenient to look up words and concepts during reading. This usually means either getting a dictionary or using the Internet. The inconvenience is great enough that readers often ignore words which reduces overall reading comprehension.

We propose a mobile application that will integrate the look up experience with the reading itself. This application would overlay directly on the reader's text and provide an easy and convenient interface for quickly getting to this unknown information. The application would also draw from multiple sources to able to look up anything from simple word definitions to concepts and even suggest further reading to make reading easier and more comprehensible for customers.

Contextual Customers

To learn more about people's reading habits, we decided to interview and observe different types of readers using contextual inquiry. Before we selected our potential contextual inquiry candidates, we grouped possible reading materials into three categories: casual reading, academic reading and foreign language reading. With those different kinds of reading in mind, we selected three people with very diverse reading needs that fit into one of the categories. We tried to interview the subjects while they were engaged in their respective types of reading.

All of our subjects are at a college level. We focused on this group of readers because of the diversity and challenge of the reading done in higher education. Understanding reading is critical in a student's success in college. This is also where some of the most technically challenging reading occurs.

James is an undergraduate sophomore at the University of Washington. Even though he is of Japanese ethnicity, James is born and raised in America so he does not know or speak the language very well. In order to be more proficient in Japanese, James has been taking Japanese classes at the university, and he frequently reads books in Japanese to build a bigger Japanese vocabulary. We thought James would be a representative of the user group who are learning and reading in a foreign language. We observed James while he read his Japanese textbook in one of the breakout areas in the Paul Allen building. James often reads there since he has a couple classes in the Electronic Engineering building which is nearby. The breakout area is relatively quiet but it still allows us to talk. During the contextual inquiry, we asked James to read a passage in Japanese and look up any word that he did not know. We also interviewed him to learn more about his reading habits, and the difference between foreign language reading versus English reading.

Timmy is a recent graduate of the University of Washington's Computer Science department who now works at Microsoft. He immigrated from Taiwan at the age of 16, and started learning English at the age of 11. He has been reading English novels since the age of 13 and now enjoys reading English nonfiction for leisure. We observed his practice in a living room, a common environment for leisurely reading. Timmy was an ideal target audience because he learned English as a second language and frequently reads in English to better his understanding of the language. He represents the ESL (English as a second language) user group, as well as the users who are proficient in English and simply read for leisure. Our role as the apprentice during Timmy's contextual inquiry was done by allowing Timmy to read through a novel in English, and having him take us through his thinking process while he debates whether or not the word is worthy of taking the time to look up in the dictionary. We then asked him to read an article online and had him walk us through his thinking when he encountered words he did not know.

Jeff is a computer science researcher who works in a graduate student lab at the University of Washington. He often reads dense text related to research topics which often presents new concepts and terms. We chose to interview Jeff because we wanted to learn more about the high level academic setting where reading new material is constantly prevalent. The interview took place while Jeff was reading a research paper published at the CHI conference. During the interview, we asked Jeff to walk us through the process as he read the research paper. As he read through the paper he talked about what he was thinking and what his thoughts were when he came to sections that were hard to understand. When Jeff made comments about not understanding a certain word, we asked him what he would do in that situation. He explained to us the process of what he would do in different situations where he didn't understand a word or term.

Contextual Inquiry Results

Mobility

From our contextual inquiry, we also discovered that different people like to read at different locations. Timmy finds himself reading when he is taking the bus, waiting at the dentist's office, or during a flight. Similarly, Jeff likes to read on the bus on his iPad. On the other hand, James varies his reading location depending on what he is reading. For casual, leisure reading, James often reads in bed, before he goes to sleep. For more serious reading, he finds a quiet place outside to study. As can be seen, mobility is extremely important to readers, and the location of reading is highly specific to one individual. This discovery made us think twice about using the Surface as a potential reading device. Even though the Surface is ideal for user interaction, it is too large in size and impossible to carry around. However, smaller electronic devices such the iPad or Kindle make reading more flexible. Readers can carry their electronic books anywhere and do their reading at any comfortable location.

Accessibility/Convenience

In the academic setting reading, knowing the definition of words is very important to understanding the content. From the contextual inquiry we found that even researchers do not even put in the effort to look up words unless absolutely necessary. We found that Jeff would rather continually read over the text and decipher the context and skip over the word than look up the word. However guessing a definition is not as effective as looking up the word, since the actual definition provides additional contextual information. The reason that Jeff would rather try and guess the word than look up the definition is for convenience. Jeff said that the hassle of having to go to an external resource such as a dictionary or the Internet, slows down his train of thought. Often the context of the reading is forgotten in the time it takes to look up the word elsewhere. We then asked Jeff if it would be useful if there was an application that allowed him to read his documents and look up definitions directly in the application. He said that although it would be useful, he wouldn't use it as an since it would require him to open his documents in a specific application. This made us think that we should provide ease of use by having our application overlayed on top of every application allow users to look up words in their own application.

Memorability

From Timmy's contextual inquiry, we discovered that although flipping through pages in a physical dictionary can be tedious and can sometimes discourage him from looking up words, he tends to remember words more easily through this method over looking up words in an online dictionary. Online dictionaries provide a faster response to looking up words, but due to their extreme efficiency,

he tends to look up the word, understand it temporarily for the context of his reading, and then move on. With physical dictionaries, he tends to try harder to remember the definitions of words so he won't have to go through the hassle of flipping through dictionary pages again. A possible solution for this dilemma is to keep track of the history of words users have looked up so that users can look back on the list of words they did not understand.

Content-focused

From the combined results of all of our contextual inquiries, we decided to focus on English reading due to the significant difference between English reading and foreign language reading. Our contextual inquiry customer James revealed many details involved in reading in a foreign language. While reading text in a foreign language, simply looking up new words and translate them in English is not enough. He often has to consult grammar and sentence structures in order to fully understand a sentence. In addition, foreign language learning also requires pronunciation learning, ability to translate within context not directly, acquisition of special usages of certain words, and understanding of the cultural background. Therefore, foreign language reading does not fit into the scope of our project very well, and we want to shift our focus towards English reading. For English reading, it is essential for readers to understand the context and learn about a particular subject. We want to enrich the reading experience and improve reading efficiency by integrating actual reading text and supplementary materials together to increase readers' comprehension of the contents.

New And Existing Tasks

Easy Task - Looking Up A Word Definition

Jaimie is a 20 year old college student taking an English class. She is assigned *The Tempest* by William Shakespeare. As she is reading Act 2, she comes across the line, "Nor lead me, like a firebrand, in the dark...". After reading the line multiple times, she does not understand what "firebrand" means. She wants to make sure she understands the passage fully as she has a summary due the next day. Jaimie would like to figure out what the word means, ideally without having to pull out a dictionary or move over to her computer and interrupt her reading.

Jaimie represents a basic reader that often comes across unknown words. It is important for her to understand her readings, so ignoring the unknown words is not an option. This means that she must look up the words definition in a dictionary.

Medium Task - Finding Information on a Concept

Jason is a 19 year old Computer Science student. He is taking his first 400 level class, which is Compilers. While reading through his compilers textbook, he comes across a brief section on context-free grammars. In this section he sees the term Backus-Naur Form (BNF) referring to the construction of these grammars. While the book gives a definition of BNF and a very brief explanation, Jason feels like he could use a better understanding of it in order to understand the language constructions in the book. He does not want to go out and buy a complete textbook on the subject, and would like a way to easily learn the basics without having to divert too much attention from his textbook.

Jason decides to put down his textbook and use his laptop to research the subject. He starts from typing "Backus-Naur Form" into Wikipedia to get a more in-depth explanation of BNF. Ideally, Jason wouldn't have to leave his textbook reading to get this information. The task-switching distracts him from the current topic and ends up, due to having to move to his laptop, taking much more time than he would have liked. Jason is the type of customer that does more than basic reading and needs something beyond simple definitions.

Hard Task - Researching Relevant/Similar Works

Gabe is a 25 year old graduate student in Psychology. He is doing research on Social Cognition (the processing and storage of social information.) He is reading an electronic copy of *Intentions and Intentionality: Foundations of Social Cognition*. After finishing the text, Gabe wants to do additional research on the subject.

Gabe knows he could turn on his computer and type "Social Cognition" in Google. He might find relevant articles and books on the subject. Knowing that lots of the results might be superfluous with a simple search, Gabe also checks the University of Washington online catalog for books on the subject. Gabe represents a customer that could use assistance with something beyond reading concepts; the finding of additional related book materials.

UI Sketches

Each of the designs uses a panel at the bottom of the page to see more information regarding the word/phrase the user wants to look up. The panel is scrollable -- the user can scroll to view previously searched words/phrases. Tapping outside of the panel or context menu returns the user to reading mode.

1. Context menu invoked when user presses and holds on a word/phrase. Context menu contains an option to expand the view into a panel, where the user can see more information regarding the

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Reading Material

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Definition of the word, Word used in a sentence, Roots, pronounciations, etc.

Even more information about the word/phrase

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Scrollup to see previously looked up entries

3. There is a magnifying glass at the bottom right corner of the page, and the user can use the magnifying glass to "look up" words/phrases by dragging the magnifying glass over text in the reading material, and the panel will be invoked with information regarding the magnified word/phrase.

Reading Material

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Definition of the word, Word used in a sentence, Roots, pronounciations, etc.

Even more information about the word/phrase

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