LookUp

Task Analysis Report

Tim Clark, Happy Dong, David Troung, Angie Zhu

Roles

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

Problem and Solution 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.

Task Analysis Questions

Who is going to use the system?

Ideally, our application can be used by anyone who reads and is able to use this application. However, from our contextual inquiry results, we decided to aim towards people who are reading at a college level. These readers will gain the most benefit from an application that assists in reading comprehension as this is usually when understanding the reading is the most critical.

What tasks do they now perform?

From our contextual inquiry, we learned that people use different tools to look up unfamiliar information while reading. It showed that this lookup varies greatly upon personal preference. For instance, Timmy prefers to use a physical dictionary to look up words he did not know. He enjoys this method because the process of looking something up helps him remember the word better. Jeff, who is a computer science researcher, generally avoids looking up terms because it slows down his brain process.

What tasks are desired?

- Look up word definitions
- Find additional information on a concept, idea
- Learn and memorize previously looked up items
- Find other relevant works on a specific topic
- Save looked up items for review

How are the tasks learned?

The tasks we will support are all naturally learned. They involve tasks that readers have learned throughout their lives, done in a different way. This means that users will not have to have any assistance beyond in-app help that will help readers navigate initially.

Where are the tasks performed?

Our application will be an iPad application. Because from our contextual inquiries, we learned that people read at different locations, such as at home, on the bus, at a library, or in a waiting room. It is important to make reading materials accessible to users. Readers can take their iPads anywhere and read whenever they feel convenient to do so. This means that our tasks will not be restricted by location. And even though the iPad is the ideal device for this application, this could easily be ported to a mobile phone at a later time.

What's the relationship between customer & data?

Word definitions generally are not considered sensitive data. All of the reader's information will be stored locally on their device and will not be stored on any servers. The customers will also be given an option to back the data up in case they are worried about losing it.

What other tools does the customer have?

Readers have other tools to look up information. They can use search engines on the Internet, the dictionary, the encyclopedia, the library, and other related texts.

How do customers communicate with each other?

Reading is primarily done independently. Readers will not benefit from sharing words when their list of known words will not directly intersect with another reader's.

How often are the tasks performed?

It varies for each individual. For college students and researchers, they would read at least a few times per week. The benefits of the app could, however, be used for anyone that reads even rarely to someone who reads many hours a day.

What are the time constraints on the tasks?

There are no time constraints on how long a person reads. Any reasonable amount of time from a few minutes to a couple of hours was shown to occur in our contextual inquiry.

What happens when things go wrong?

If our application fails to provide readers with the correct information, then the user might not be able to understanding his or her reading material correctly. In that case, the user will either not look up anything and rely on making educated guesses, or they can fall back on their previous methods of looking things up such as using the Internet, the dictionary, or attempting to figure words out in context.

Revised Tasks

Finding A Word/Phrase Definition

Looking up a word or phrase in the text will be the most common and easiest task to perform. This will enable a reader to define any unknown word or phrase in a text and add the word or phrase to a history of those that were previously defined.

Reviewing Past Words

One of the things we discovered through our contextual inquiry was that readers wanted to not only find the definition, but to be able to remember them in the future. A reader that looked up a word quickly to understand the context did not retain these definitions in memory. This task will provide a method to search through previously defined words or phrases as a history for review. It will also allow curious readers to see an aggregate of the words that they struggle with.

Taking Flashcard Quizzes

College students often do readings as part of class. Quizzes based upon specific pieces of the reading are common. This task will allow a reader to save words and phrases, and create a "flashcard" quiz out of them.

Through this a reader can select important pieces of the reading and is able to collect all of this information in one pass. There will be multiple quiz methods to allow for the diversity in learning styles present among readers.

Storyboards

Running in the Background/File Centric

This interface storyboard shows an example UI that is based around being invisible until used. It would automatically start up when the user swipes down when any reading file is opened on the device. The menus, options, and other tasks would only be present when a reader selects a block of text. The application would track reading in a file-centric manner. Selections for quizzes or history would automatically be selected based upon the current reading selection.
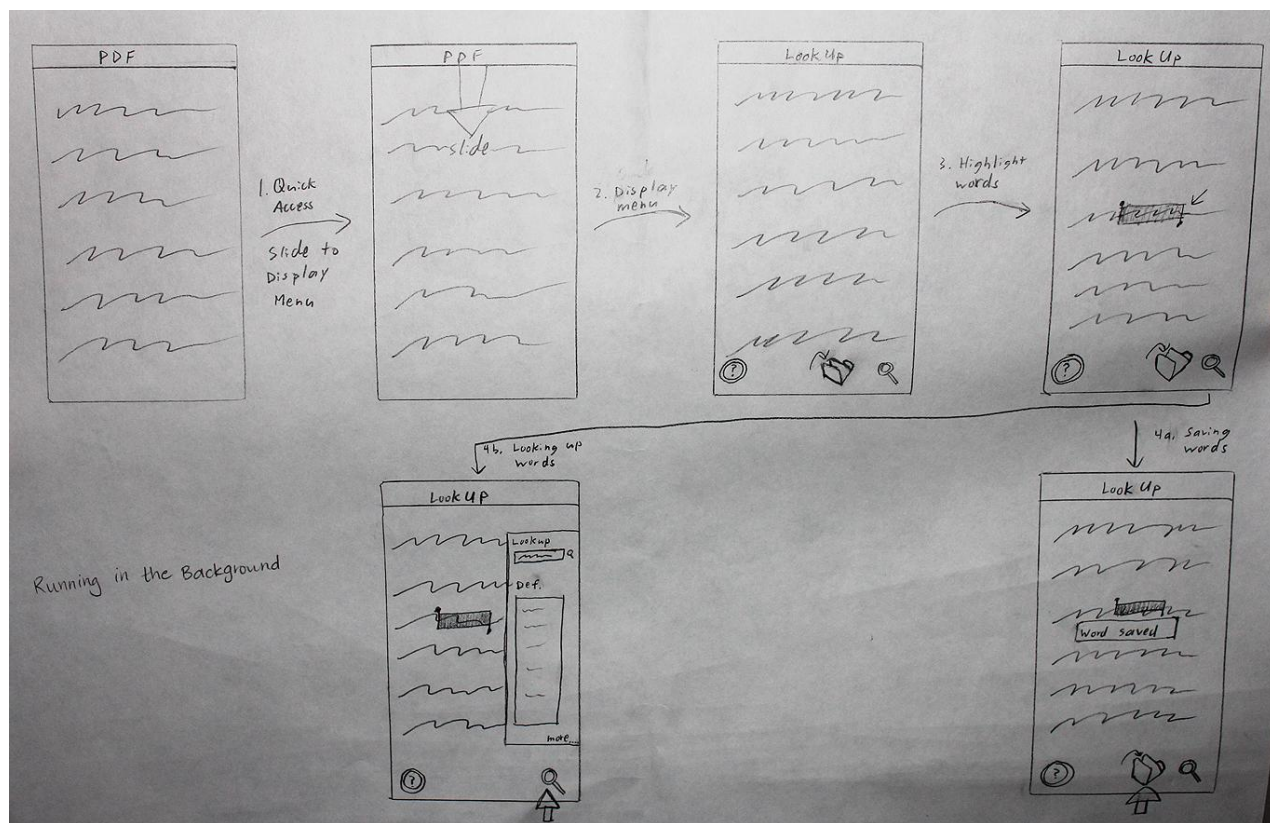

Figure 1: Running in the Background/File Centric Storyboard

App Centric

This design is based around being within the app the entire time like a classic iPad app. A user would start the app, and be able to access all of the functionality through the main menu. The user can select the files to be read or browse the internet, review the history of words/phrases looked up, and
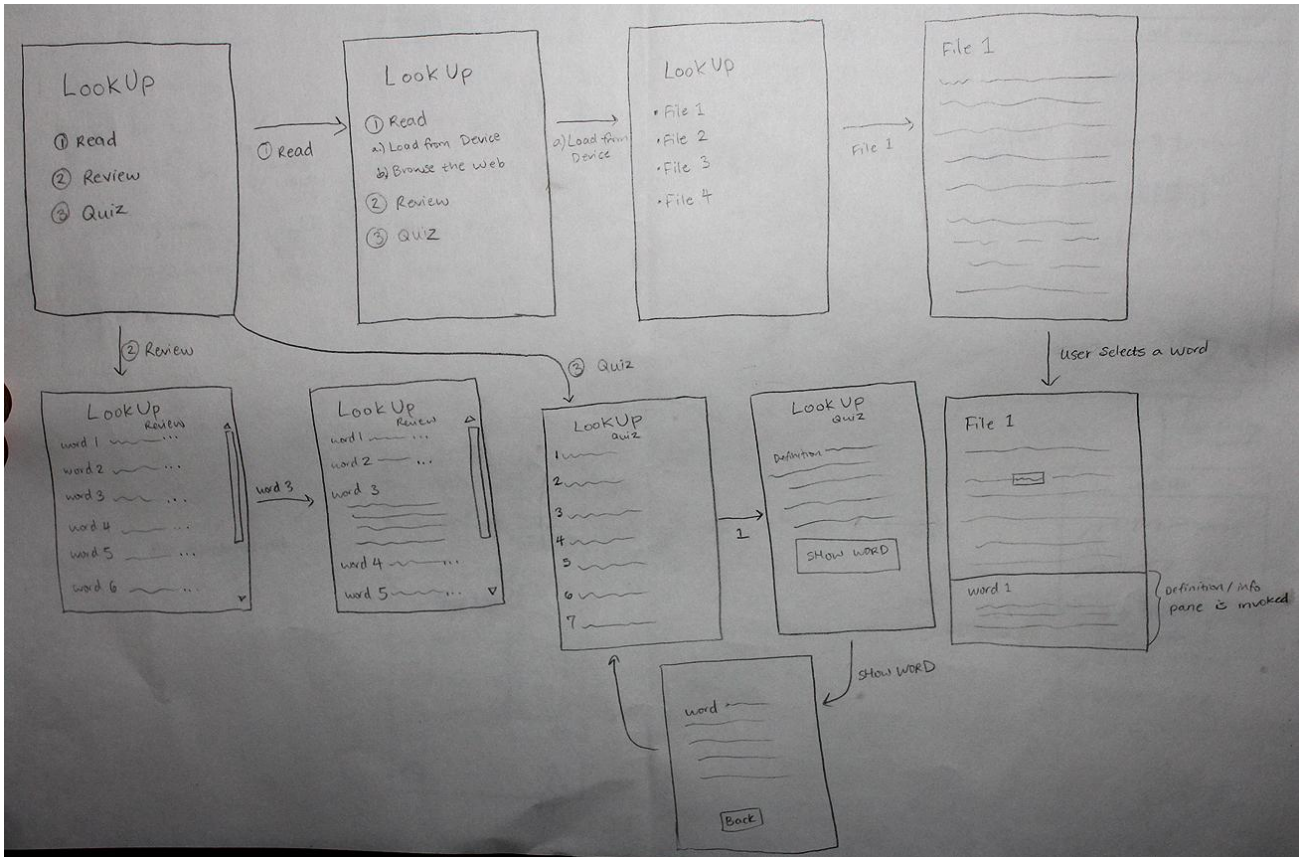

Figure 2: App Centric storyboard

Hybrid/Mode Based

This design would be a hybrid of the previous two. It would allow a reader to select a "mode" in which to run the application. At the startup screen, they could select the app to be run in the background. Alternatively, the reader could access the other task modes within the application.
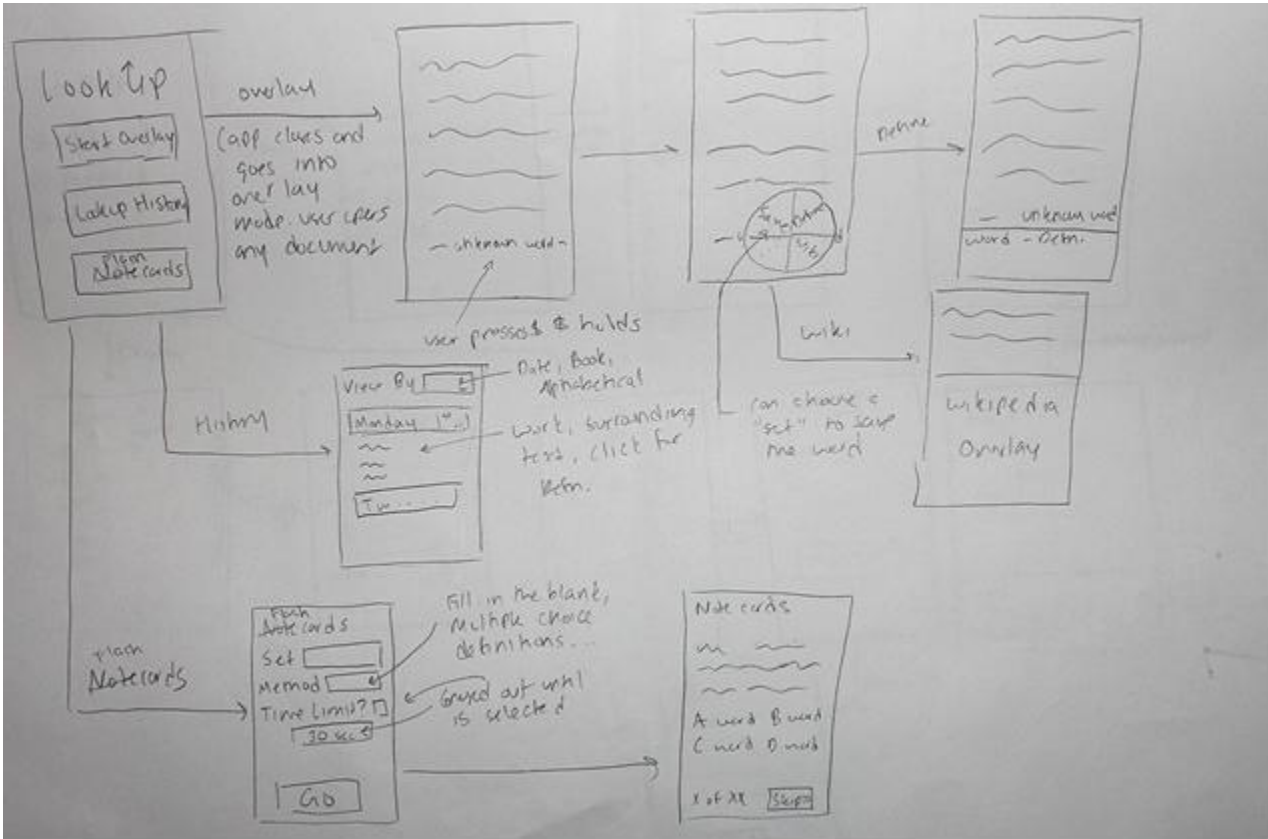

Figure 3: Hybrid/Mode Based Storyboard
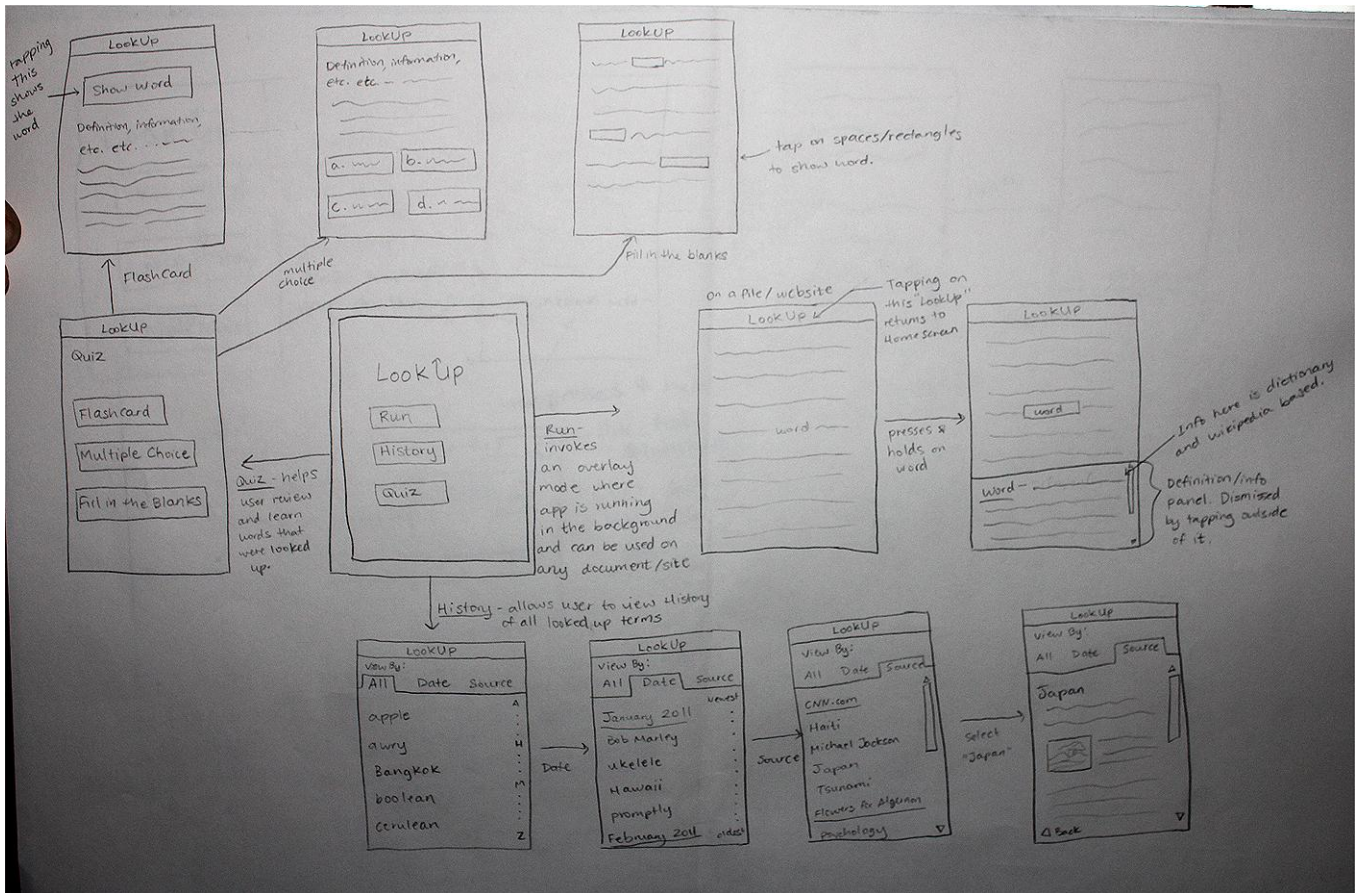
Selected Interface Design

Figure 4: Chosen Design

Which Design/Rationale

We decided to go with a hybrid design model for our application which utilizes features from each of our separate designs. One of the core features that we wanted to emphasize was the capability to have the application running in the background and usable whenever necessary. The mockup of the File/Background Centric design focuses on the quick nature of always having the lookup feature available when needed, however it did not provide a good central location the user could land on to access all of the app's other features (like the Quiz mode). The App Centric mode provided an adequate home screen, but required too many in between steps for the user to start browsing files and the Internet upon launching the app (The file selection screen, for example, was an extraneous step). Ultimately, our final design is closest to the Hybrid design because it allows the user to have the

convenience of having the app run in the background without sacrificing the organization and discoverability of a centralized home screen so the user can access other features of the app.

We debated between two methods of looking up a word:
1. The App-centric's method of pressing + holding on a term to invoke the information pane.
2. The Hybrid and File centric's method of pressing + holding on a term and then selecting "Define" (in the Hybrid model, this is done through tapping on the Search icon).

In the end ,we decided to go with the first method because it is faster and requires less in between steps for the user to get from detecting an unknown word to reaching the word's definition. Also, having different options like "define" and "save" the word proved to be potentially confusing to the user (Does define automatically save the word or are the two options exclusive?), so we decided that looking up a word automatically saves it as part of the history. Reviewing words was easier if they were automatically saved in a history rather than manually saving every word that we wanted to look at later.

Functionality Summary what you can do with it
- Look up words
  - Interface for looking up words
  - Capability to overlay display onto any application
- Capability to save words
  - Save full history of used words
  - History of words are categorized
    - By Date
    - By Source
    - Alphabetical
- Quiz Mode
  - Flashcards
  - Multiple Choice
  - Fill in the Blank

Interface Descriptions
The interface of the application allows users to access different features of the application with ease. The start screen of the application gives the user the option to select between what feature they want to use. The main features of the application include running the application in the background, viewing the history of recently looked up words, or reviewing words in a quiz format. The run feature of our application allows for the user to turn on the overlay feature which lets the user look up words in any application. When the run feature is selected, the user can then browse through any number of

documents whether it may be a PDF, a web page, etc and open up the word definition in the information panel. The user reads as he or she would normally and would interact with LookUp whenever needed. When the user comes across a word he is unfamiliar with and wants to look it up, he just presses and holds the word which opens up the information pane. From the information pane the user can scroll through the definition of the word. If the user wants more content, the user can see more information by switching the content displayed to other sources such as Wikipedia. Every word that is looked up is saved to be viewed later on in the history.

The history feature can be accessed from the main page of the LookUp application. In the history feature of LookUp the recently used words are categorized in three ways:
1. All - which lists all of the terms sorted alphabetically, so the user can easily and quickly locate a specific term he/she is searching for.

2. Date - which categorizes words in the order they were looked up (most likely separated by months), so the user can look back on the terms he/she looked up in relation to their recentness.

3. Source - which lists all of the terms looked up by the source where they originated (sources are listed alphabetically), so the user can look for their terms based on context of the terms' source.

The user can select which filter option to use to find the definition of their previously looked up word through the top tabs shown in the diagram.

Additionally the Quiz mode is used to help users learn the definitions of words better. The Quiz mode allows for practice of word in context through the various learning methods presented. There are three main modes the user can choose from in the quiz section:

1. FlashCards - This mode shows the term's definition (and a summarized information if applicable) and hides the term behind a button called "Show Word". The user can look at the definition and make a mental guess, and press the "Show Word" button to reveal the word. The terms are given at random order, and the only way to progress to the next word is by selecting "Show Word".

2. Multiple Choice - This mode is similar to FlashCards in every way except instead of having a button that conceals the word, the user is presented with four choices of words to select from. After selecting a choice, the user will be able to see if he/she made the correct guess. The other choices for words will be other terms the user has looked up (from the same source, if applicable).

3. Fill in the Blanks - This mode is beneficial for a user who has looked up many terms from one source. Essentially, the app will give the user a screenshot of the source (either a file or a website), except all the terms the user has looked up will be blocked with rectangles. The user can make a mental guess of what should be in the "blank" spaces, and tapping on the rectangles will reveal the term behind them.

Scenarios

Below are three scenarios demonstrating how readers could use our application to better learn from and understand their reading materials. The three scenarios encompass all of the main features that our application offers, and all scenarios are developed based upon our contextual inquiry results.

Look Up a Word

Claire is an 18 year old college freshman. She is taking an intro Psychology class, and was assigned a paper on learning theory to read before the next class. She decides to do this reading on the bus on her iPad. Knowing that the reading is fairly high level, she starts LookUp and presses the "run" button before opening up her assigned pdf.

During reading, she encounters an unknown word, "hypothalamus". She presses and holds on "hypothalamus" on the file. An information/definition pane slides up from the bottom of the screen and displays the definition of "hypothalamus" along with some supplementary information regarding the hypothalamus (acquired from Wikipedia). After looking through the information from the information pane and figuring out the context using the definition, she taps outside of the definition pane to dismiss it.

Review Previously Looked Up Items

Josh is a chemical engineer who has been working for a few years, and he just got married to Brittany earlier this month. While enjoying their new lives together, Brittany and Josh are planning to take the next step and buy a house since mortgage interest rates are very low in the current market. This weekend, Brittany has to work overtime, and Josh decides to do some research on mortgage borrowing and the home-buying process.

Josh starts browsing through financial websites on his iPad for mortgage related information, and quickly he is overwhelmed by the amount of information and technical terms associated with taking out a loan. To help him understand those terms, Josh launches "lookup" and the application runs as an overlay app on top of the websites that Josh is looking at. Whenever there is a new term that Josh did not understand, he touches the word with his index finger and holds until a definition box pops up on

the bottom. With "lookup", Josh is able to quickly learn mortgage related terms such as APR, property tax, ARM loan, FHA loan, etc. After a couple hours, Josh feels that he has gained a better understanding of what takes to own a house, and he also has got a better idea of the current real estate market. Buying a house is a big decision, and Josh wants to share the information that he learned today with Brittany when she gets home. With "lookup", Josh can easily review all looked up terms and print them out. To do so, Josh returns to the "lookup" home screen. He selects the "History" button which takes him to all the previously looked up items. Since Josh only wants to print out the terms that he looked up today, he taps "Date" to sort all looked up items by dates. Finally, Josh chooses today's date and he is able to view all the information he looked up today. Josh proceeds by hitting "Print" and he is ready to share his findings with Brittany when she gets back.

Quiz Yourself Over Learned Words

Xavier wants to prepare for an upcoming history exam on the Civil War. After starting LookUp, he reads various articles online regarding different battles and important names of generals/politicians of the time. He uses LookUp to find out more information regarding many of the unknown names, places, and events. The terms he looked up are automatically stored in LookUp's history, as well as the Quiz option.

To make sure he remembers and learns all of the unknown terms he had looked up, Xavier goes to LookUp's home screen and selects the "Quiz" option. There, he finds three different options to quiz himself over his terms - FlashCard, Multiple Choice, Fill in the Blanks. He tries out the first option, FlashCard, which randomly shows the definition and information summary of one term at a time, with the term itself hidden. When he is finished reading through the definition/information and making a mental guess as to what word/term matches the definition, Xavier has an option of tapping a button that says "Show Word", that will reveal the hidden term, allowing Xavier to see if his guess was correct. He then tries the second option, "Multiple Choice", which is similar to "FlashCard", except instead of having a "Show Word" button that hides the word, Xavier has the option of choosing the correct word out of four possible choices. The last option is "Fill in the blanks", which essentially shows a screenshot of one of the files/sites he looked up words from, with the words that he looked up hidden beneath rectangles. Xavier can make guesses about which terms go in the "blanks" based on the context of the reading material, and when he is ready to check on his guesses he can tap on the rectangles to reveal the word.

After using these three methods of testing his knowledge, Xavier is better prepared for his history exam.

Appendix – Extra Images

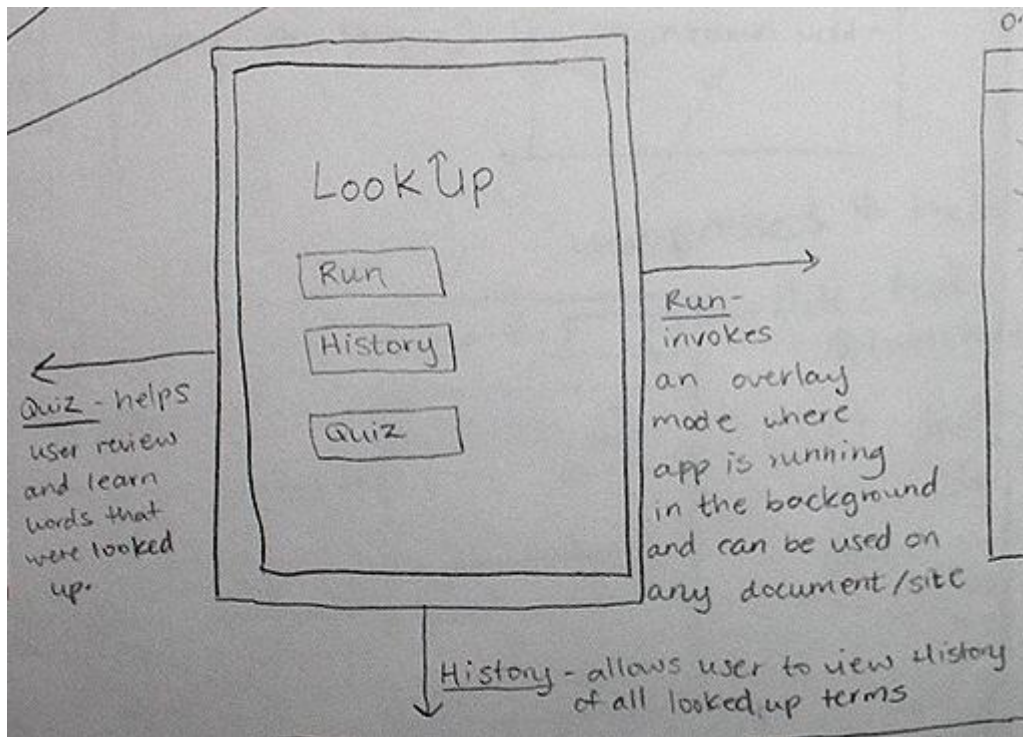Detail sketches of different screen.

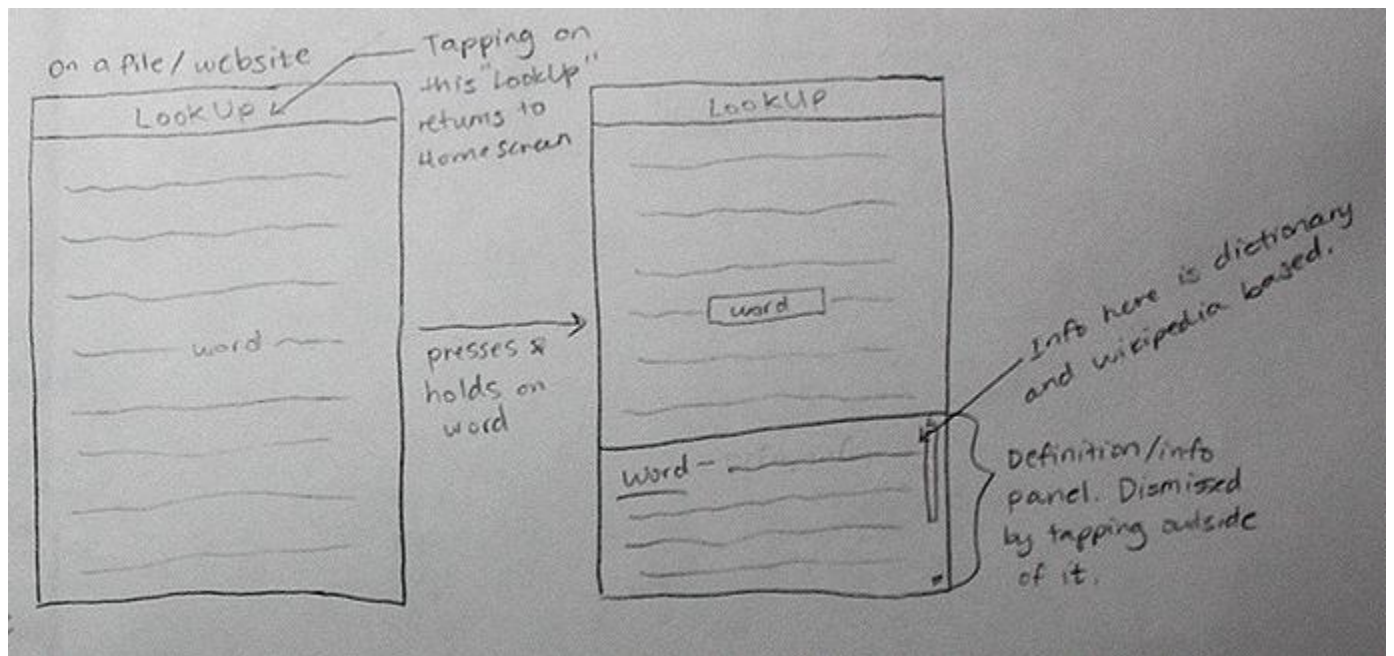Figure 5: Home screen

Figure 6: Basic look-up mode

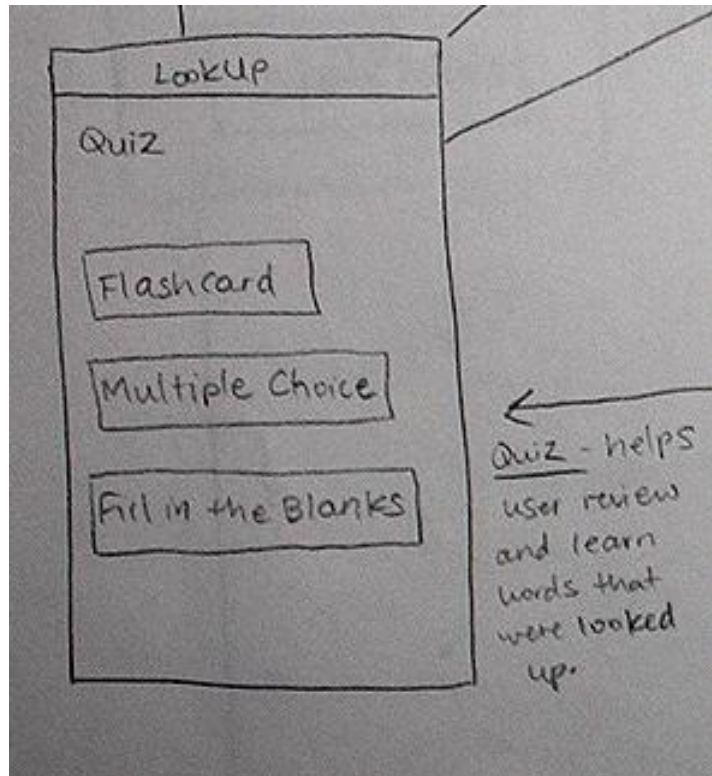Figure 7: History mode, ability to sort looked up items by all, date, and source
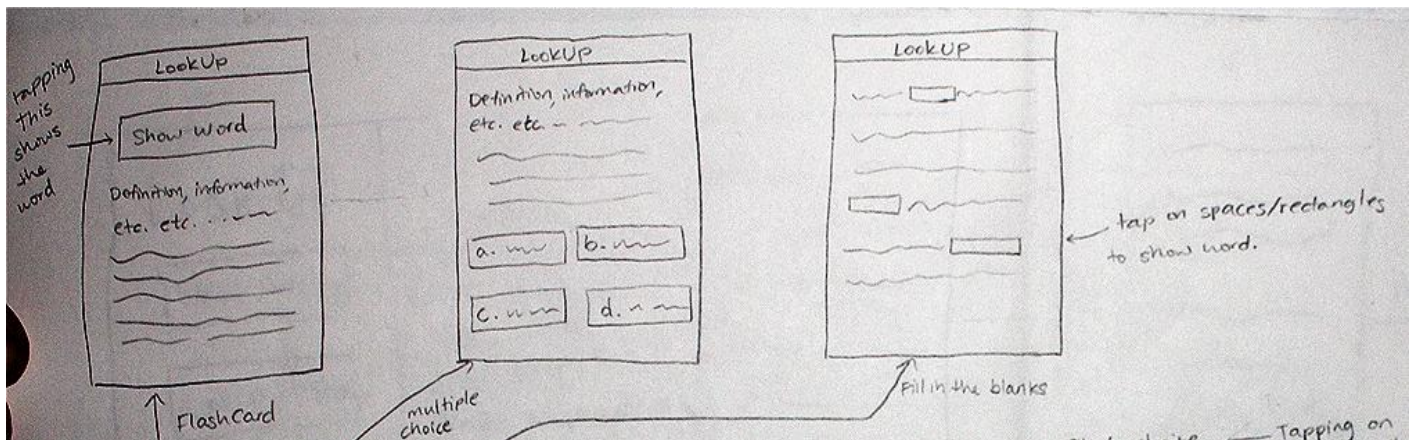

Figure 8: Home screen for quiz mode

Figure 9: Different ways to quiz the reader