

*Wonderlust*

# HIGH-FI PROTOTYPE

*December 6, 2014*

CS147

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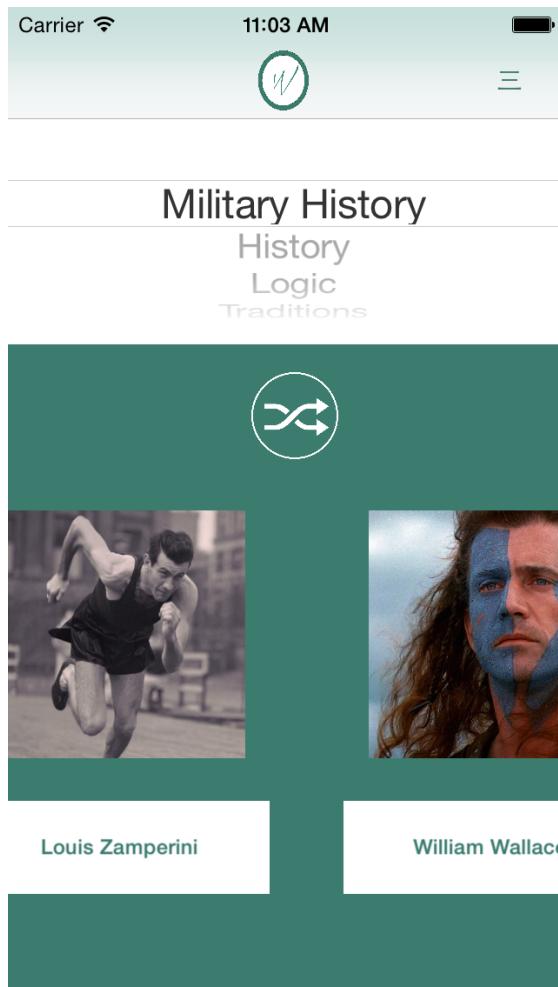
## VALUE PROPOSITION

*Wonderlust harnesses, enables, and rewards our impulse to learn about the world during snatches of otherwise wasted time.*

## PROBLEM AND SOLUTION OVERVIEW

You're waiting - for the train, for a friend, in line for the post office. You've checked your email. You've returned some texts. You've thumbed through Facebook. You've consumed every morsel of fresh data your phone is able to serve up. But you're still stuck, and now, you're bored.

Stop wasting time and start wondering. Wonderlust gathers cool information into bite-sized chunks to feed your intellectual curiosity. You can learn about samurai, about the Monty Hall Problem, about the six degrees of Kevin Bacon – all in 2 minutes. Kill time, not the cat.



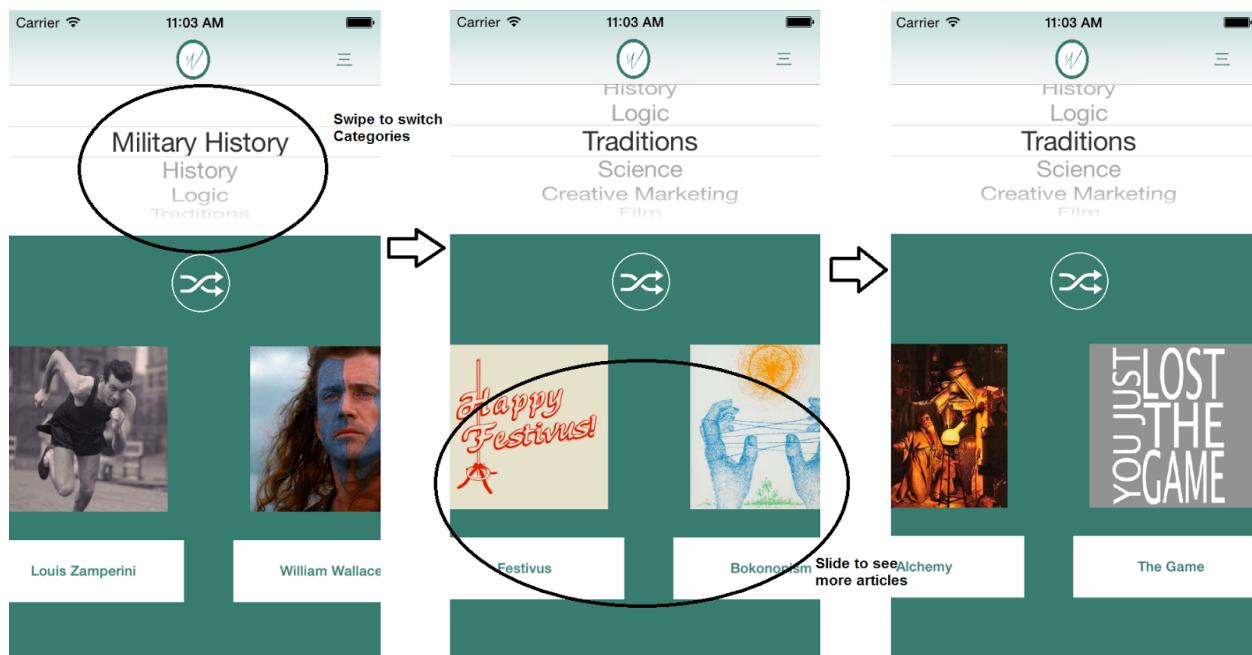
*Wonderlust Home Screen*

## TASKS

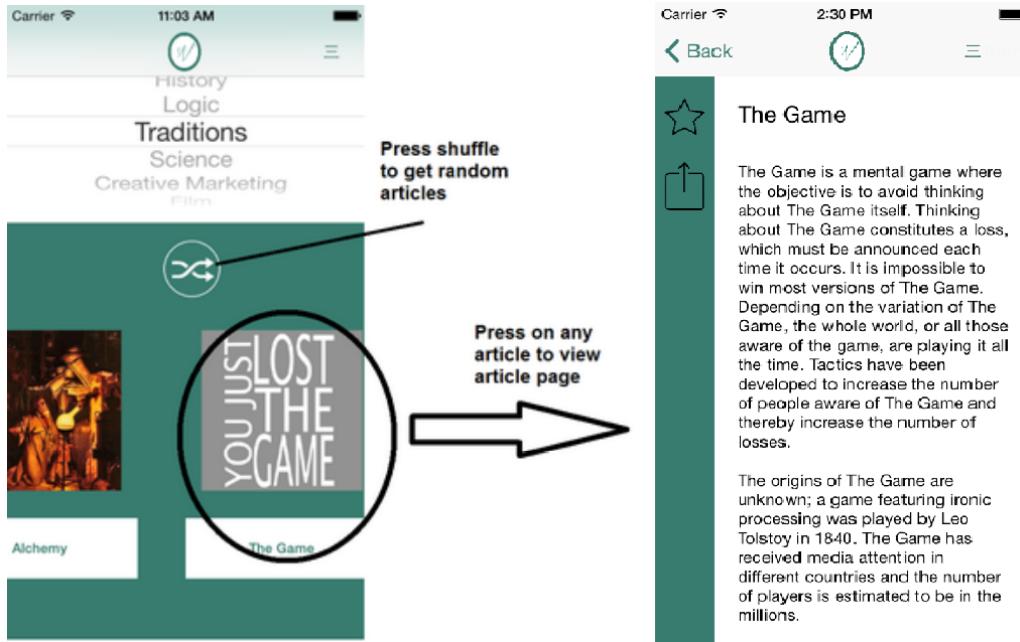
[Simple: EXPLORE]

In our most simple task, customers browse for stories (Wonderlust articles) that catch their eye. We chose this exploration-based task because it represents the primary goal of Wonderlust, which is to harness, enable, and reward intellectual curiosity across many fields. To maximize the customer's experience, Wonderlust filters information to match individual preferences for categories and presents information in a condensed, engaging manner.

This task is accomplished on the home screen, where the focus of the interface is on selecting an interesting category using the scroll mechanism. Once a category is selected, icons of stories relating to the category are populated along the bottom of the screen. Customers can then scroll through the images by swiping horizontally to find a story they want to read. There is also a shuffle button in the center of the wheel which, when selected, presents a random feed articles aggregated from across all categories. Please reference *Tasks Figure 1a* and *1b*.



*Tasks Figure 1a: Demonstration of Home Screen functionality*

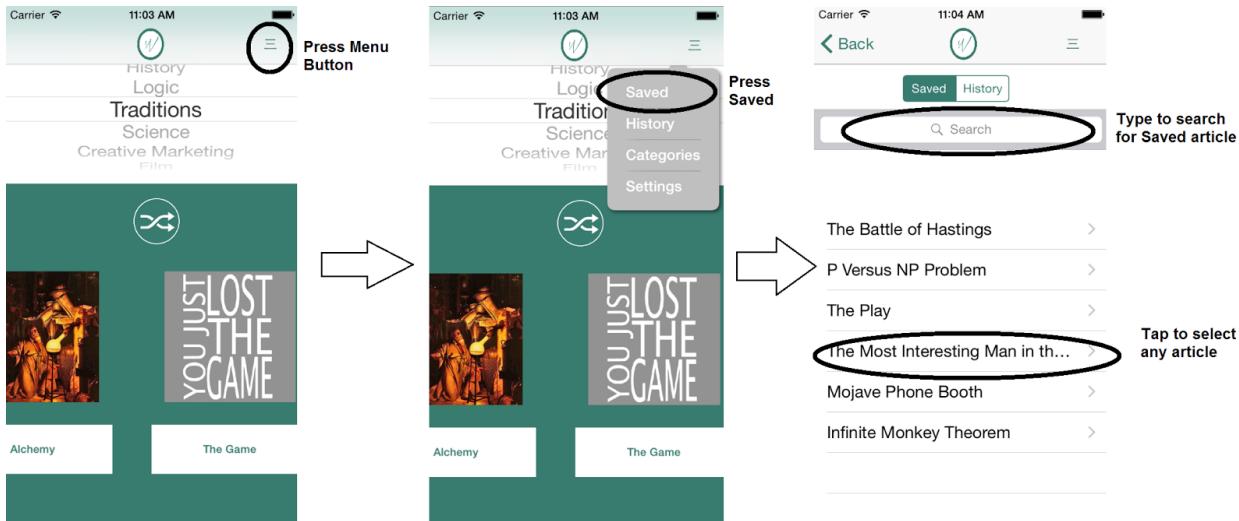


*Tasks Figure 1b: Demonstration of Home screen functionality*

[Moderate: COLLECT]

Our moderate task is to store and retrieve saved articles. We chose this task because we feel customers will be more likely to connect with and remember the information they encounter if they can take ownership of it by collecting the stories that interest them.

As customers view a story, they have the option to hit the star button to save the article. In order to access saved stories, customers hit the button on the right side of the top bar to see a drop-down menu. The menu includes a link to the “Saved” page that displays saved story and a “History” page that displays all previously viewed stories. A search bar facilitates navigation of these lists of stories. Please reference *Tasks Figure 2*.

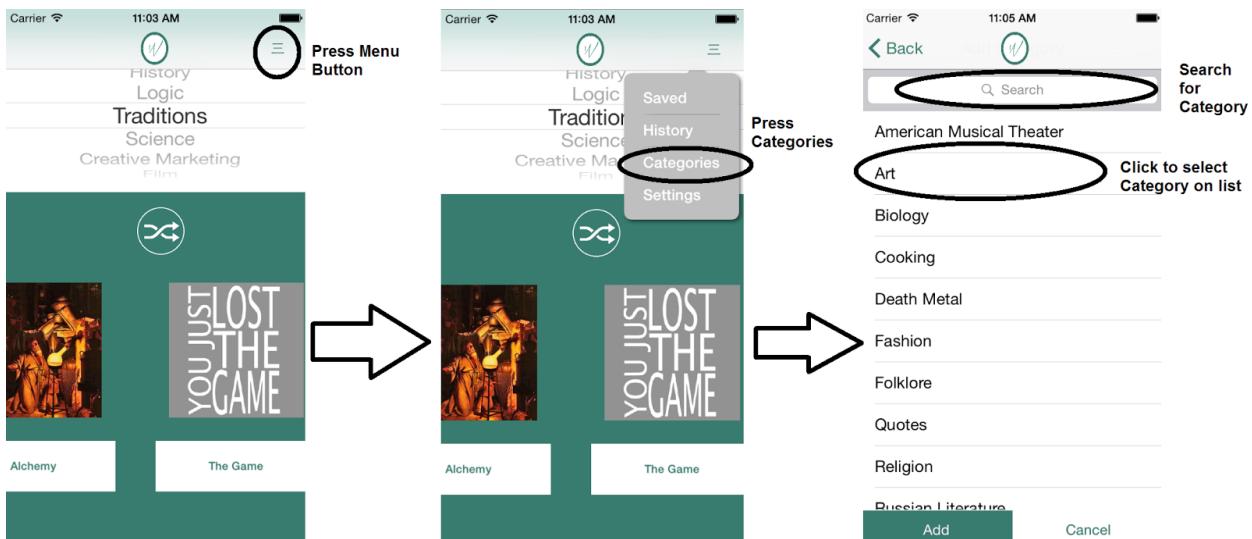


*Tasks Figure 2: Accessing and using Saved screen*

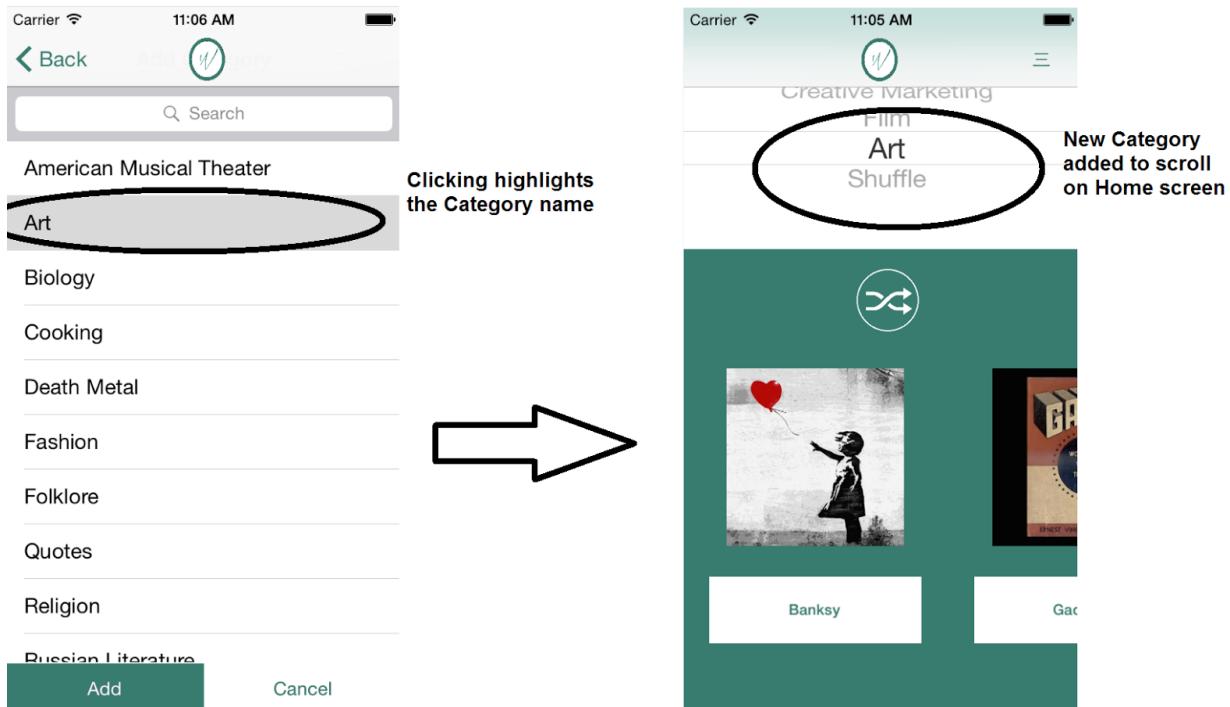
### [Complex: DIVE IN]

Our complex task is to discover stories from a category not already on the wheel. We chose this task to support customers who wish to increase their depth of knowledge in a specific field.

Customers click the top-right menu button to access the “Categories” page. Customers can add a new topic via a drop-down menu or search. Adding a new category brings them immediately to the home page with the new category on the wheel. Please reference *Tasks Figure 3a* and *3b*.



*Tasks Figure 3a: Adding new Categories*



*Tasks Figure 3b: New Category added to Home screen*

## MAJOR USABILITY PROBLEMS ADDRESSED

The following are violations to Nielsen's evaluation heuristics rated at a severity level of three, i.e. major violation. There were no violations with a severity rating above three.

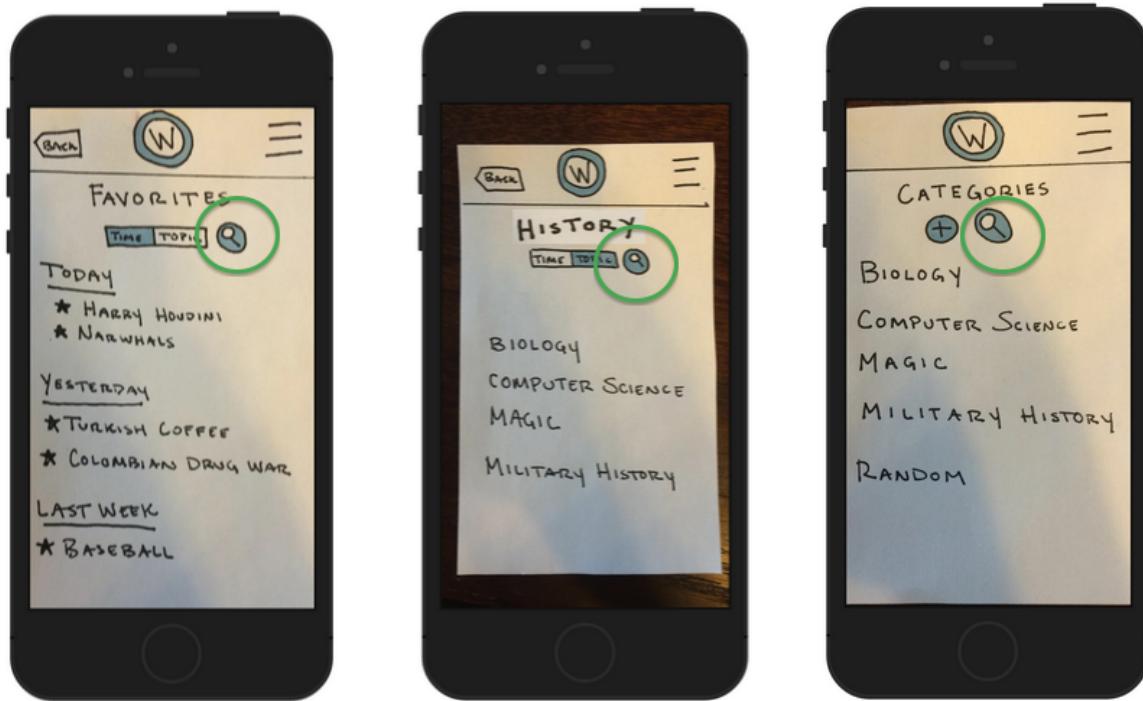
[Violation #1]

*Heuristic Violated:*

Consistency and Standards

*Violation Description:*

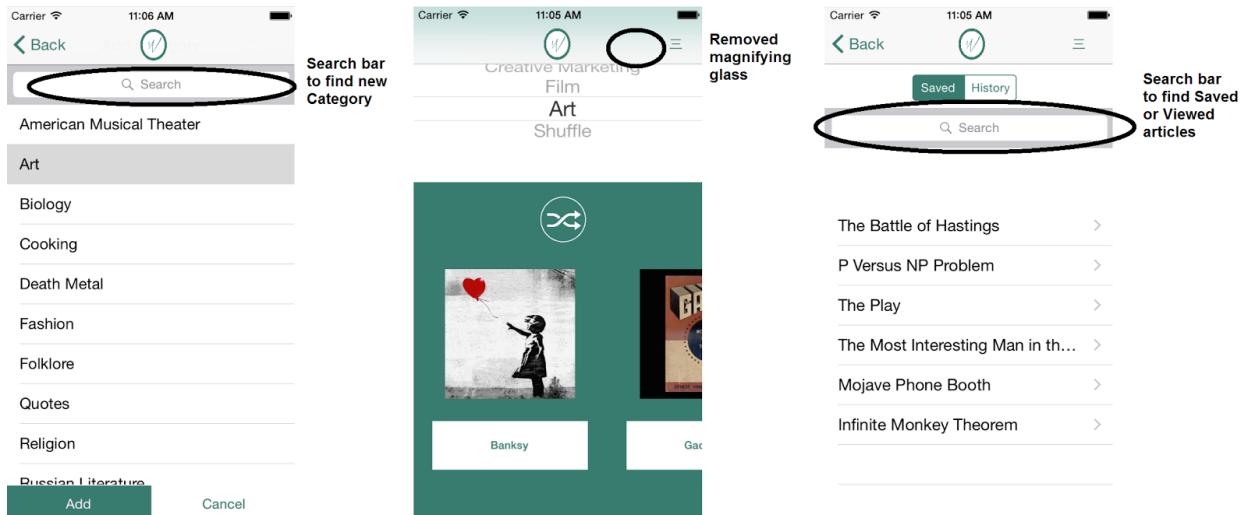
“Search has multiple connotations in this application, which means consistency is being violated. In some instances, like through the homepage, search allows you to search all the articles that are on the service, implying search on the application is a global search over all parts it. In other instances, such as on the category page, search only allows you to look up all categories available, which implies search on the application is a local search over the specific part of the application you are dealing with.”



*Usability Figure 1: MedFi Search icon within Favorites, History, and Categories*

### *The Fix:*

The content over which each search button was searching was ambiguous. Our solution is to replace the search button on the Saved and History screens with a search bar that has text indicating the search is for saved/viewed stories. The search button on the Categories screen is removed, and placed within the ‘Add New Category’ screen to demonstrate that this is a search for a category to be added. The magnifying glass on the top bar was removed in order to avoid ambiguity about what content is being searched. Please reference *Usability Figure 2*.



*Usability Figure 2: Changes on HiFi prototype related to search functionality*

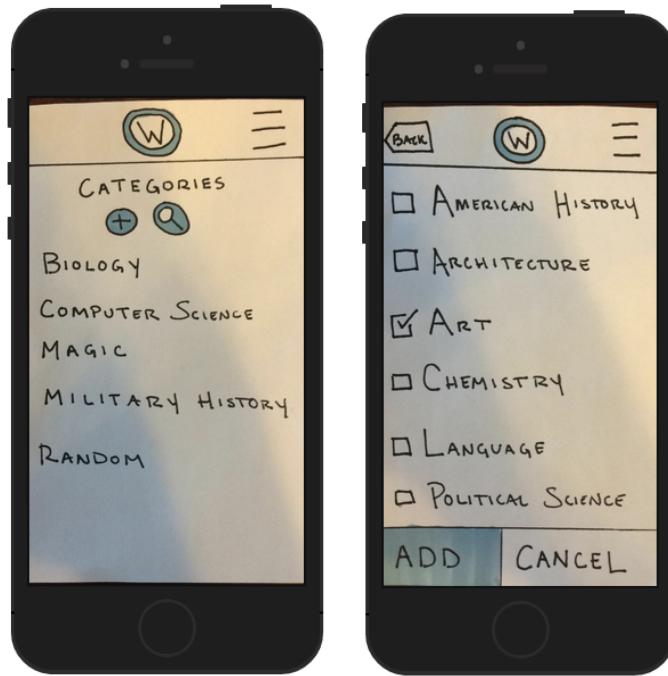
[Violation #2]

### *Heuristic Violated:*

User Control and Freedom

### *Violation Description:*

“There doesn’t seem to be any way to remove unwanted categories from the wheel, and no mention has been made of this.”



*Usability Figure 3: MedFi Category page and Add Category screen*

#### *The Fix:*

Customers should have a method to remove unwanted categories from the wheel to prevent cluttering. Although the implementation of this particular feature is beyond the scope of this prototype, our next prototype would mimic the native iOS functionality (Please reference *Usability Figure*) of swiping a row to pull up a delete button for that category.



*Usability Figure 4: Example of native iOS swipe-to-delete gesture (Not part of our prototype)*

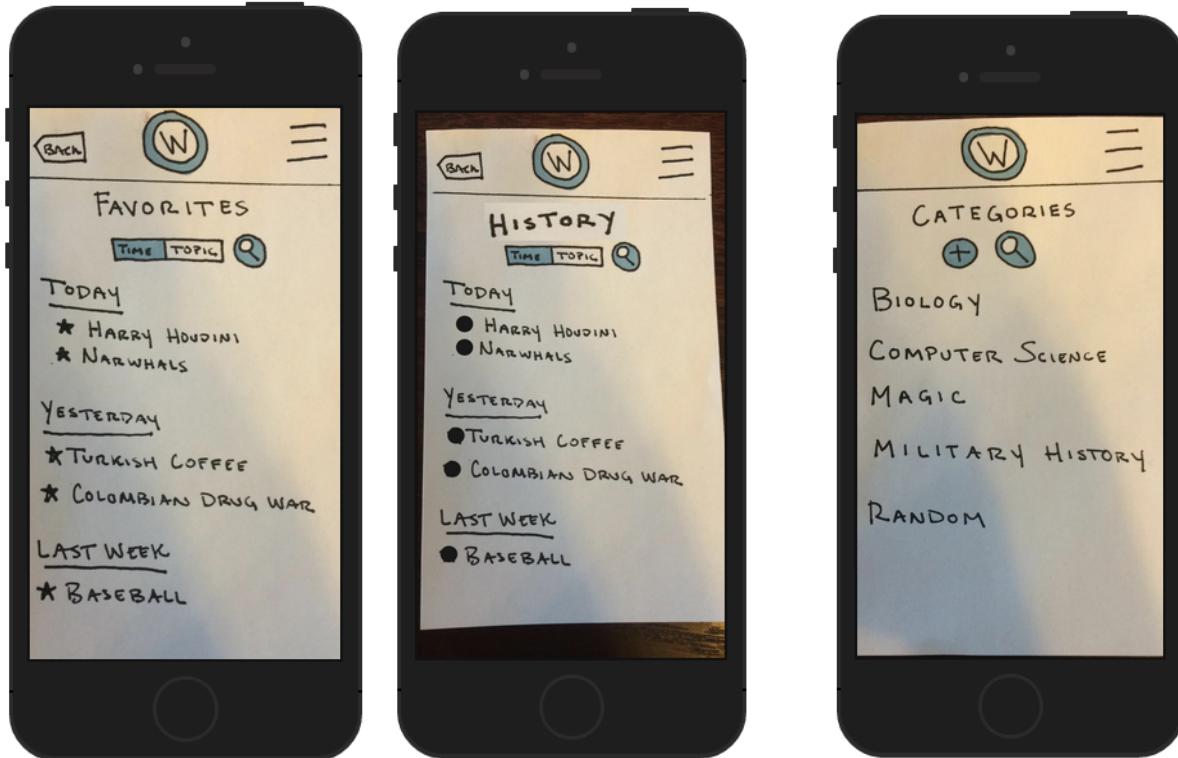
### [Violation #3]

*Heuristic Violated:*

Aesthetic and Minimalist Design

*Violation Description:*

This is the biggest problem in the app for me: there is a lot of duplication of functionality between different screens in this design. Categories, favorites, and history all look similar. The app as a whole feels bloated, with too many similar-looking screens to get at the same information. It seems like there should be a much smaller interface for reading snappy articles on the bus. The app currently has three different screens to choose between categories, history, and favorites, but perhaps one unified screen is enough to sift through all of them.

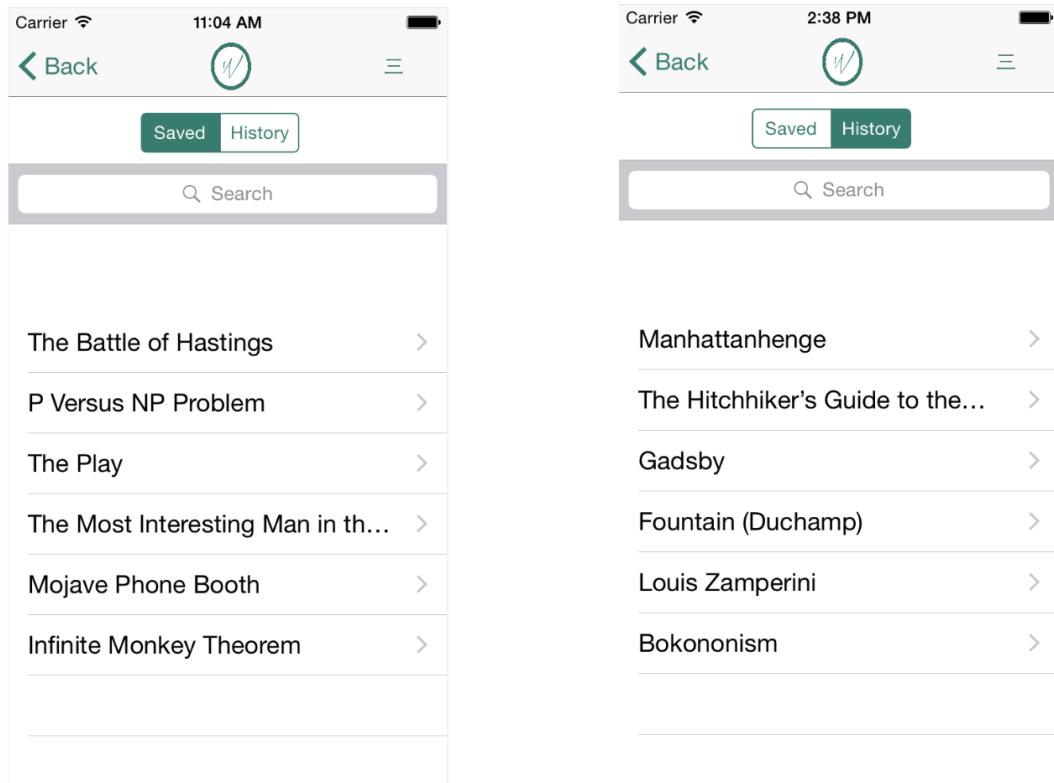


*Usability Figure 5: MedFi Favorites and History pages and Categories page*

*The Fix:*

It is important to Wonderlust that the customers feel the app is streamlined and easy to use - and excessive and rarely-used functionality will deter from that goal. While we disagree with the evaluators that the different screens on the MedFi prototype get to the same information, we agree that some of them can be condensed. The Saved and History screens are now combined,

and the sorting tab (to sort articles by time or topic) is replaced by a tab to display Saved and Viewed (History) articles (*Usability Figure 6*). The menu from the top bar will keep separate icons for the Saved and History pages to quick access to the same screen with the correct tab selected. The Category page will remain separate because it has a very different function: Saved and History allow the customer to return to previously viewed articles, while Categories allows them to add new categories to the home wheel. The Home link has been removed from the menu to remove duplicated functionality with the icon. We feel these changes address the bloated feeling of the app to the extent that does not reduce critically different functionality.



*Usability Figure 6: Saved and History screens*

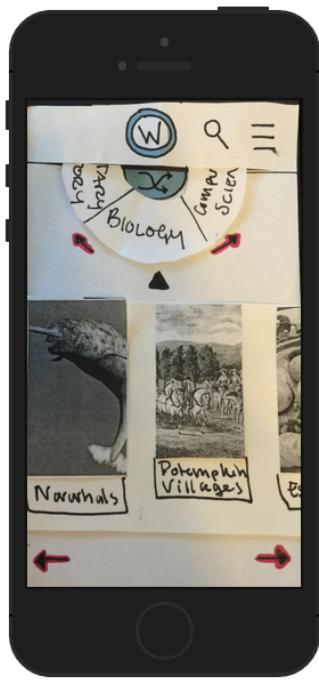
[Violation #4]

*Heuristic Violated:*

Flexibility & Efficiency of Use

*Violation Description:*

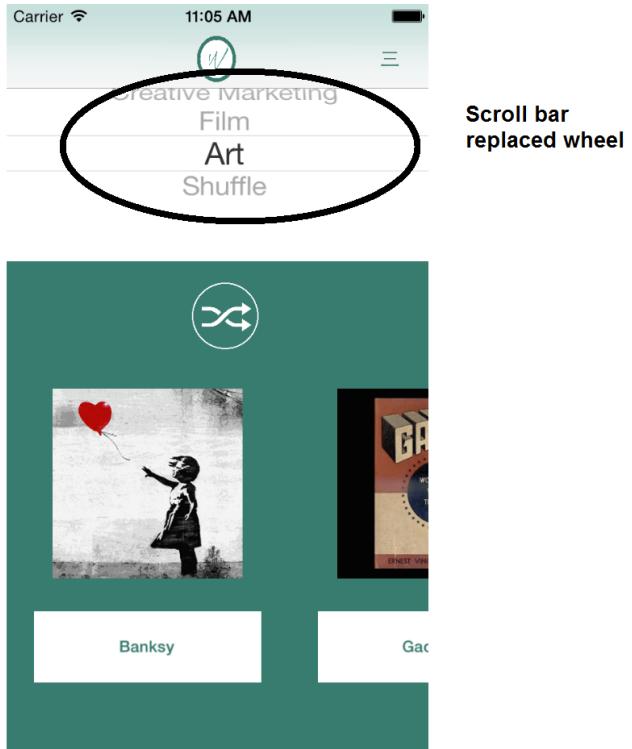
The wheel on the home page is an extremely inefficient way to sift through categories. If there are more than about 10 categories, the user is going to get a sore thumb, unless they get tired of spinning the wheel first.



*Usability Figure 7: MedFi Wheel comfortably fits only 4-5 categories*

*The Fix:*

It is important to display a sufficient number of categories at the same time on the wheel to prevent excessive scrolling. For the moment, we will address this by switching from a wheel interface to a scrolling bar as commonly used in the native iOS applications (see *Usability Figure 8*). Future user testing would include tests of the two different interfaces.



*Usability Figure 8: Home screen wheel replaced with scroll bar*

*[Violation #5]*

*Heuristic Violated:*

Aesthetic and Minimalist Design

*Violation Description:*

There is a separate search feature on the main page, to search for different articles, and then separate searches for saved stories and categories. One unified search function should be enough to go through everything, including categories, saved stories, and history. Duplication of functionality is confusing.

*The Fix:*

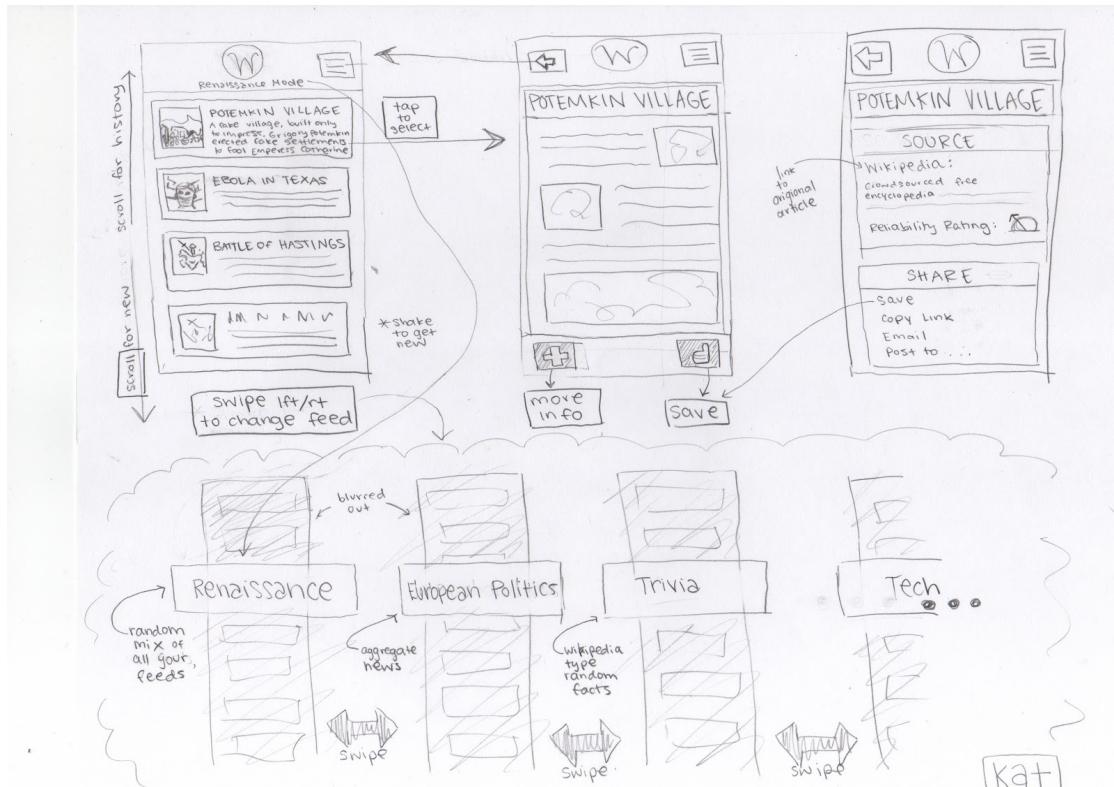
This is essentially violation #1. Duplication of violation is confusing.

## DESIGN EVOLUTION

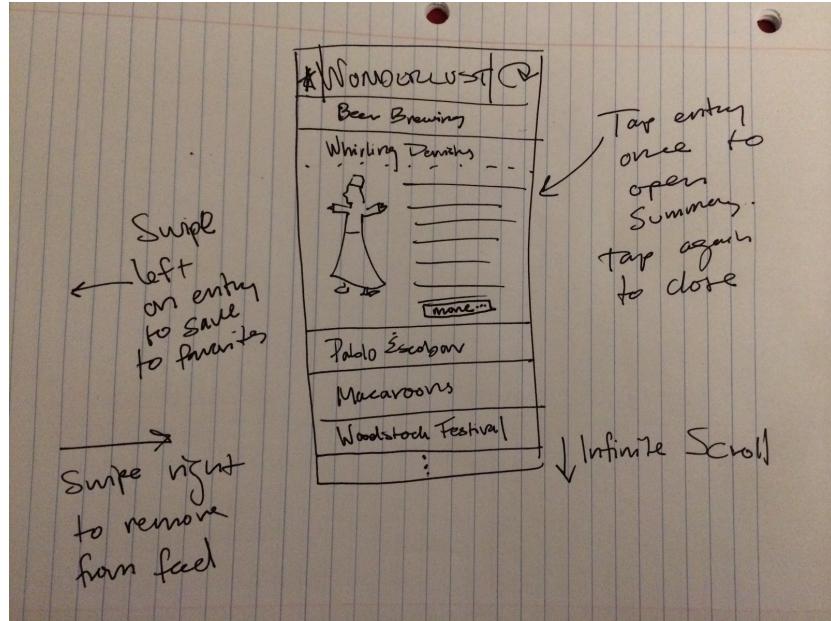
[Sketches]

Wonderlust's design evolution began with a **contextual inquiry**. This allowed us to gain a deeper understanding of how our target population interacts with unexpected, small blocks of time between activities. Our interviewees enjoy the freshness of continually updated information. They prefer shorter chunks of information as opposed to multi-page documents, but appreciate the option to pursue the subject further. We observed that most interviewees were frustrated by the lack of a simple way to save and compile information and instead email themselves links of articles they wish to remember. Interviewees value simplicity of interface design because of time constraints.

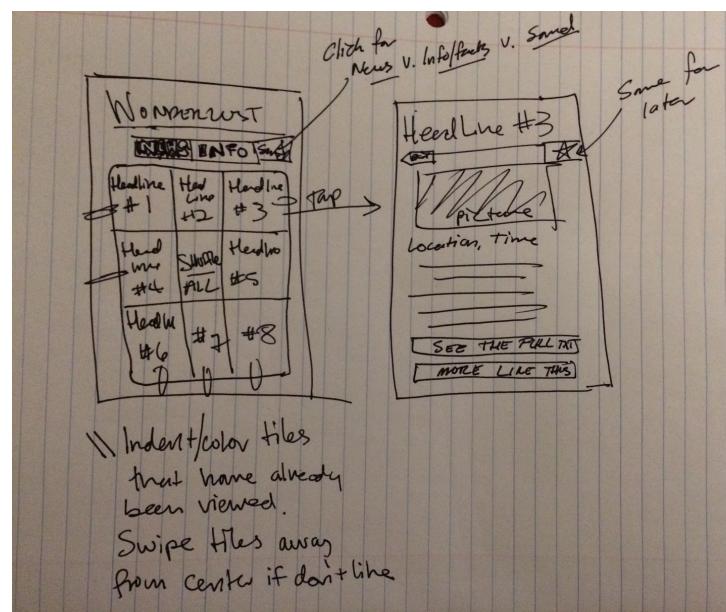
We used this information to conduct a **task analysis** and begin brainstorming application ideas, considering Android, iPhone, and Android wear platforms. We brainstormed a wide range of general designs that included interface schemas inspired by Facebook's infinite feed (see *Sketches Design 1*), Tindr's swipe gestures, and BBC News's horizontally sliding feeds in addition to other interface schemas like flickable tiles (see *Sketches Design 2*), collapsible bar entries (see *Sketches Design 3*), and android wear cards (see *Sketches Design 4*).



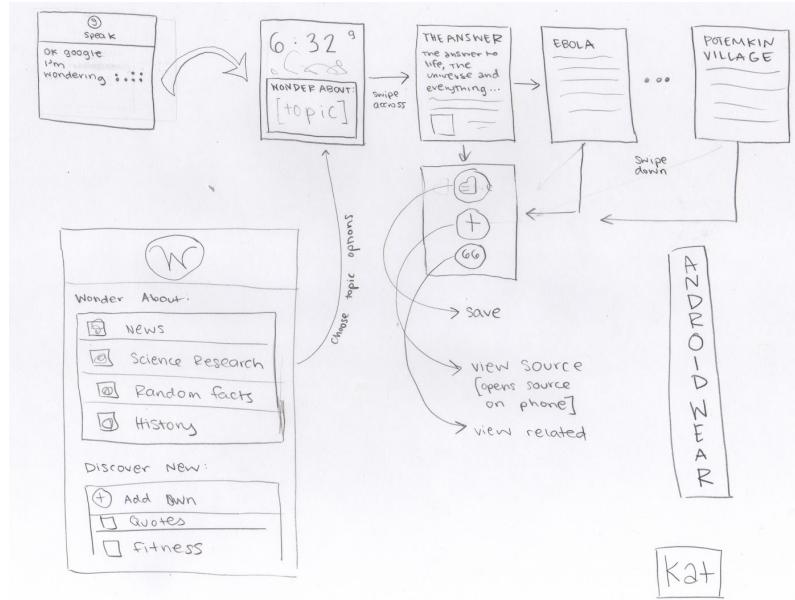
*Sketches Design 1: Facebook style home screen with category selection*



Sketches Design 2: Collapsible bar-entries home screen

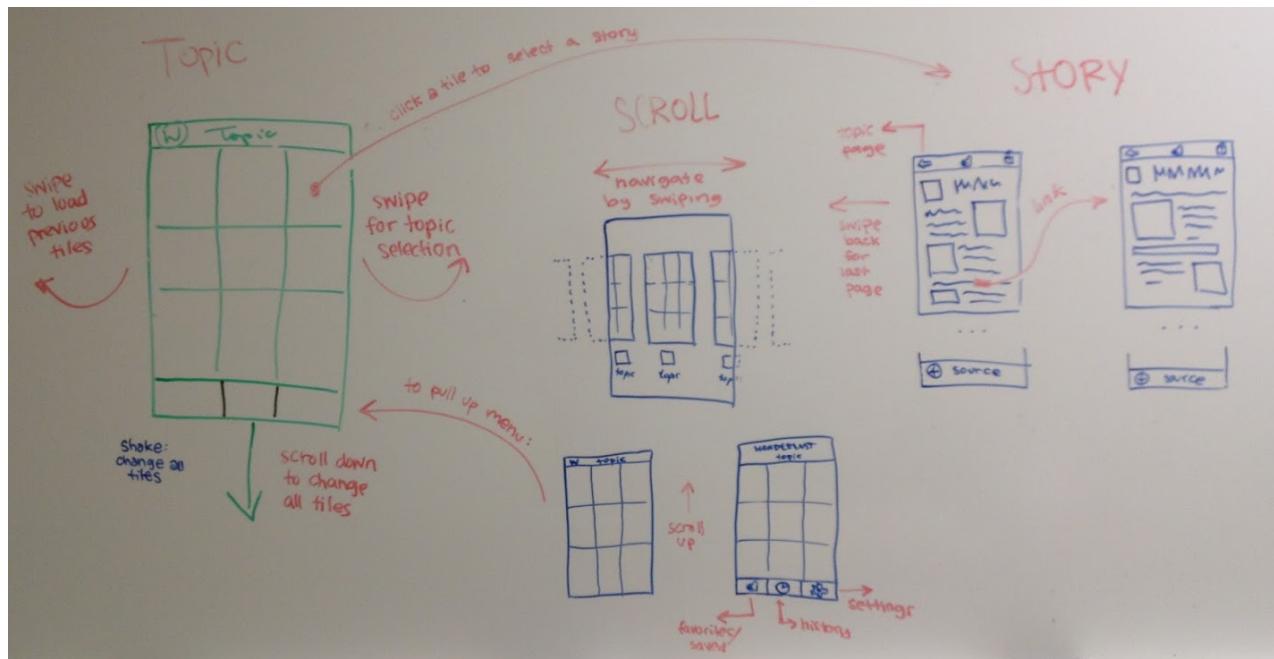


Sketches Design 3: Tiles-based home screen

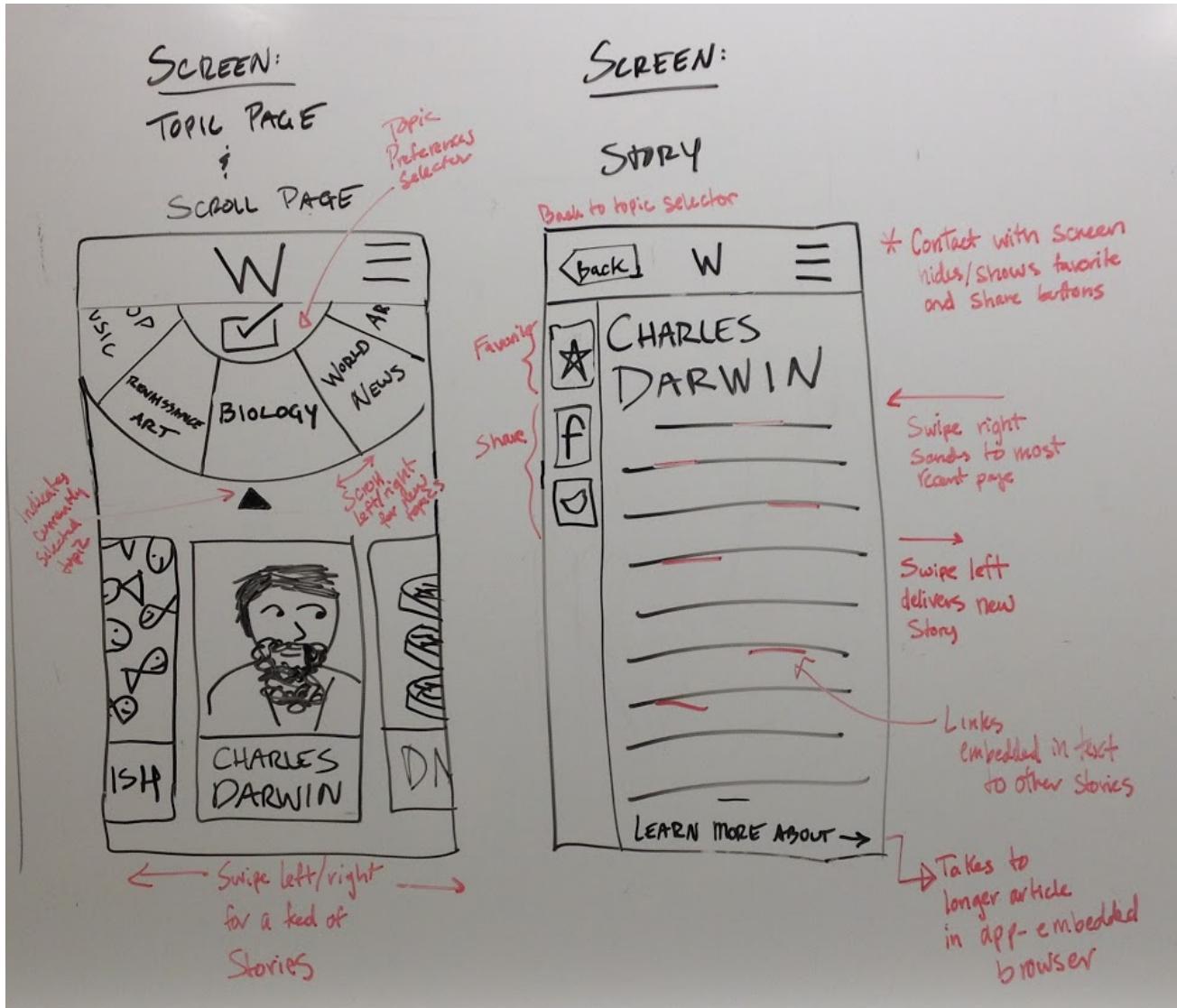


*Sketches Design 4: Android Wear cards*

We decided to focus on a tactile and interactive interface because the use of gestures eliminates the need for cluttered buttons and adds an element of fun. We zoned in on two designs - flickable Tiles (see *Sketches Design 5*) and a scrollable Wheel (see *Sketches Design 6*).

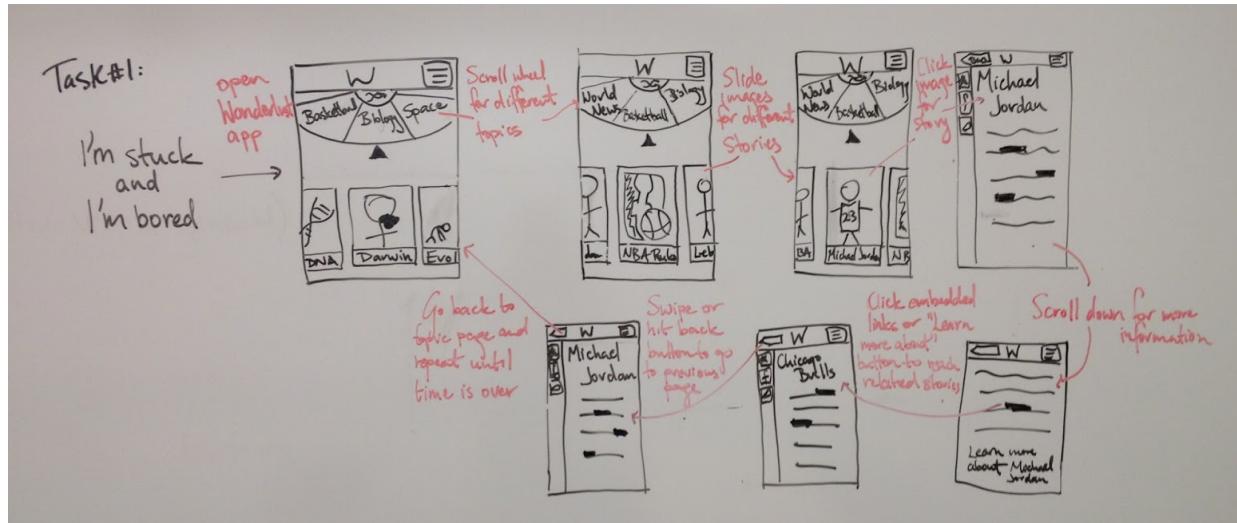


*Sketches Design 5: Improved Tile Interface*



*Sketches Design 6: Wheel Interface*

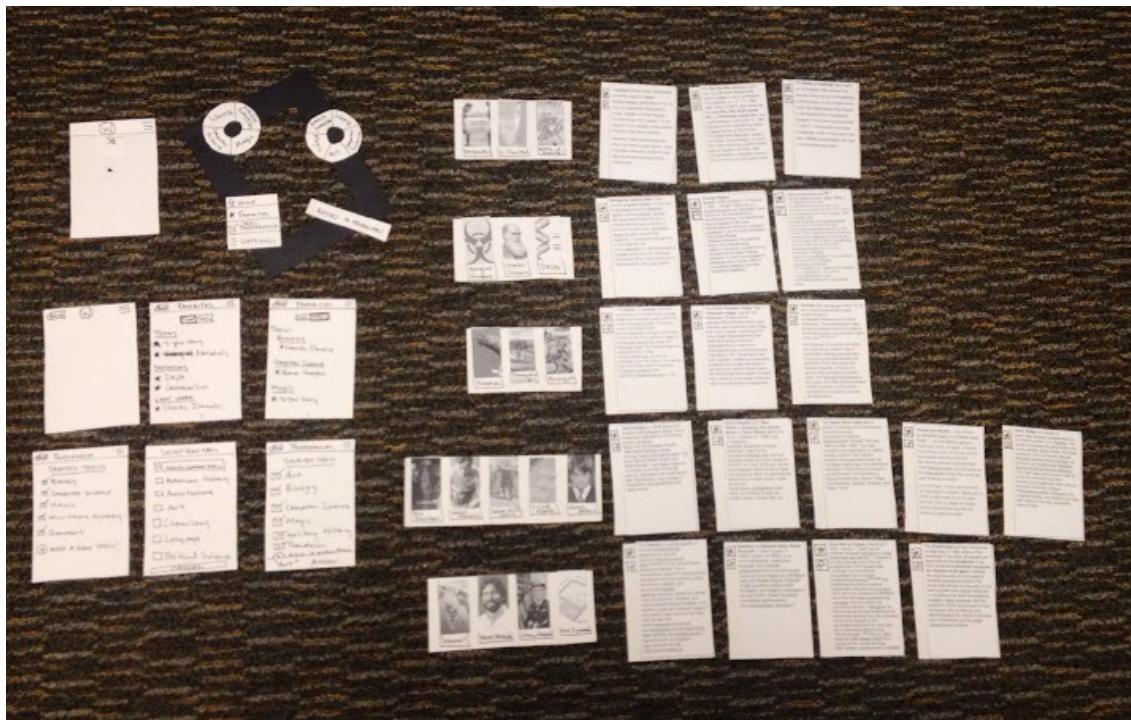
We chose the Wheel interface for continued design. It is distinguished by an interactive roulette-like wheel on the home screen that lets customers navigate quickly between their different themes. Our decision was based on the idea that the idiosyncratic design of the Wheel would help our product stand out in the relatively saturated market of information aggregation. It is a compromise between a single page design, which may help customers discover new interests by demanding they give each story a chance but may become tedious, and a tile or bar design, which lets the customer choose from many stories but may not be salient enough to focus attention on a single article. Furthermore, the Wheel design supports simplicity in interaction by minimizing button pressing and page navigation and instead maximizing the use of gestures. We storyboarded our each of our three tasks to create a higher resolution idea of the design (see *Sketches Design 7*).



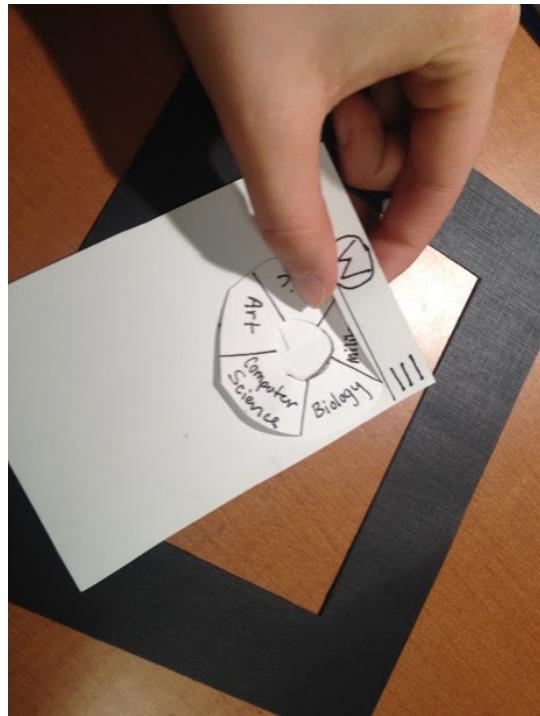
*Sketches Design 7: Explore Task Storyboard (A sample browsing session)*

[LoFi Prototype]

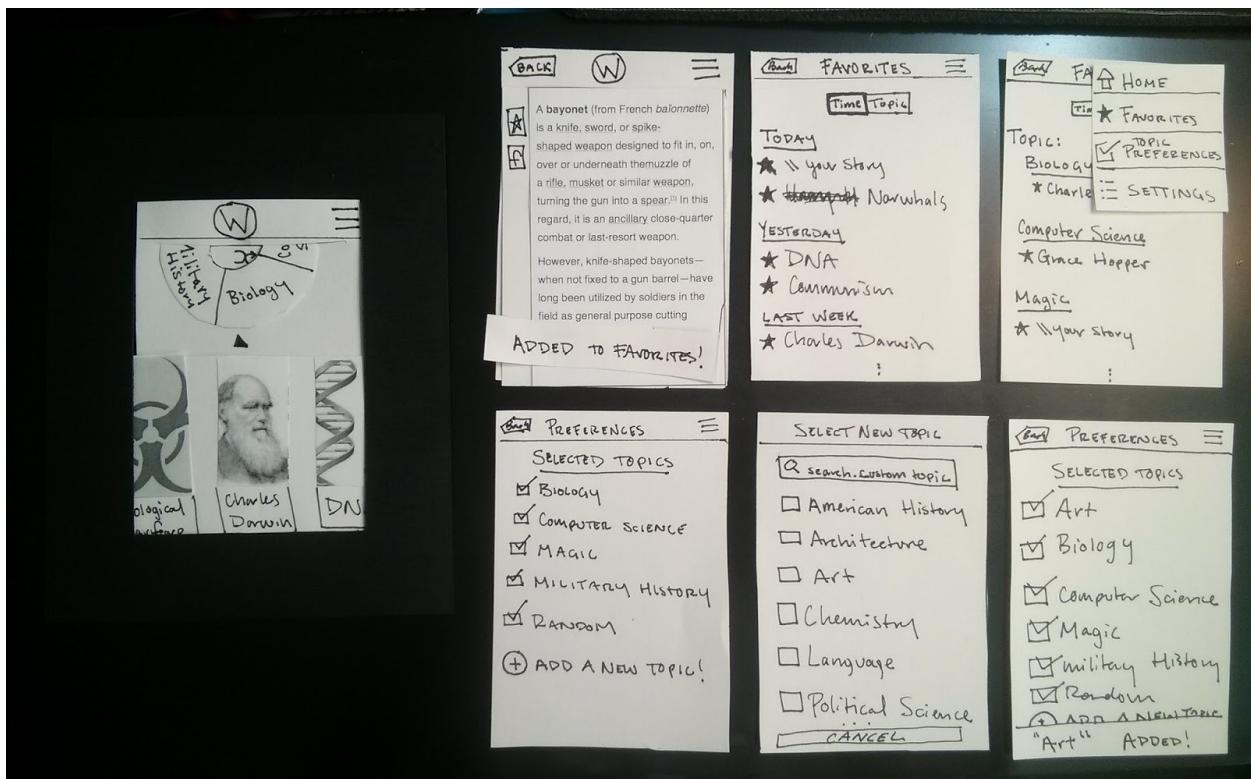
Moving forward, we created a paper prototype to simulate the visuals of a smartphone for a **pilot Usability Testing study**. The prototype consisted of many independent components (see *LoFi Design 1*) that could be physically manipulated and recombined by the experimenter (see *LoFi Design 2*) to represent each functioning screen (see *LoFi Design 3*).



*LoFi Design 1: Independent components of paper-based system*



*LoFi Design 2: Experimenter construction of interface screens from constituent parts*



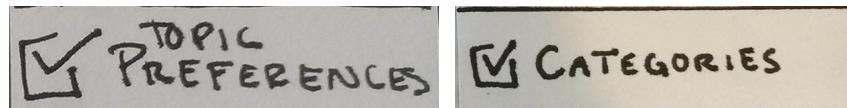
*LoFi Design 3: Representative functioning screens of paper-based system*

In general, participants in the Usability Study found the app to be ‘intuitive’ (all users explicitly used this word), and praised the ‘uncluttered’ and ‘cool’ design. However, they had difficulty locating the topic preferences page, were confused by the inactionable “W” logo, and worried about the number of categories accommodated by scroll wheel. They also wanted the app to support searching for content. The largest area for improvement our study revealed concerned the third task, discovering stories about a specific topic. Participants had difficulty locating the screen to modify the topics on the wheel, largely - they reported - due to their misunderstanding of the name “Topic preferences”.

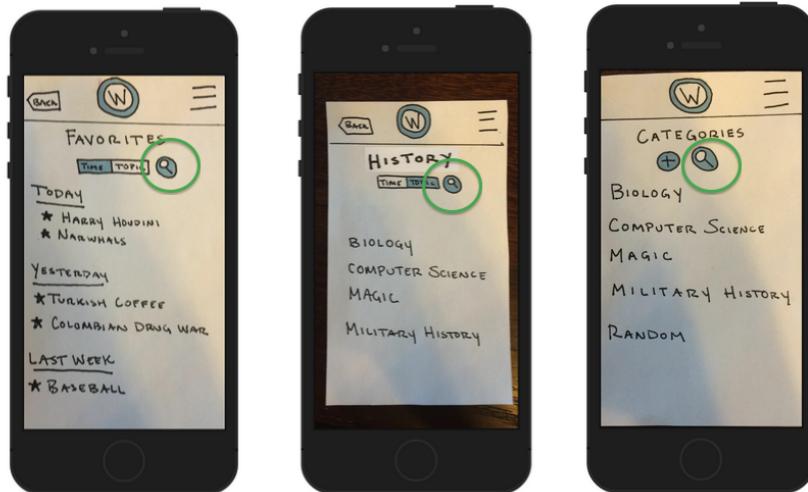
#### *[MedFi Prototype]*

We then used an online tool, Marvel, to represent our updated prototype. We created a new paper prototype that reflected the design changes from the Usability Study, photographed each screen, and connected different screens with hotspots to simulate gestures. The response time of this prototype was much faster than that of the paper prototype and there were no errors in page switching once all links were completed, which resulted in a better feel for the flow of the UI. However, we could only hardcode a limited number of control flows and had difficulty supporting advanced gestures like swiping with the Marvel tool.

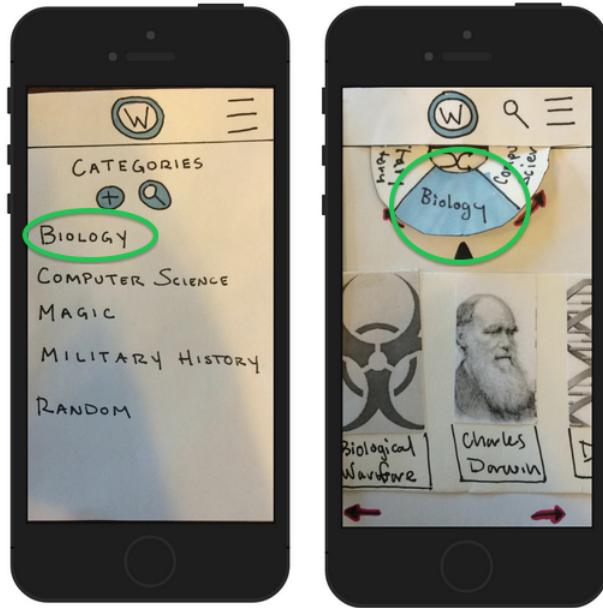
In response to the user study, we switched our terminology from “Topic” to “Category” (see *MedFi Design 1*), supported searching content (see *MedFi Design 2*), modified some of the links between screens (*Medfi Design 3*), and changed the interactivity of the shuffle button (see *MedFi Design 4*). In addition, we added the ability to discover stories by searching without permanently adding their category to the wheel, added a History page that passively records viewed stories, and created a more hierarchical interface for saved stories (see *MedFi Design 5*).



*MedFi Design 1: Previous menu button (left); Revised menu button (right)*



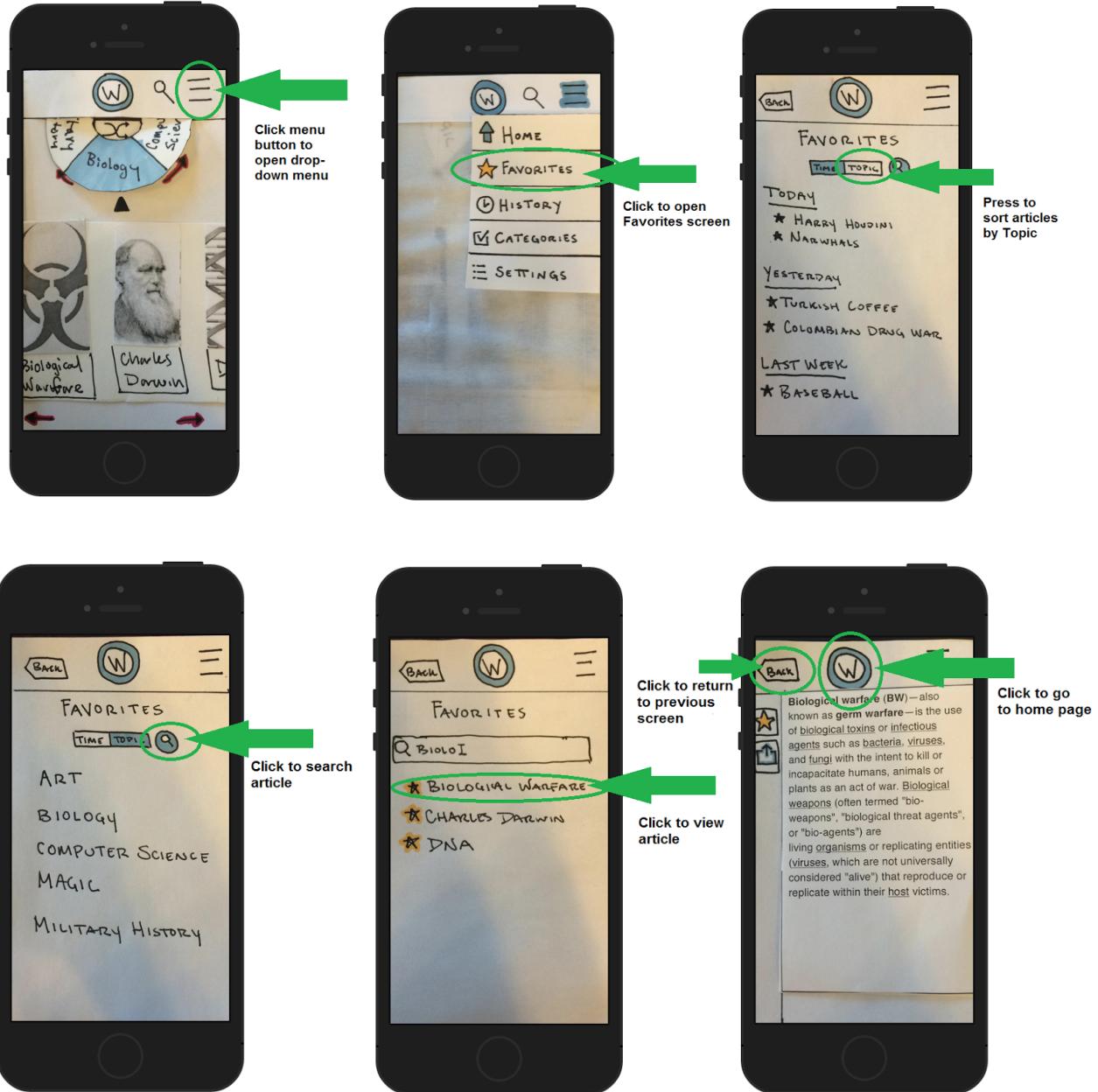
*MedFi Design 2: Search icon within Favorites, History, and Categories*



*MedFi Design 3: Tapping “Biology” from category page links directly to Biology story stream*



*MedFi Design 4: Selected Category (Shuffle (left), Military History (right)) highlighted on wheel*



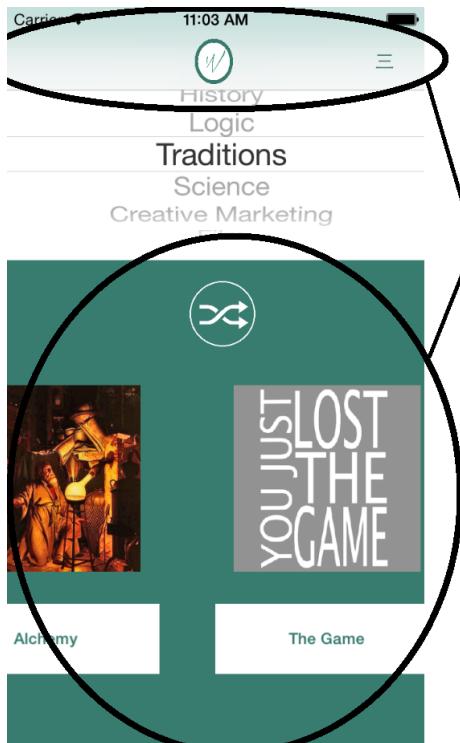
*MedFi Design 5: Storyboard for Collect task (Retrieve a saved story)*

Several CS147 students conducted a **Heuristic Evaluation** of our interface using this MedFi prototype. They spotted usability violations that the casual observer might miss.

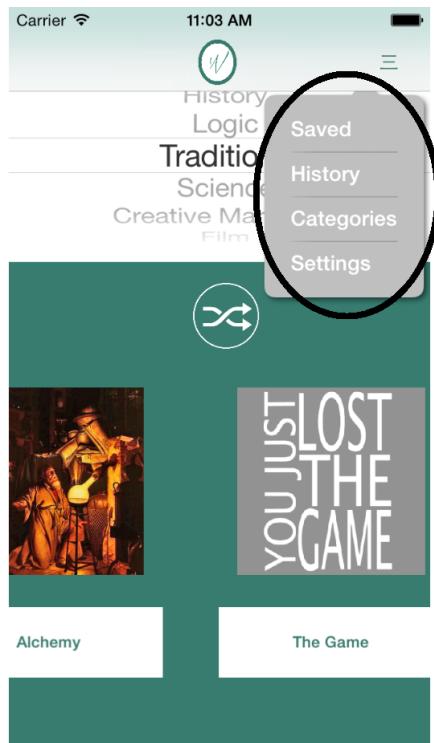
[\[HiFi Prototype\]](#)

The Heuristic Evaluation of the MedFi prototype resulted in several major changes to our UI, each of which is outlined in detail in the section titled “Major Usability Problems Addressed.” A simple color scheme was also chosen for the Home screen as well as the articles page to accent different elements of the UI (see *HiFi Design 1*). In addition, we standardized our terminology

for increased internal consistency, formally selecting the words “Story,” “Category,” and “Saved” (instead of ‘Favorites’) (see *HiFi Design 2*).



Color scheme added



Naming convention standardized

*HiFi Design 1: Color Scheme*

*HiFi Design 2: Naming Convention*

## HI-FI PROTOTYPE IMPLEMENTATION

[*Tools*]

The High Fidelity prototype was implemented as an iOS application using Xcode. We will outline both the advantages and the challenges we encountered during this experience below.

[Advantages]

Using iOS to construct a prototype is as close as one can get to an industry-grade product, and most of the good parts of our experience with the HiFi Prototype implementation stem from this fact. First and most important, we appreciated that we could leverage all of the libraries that come with iOS and Objective-C. As a result, we did not have to hand-roll many of the complicated graphical/interaction components, like the topic wheel or the scrolling of articles. Second, when done properly, this system can deploy an app to a real device and enable users to experience the genuine hardware component. Finally, because we coded in the same language and environment in which one would create a real product, we walk away from the project with a good sense of what to expect - in terms of challenges, limitations, and technical frameworks - as we continue to develop in iOS.

[Challenges]

Although it does enable the creation of a professional looking product, working with iOS is difficult for a number of reasons. First, we struggled with the steep learning curve associated with starting to create an app. A lot of time and stress that went to trying to get the app set up could have gone to further prototype development. Second, we were frustrated by the fact that we *had* to use many of the conventions of iOS. Using native libraries was a wonderful shortcut for built in features (like the topic picker on the home page shown in *Usability Figure 8*) but made it a challenge to go off book. For example, we could not enable the home button on the top bar to hyperlink to the home screen because the navigation bar is subject to the constraints of the iPhone development environment and Objective C. We found it harder to design an innovative interface when constrained by Apple's design ideologies and languages. Third, we wrestled with more errors and bugs when working with Objective C code than with the "point and shoot" Marvel prototype. Finally, only two team members had experience working with iOS, and neither felt they had full mastery of the skill. This prevented the technical side of development of the HiFi prototype from being a truly group effort and, when combined with the time-sensitive environment, limited the polish of the final prototype.

[Prototype and ReadMe]

Link to Prototype: <http://install.diawi.com/sSr5YS>

Link to ReadMe:

[http://stanford.edu/class/cs147/projects/information/wonderlust/website/documents/hiFi\\_instructions.pdf](http://stanford.edu/class/cs147/projects/information/wonderlust/website/documents/hiFi_instructions.pdf)

### *[Hard-coded Data]*

All content on this prototype was hard-coded, just like previous prototypes. This includes the Categories of articles, the article titles, article content, and the photo associated with each article. The articles were all obtained from Wikipedia. Additionally, the articles chosen for ‘Saved’ and ‘History’ were hand picked.

### *[Wizard of Oz]*

The “Add Category” function is a Wizard of Oz technique. Users can click into the “Add Category” button and view a list of candidate Categories to add to their wheel. However, clicking the ‘Add’ button will always result in ‘Art’ being added.

### *[Future Improvements]*

In the future, Wonderlust would move past hard coded stories to scrape interesting content from Wikipedia as well as other sources. This would allow customers to access fresh content each time they use the app and a wide variety of categories. We could incorporate a hyperlink system to enable customers to follow a tangent by jumping directly between articles that reference each other. In addition, Wonderlust could use the Saved and History pages to learn the customer’s taste in stories and preferentially display new content to fits these tastes. We could implement a Queue for customers to store a reading list of stories they do not currently have the time to view. Another potential feature is incorporating mini-games to provide a different avenue to engage users with the content. One way of implementing this is to create quizzes from different articles or categories (e.g. ask questions about a specific article that the user has not read) in order to spark an interest in the topic or reaffirm existing knowledge. We could also keep track of many articles the customer has viewed to provide motivation and rewards for reading more stories.

Besides design improvements, there are several improvements we could make on the implementation. The first feature we would tackle is completing the implementation of the Wheel. One of the reasons we avoided this feature was difficulty in creating the wheel object with an appropriate display size. If more time were available, we would definitely attempt this feature as we feel it is one of the more unique elements of our design. Other implementation possibilities are a tighter display of articles on the Home screen, alignment between the article image and article title, and the sharing functionality.