Redesign of Weatherbug

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Executive Summary

Application Domain

Weather conditions are an important part of most people's daily lives. From choosing what clothes to wear to deciding whether to open the windows or leave them shut and anything in between, whether it is raining or sunny, hot or cold weather impacts the lifestyle choices of nearly everyone. People access weather information in a variety of ways - TV news, internet news and weather sites, and mobile phone weather applications. For this project, we were interested in how, when, and from where participants used the WeatherBug application to access weather information, as well as what decisions they made based on the data received from the application.

Data Collection Methods

For this study, we asked four (4) people to participate in a diary study. Two (2) of our users were females and two (2) were male ages 25 - 61. All are regular smartphone application users - three (3) on the Android platform and one (1) on the iPhone, and each participant was asked to download the WeatherBug application to his or her smartphone and become familiar with it prior to the first day of the diary study.

For the purpose of the study, each user was given a unique diary page in Google Drive for each of the two weeks in which to keep his/her daily entries. During the first week, participants were reminded daily to access the WeatherBug application from their phones at least once time per day and then record their experiences in their Word-style diary. They were to answer the time and location of use and then relate their experiences based on a series of prompts located at the beginning of the diary. Unfortunately, we did not receive as much data as we had hoped. So we made some adjustments.

During the second week, we changed the style of the diary document to a spreadsheet with the dates down the left side of the document and the prompts across the top. Once again, each day users were reminded to use WeatherBug, but this time we were more insistent on use and filling out the diaries. All participants filled in their diaries and answered the prompts, which yielded far greater results and more useful data.

Data Analysis and Design Ideas

With the results of our diary study, we created an affinity diagram, and from the affinity diagram, we created two models - a combination physical and artifact model and a cultural model. These models provide a visual representation of how participants used the application, what their choices were, and how the information affected their choices. This gave us insight for requirements - user, design, and usability - and the changes we would make in the redesign. With

the models and requirements, we created a low fidelity paper prototype of the new design, which eliminated some redundancies and proposed a new business model. From the paper prototype, we created a hi-fidelity prototype.

Idea Evaluation and Prototyping

Our four (4) participants were individually shown the hi-fidelity prototype and were each walked through how it works. Then each was allowed to *play* with the prototype, making his/her own choices as to where to look. Afterward, each participant was asked to answer a series of questions based on the prototype.
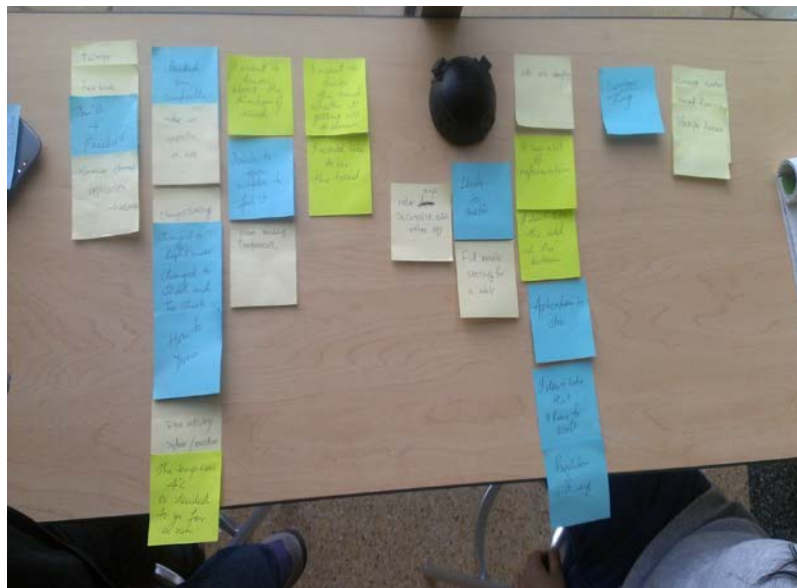
Field Data Collected

Figure 1: The Affinity Diagram

The data collected in the first and second week were analyzed with the help of an affinity diagram. The data was categorized into:

- Applications that were used after the application

- Features currently being used

- Features that are currently not supported

- Features that are found annoying

- Decisions based on the applications

- Issues with the interface/applications

The users currently did not use many features of the application other than current weather, extended forecast, and lifestyle forecast. The decisions they made after using the application were influenced by the application. The application helped them in making fashion decisions, sports decisions, or simply carrying appropriate weather gear. Among all the users fashion was found to have the largest influence, like carrying your shades, sweatshirts, or rain shoes. Instead of absolute values of forecast, users want to know more about the variation as well. Variations in temperature, precipitation and wind affect their decision making.

WeatherBug was found to have issues related to the interface. The application was found to have information overload with specific details. The advertisements were found annoying. The primary function of the application was to provide the weather information however due to over information of a particular weather on a single day; to find out weather data of other days, it was needed to scroll the interface. The feature of Radar was found to be inconsistent and found to have different coverage. Hence, most of the users were unhappy that the basic function of the application comes with many different data that is not necessary for everyday usage. They wished if they could control the interface a bit more displaying what was intended and needed.

Limitations
There are limitations to this study. First, we only used four (4) participants, which is not representative of any population. Second, during the first week, we received very little feedback. One user started her diary, but did not fill in more than a day. A second user filled in very minimal information. A third user filled in the most information, giving great detail of choices made and how the application was used, while the final user didn't fill in the diary at all. Hence the study was further modifies by making it more intuitive. The questions were made qualitative and not too direct. And the users were given columns to fill up and requested to fill up as much as possible for research. There was a lot of bugging as there was an email with a request for entry every day. Hence the data might be oriented; however the designers looked at making the data relevant form their own experience and on field observation and interviews.

Work/Activity Models

Of the five models available for the design process. Artifact, Physical and Cultural model were chosen to have a proximity to the redesign of the application and hence used.

Artifact and Physical Model

This model shows how users utilize WeatherBug and other artifacts in their daily lives. Artifacts include weather gears, skin lotion or windows in building. Users might change their plans according to forecasts in WeatherBug. For example, they would change outdoor activities to indoor workout because it is going to rain. Another example is the environment context. If it is going to rain, users might close windows. All in all, users' behaviors would change by variation of weather. WeatherBug can assist them to make decisions.

The physical and artifact model shows how decisions were made and in what context. It is cyclical in that participants made their decisions at specific times and in specific places. When they are at home, they used the information to decide what to wear for the day, whether to open the windows, skin care, if outdoor activities were a good idea, etc. These types of decisions were made repeatedly by our participants throughout their daily use of the application in varying contexts. The model synthesizes this data from all contexts into a single visual model.
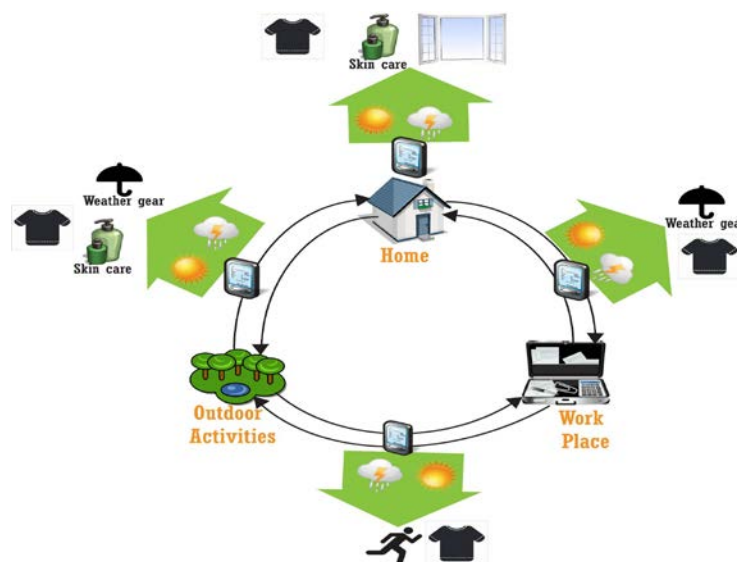

Figure 2: *The Artifact and Physical Model shows decisions made in different context. Artifacts that users use among all the contexts.*

Cultural Model
The cultural model shows how our participants collectively used the application - the features accessed and their next steps. Decisions were made based on data. The data used most in decision making include wind speeds, temperature, and trends (extended forecast). The decisions made include personal decisions and clothing choices. Some users took suggestions from the application, and some found the application as entertaining. The model suggested what the expectations of the user were and how people were adjusting and accommodating WeatherBug in their daily life.
This model helped us more in taking design decisions further in the study. Whenever there was a conflict of idea the designers used the cultural model for taking decisions.
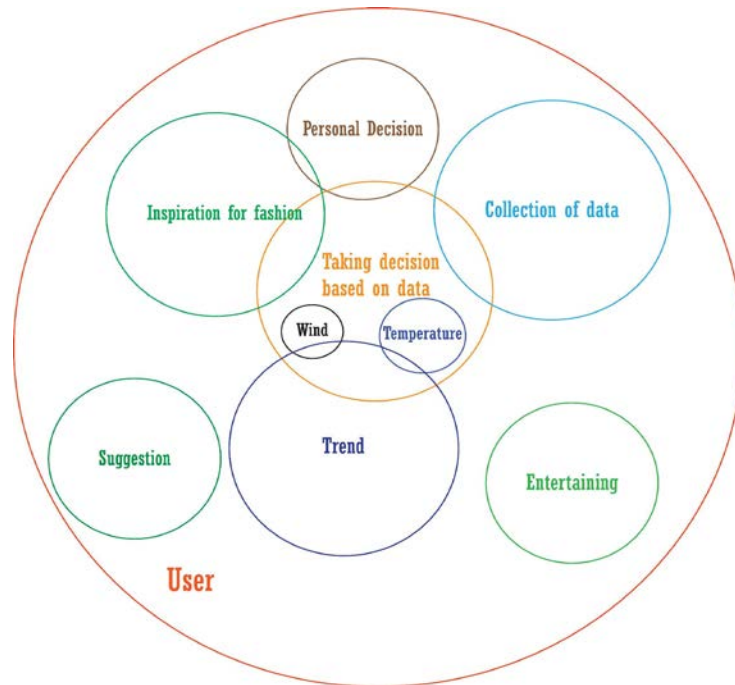
Figure 3: *The Cultural Model shows how participants used the application, which features were accessed, and how the information was used.*

Requirements

User Segments

Various user segments/ profiles were identified for the applications. Some of the most active user segments identified was:

- Tourists - They visit new places, they need to
- Office Workers - Users may decide their outfit according to weather forecast. When it is going to raining, they would decide to bring a gear with them such as raincoat or umbrella.
- Fashionistas - They looking for different looks and trends based seasons.
- Students - Their planning on outdoor sports would be affected by weather. If the forecast show that it will rain in the afternoon, they might cancel their outdoor jogging.
- Sportsmen - People interested in outdoor sports would rely on good weather conditions. Their plans for going to outdoor activities are affected by the weather profoundly.

From here Fashionistas were chosen as our key user segments related to our field study where we found most users taking basic fashion decisions.
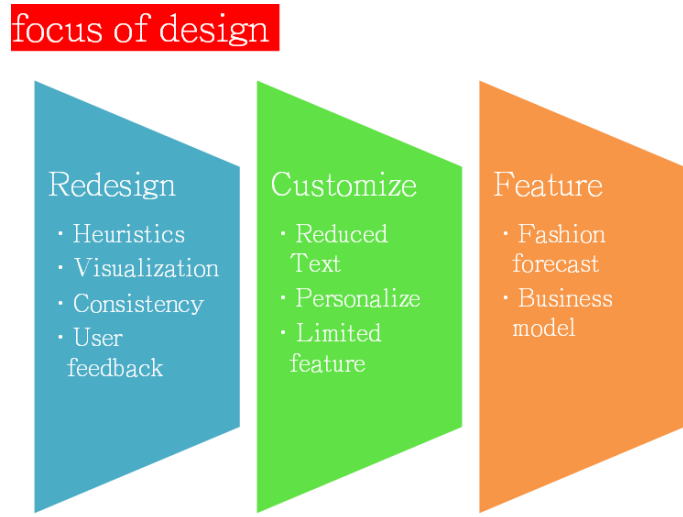
High Level Design Goal

The data revealed how fashion decision is being used by different people in different ways with the help of fashion goals.

The high level goals of this project are as follows:
- To help satisfy the primary objective of the user.
- To easily retrieve and use information from the application.
- To make a suggestive application
- To give user better initiatives for exploring the application
- To give WeatherBug a better marketing approach by targeting the needs of the user.
- To induce fashion as a key element of the application.
- To target fashionistas.

However the focus of the design as represented:

focus of design

Redesign	Customize	Feature
· Heuristics · Visualization · Consistency · User feedback	· Reduced Text · Personalize · Limited feature	· Fashion forecast · Business model

Design Requirements

The requirement analysis from the models revealed:
- Redesigning of the web application to make it more user friendly with the help of usability issues discovered by Heuristic Analysis.
- Some of the information provided by the application was found to be too technical for the user segments to understand. It is proposed better information visualization for the application
- Some of the information seems irrelevant for the user however some of the information is found to be apt for some segment. Customization of the information is proposed to meet user needs.
- The application has many facets of lifestyle forecasts. However the information is not visualized well and faces readability issues
- The lifestyle forecasts are informative and hence less used. It is proposed to make the application more suggestive.
- With inference from the data analysis, showed a heavy influence over get up of the users. Hence it is suggested to have a deeper fashion forecast.

Usability Requirements

Some of the usability requirements that were identified for the interface with the help of heuristic evaluation and user feedback from the diary study conducted were found to be:

- option for location in home screen
- no heat index
- easy to transfer metric system
- keep the date and day together
- We the remove ad from the bottom as it was conflicting the interaction space of the users.

Effectiveness

- The application needs to be effective to display the basic requirement of weather display.

Efficiency

- The application needs to provide the information the user seeks in a timely manner.
- User should be able to customize the application in such a way that the information s/he wants/needs regularly is available on loading.

Utility

- The weather data provided should be applicable to real life and be able to suggest decisions based on it. The application should have extended utility to have a better return on investment.

Learnability

- The application should be easy to learn so that the user does not become frustrated.
- The application should be consistent with the design so that the users can easily learn what they are doing.
- Over information has been hidden and the users are given an option to hide and unhide the information they need to emphasize the important information for daily use.

Memorability

- The functions of the application should be easy to remember so the user does not have to relearn or put much thought into how to use the application.
- Throughout the application we have tried to provide icons and small arrows that tend to indicate what the users need to choose from.

Conceptual Design (IDM)

Users (Fashionistas) of WeatherBug use weather bug to check basically the temperature and wind. Other features don't matter as they don't influence them. The immediate decision on fashion can be based on the application. However keeping in nature of the competitive weather application. The application would also provide other weather details like gusts, humidity and others. Hence the customize feature has been heavily stressed in the application.
The application forecasts fashion forecasts. As selected in the settings panel by men, women, girl and boys. The application should display basic fashion suggestions like clothing and accessories along with weather.

The features of Premium members gives the user chances of exploring fashion more and even buy with the help of the application.

Business Model of the New WeatherBug

One of the big changes that we did to WeatherBug g was to remove the advertisement wand the group members came up with a proposal to support its business model.

Vision

Shopping agencies and magazines often showcase fashion pages with outfits based on season. They use their individual pages and sources to showcase and create a strategy for selling their outfits. Outfits are often and heavily influenced by the weather. We provide a space through WeatherBug where both the user and commercial stakeholders can interact and fulfill their interests through the application. The fashion trends are being displayed in the application and WeatherBug users can set themselves according to the fashion preferences by store or magazine

Feature in WeatherBug

The application uniquely forecasts the weather data for the user and the stakeholders. They showcase their fashion items according to the weather.

The application can showcase local fashion details by simply changing the location. The user can change the application according to the user preferences of shop like Target, Macy's, Kohl's or according to the magazines like Cosmopolitan, Vogue, Fashion.

In the Settings panel the user has the option of changing the fashion status according to the user like male, female, girl or boy.

Marketing Strategy

This feature in the application can help the stakeholders both of the application and the associated stakeholders like the shops and magazines that trend fashion. As WeatherBug is a basic weather application, to have a competitive market the application the basic feature that is the display of weather and the corresponding forecasts should be free to all. However as for the stakeholders, the concept of Premium users is being introduced. The Premium account holders can see the fashion forecasts and do the shopping via application according to the latest fashion trends that are being available to the user.

Moreover for an open marketing option for the user the application can help can also act as an advertisement trend for the latest trends in fashion.
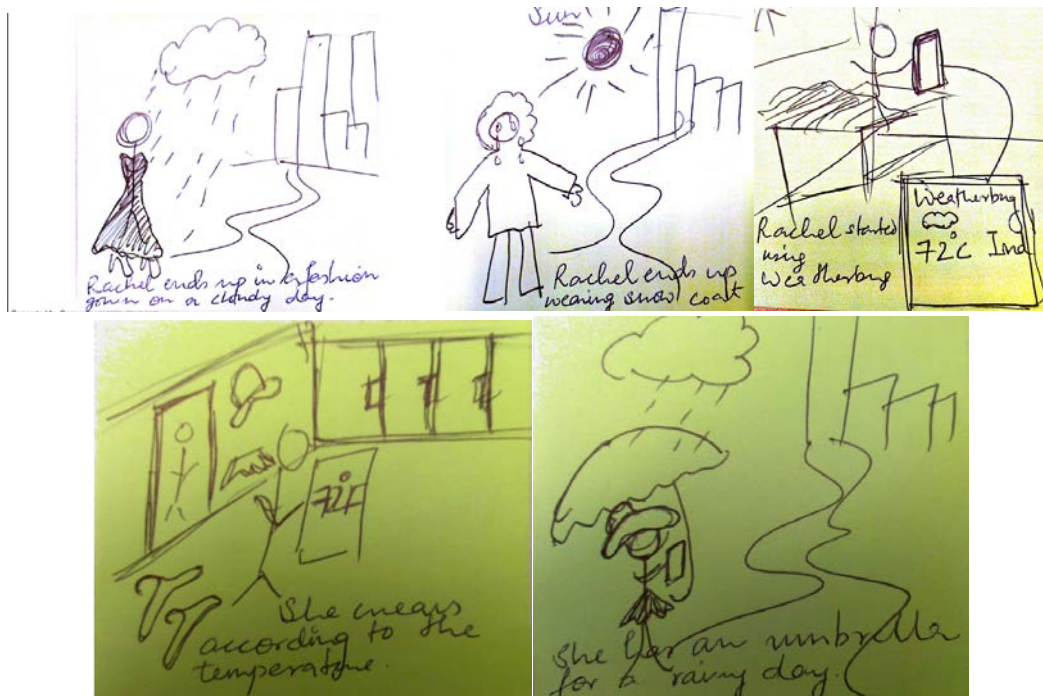
Figure 4: *Storyboard depicting the life of a college girl Rachel who ends up in inappropriate fashion statements in varied weathers.*

The Story board depicted the normal day in the life of our chosen use segment i.e. fashionistas. The storyboard also displayed how our advanced features in the application can help set up in better experience of the user.

Scenarios

Scenario 1-Rachel

Rachel is a college student. She is a fashionistas and loves to dress. She attends college in a different city as she lives in the suburbs. She often ends up inappropriate clothes according to the weather because she live in Indiana. Indiana has a very different weather in the suburbs than in Downtown. She wastes a lot of her time investing time in what to wear and investigating about the user.

Rachel has started using WeatherBug recently. The home page of the application easily displays just the right temperature and the wind. Rachel also makes it a point to look at the applications forecast every morning to look for what it suggests to wear.

As she realizes that temperatures are going to rise soon. She explores the application and the fashion suggestions. She finds her wardrobe misses many of the collections and tries to get the perfect look of the weather through the application.

Scenario 2-Robert

Robert drives long distances for his job. He needs to be aware of weather conditions in areas where he is driving. A friend and fellow driver tells Robert about the WeatherBug application and the ability to customize the home screen to include all the weather details needed at a glance.

Robert downloads WeatherBug to his smartphone and uses the customization menu to choose the information most important to him that will display on the home screen when the application launches. He needs to know current temperatures, wind chill, heat index, the extended forecast, live radar, as well as severe weather alerts. Once he makes his selections, he taps the save button and is directed to his WeatherBug home screen where he can view the changes he made.
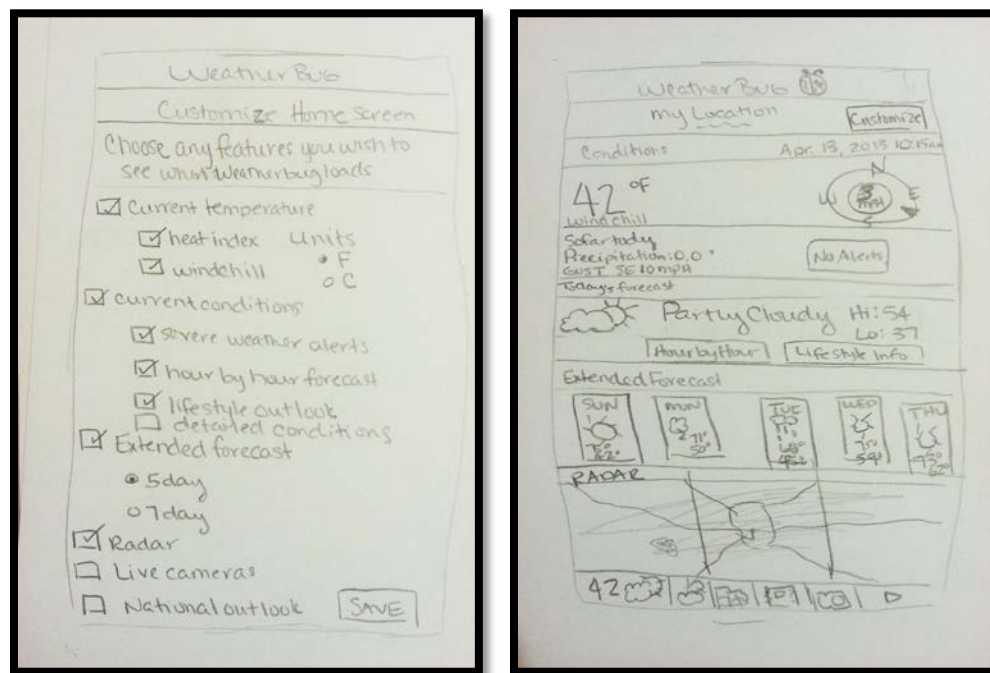
Low Fidelity Prototypes

Figure 5. *(a)WeatherBug Settings page newly designed. (b) WeatherBug home screen with Radar at bottom.*

The low fidelity prototypes resembled the WeatherBug Application with interfaces guidelines from the present application and including the new ideas.

High Fidelity Prototype

http://share.axure.com/S6JJAF/Frame_for_Desktop_View.html

Figure 6. *Screenshots of Redesign WeatherBug. Left is home screen. Screenshots on the right is daily forecast*

Figure 7. *Screenshots of Redesign WeatherBug. Screenshots on the left is hourly forecast while the right one is lifestyle forecast page.*

Comparison between Current and Redesign Versions

This section shows the difference between current and the redesign version of WeatherBug. The comparisons show in the following are based before final presentation. WeatherBug develop team update it with a latest version which is included in Appendix III. Some of the changes they made were similar to those redesign solution in this report.

Figure 8. Redesign and current versions of main screen

There are four parts in Main screen were revised. Objectives of redesigning this age are providing users better and clearer information. So that it is easier for them to use this application in more effective ways. These four parts are explained as following.

1   Location of Shortcut Access
    The current location of this access is located in the bottom of screen, beneath the advertisement area. Users have to scroll from right to left in order to select the section that they want to access. However, it is easily to click on the advertisement section. Thus, we propose to redesign this section to the top right in a icon, just like the mobile Facebook setting icon. Moreover, on the right of icon, we include label for each icon so that first-time users wouldn't be confused. We include the setting page in this page as well. The redesign of this page shows as following.
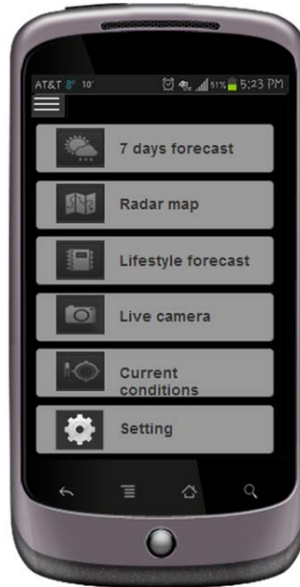
Figure 9. *Redesign of the shortcut section.*

2   Current Information
    In the redesign version, we give users options so that they can customize information
    they interested in. From the diary, one of the users only check everyday temperature, he
    think the information is too much for him in the current version. Thus, we redesigned the
    layout that information can be displayed according to users' needs.

3   Current Temperature and Wind Direction
    Since the temperature information is the most important information that users care
    about, we redesign it into larger the font size. And put the related current information side
    by side.

4   Location of Lifestyle Forecast
    The place of constant advertisement in the current WeatherBug was replaced by shortcut
    of lifestyle forecast. We expect this change can solve the annoying feeling of constant
    advertisements for users.

Figure 10. *Redesign and current versions of daily forecast*

There are two sections were redesigned in daily and hourly forecast which include navigation and information visualization.

1 Navigation among Different Type of Forecasts

The navigation of hourly, daily and current information pages was changed. Instead of access from button, we redesign these pages in tab so that users don't have navigated to the icon in upper right.

2 Information Visualization

As for daily and hourly forecasts, too much of text display. However, this kind of display is not suitable for the WeatherBug according to users' diary records. Users make decisions to change their behaviors according to forecasts such as bring a umbrella or going to jog. Thus, the most effective way for users is to visualize those variations so that users won't have to visualize those information in their mind and then make judgments.
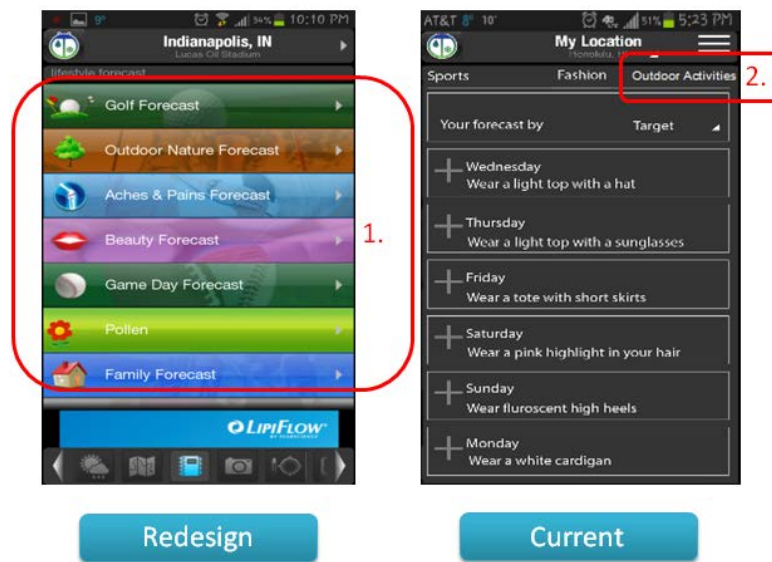
Figure 11. *Redesign and current versions of lifestyle forecast*

In the lifestyle forecast, one of the user regarded labeling were confusing since outdoor and golf are all outdoor activities. Thus, we proposed two sections that need to be redesigned.

1 Navigation

Since we change the navigation of that hourly and daily navigation into tab navigation, we change the navigation of lifestyle into same method. The objective of this changing is maintaining the consistency of system. Users can use same navigation concept through the whole system.

2 Combination of Confusing Labels

The confusing labels are golf, outdoor nature and family. Since all of these activities are similar to outdoor activities, we decide to combine them into outdoor activities.

User experience design solution

All the redesign solution starts from the home screen since it is the landing page of this application. Moreover, users check basic information frequently from this page. If they want to know more such as lifestyle forecast, they would go to next level of menu. According to the data we collected, users think the home screen contain too much information. Some are meaningful for them, but some are not. In most of time, they check temperature more often than other type of information. The other issue is the interface design like positions of shortcut access and advertisement. The following are few aspects in home screen we would like to revise.

- The change of temperature unit - When users use it in the first time, they would adjust it to the familiar unit. However, it took our users for a while to get to unit setting. They might be asked by their friends about current temperature in other unit. Thus, the change of temperature unit should be easy to access.
- Bottom access to different page - The access in the bottom is a constant part as well. In order to give larger space for following forecast, we plan to revise this part to be hidden in slid screen. The design solution toward this is similar to Facebook application when messaging a friend. Users click the icon in upper right of screen and the contact list slide in for user to click on a contact.
- Visualization of information - For example, in hourly forecast screenshots of current WeatherBug, users think it contains too much text especially for those weather observation data. It is hard for them to recognize the variation for the future. Typically, their outdoor activities and clothes decisions are made based upon that forecast. We can observe this pattern from their diary and in the artifacts model.
- Constant ads - Since the WeatherBug is free for users, the ads income become the main profit of WeatherBug. However, this constant ad is annoying for users when they use this application. We would revise this part by removing those ads. On the other hand, to make up this modification, we would include a new business model for making up this loss of ads incomes.

User Feedback

We collected users' feedback by using walkthrough and interview. The objective of walkthrough is showing redesign concepts with scenarios. As for the interview method, we expected to collect more qualitative description about WeatherBug redesign, mainly on how do users feel about redesign features. We designed standardize open-ended questions for all users so that we can see the similarities or difference opinions across users. These standardize questions are shown as following. We developed our questions from three aspects, interface redesign, features redesign and add-on value.

Interface redesign
1 *Do you notice any difference from the previous versions?*
2 *What do you think of the information layout?*
3 *How does the visualized forecast work for you when comparing to current WeatherBug layout?*
4 *Does the new settings tab and icon make sense?*

Features redesign
1 *What do you feel when you can select information you want in Home screen?*
2 *Would you regard that customized home screen is a key value for you to use this weather application?*

    3   Does lifestyle forecast makes sense in general (like all golf, outdoor, fashion etc)?
    4   How about the combination of sports, golf and family to outdoor?

Add-on value

    1   Do you think fashion forecast makes sense? (You may not be a fashionistas but maybe you can give an opinion for others)
    2   Will the application be used more if your favorite fashion stores, magazines take part in the application?
    3   Will you use it instead of going to the particular store site?
    4   Would you like to do a monetary transaction with the application?

User Feedback Summary

Interface redesign

All of users noticed the difference between current version and redesign version. They like the information layout and reasonable icons. However, one of the users mentioned the blank is too much and seems abrupt. The other point is the replacement of advertisement would be easily by those people who get use to the current interface and neglect the the new features.

Visualization of future forecast got positive feedback from user. But, the figure need to be design with careful. One of users thinks the stack chart is confusing.

Features redesign

All of users like the ability to customize main screen information. The combination of lifestyle makes sense as well. But one of the users felt confusing. She was unable to explain the reason.

Add-on value

One of the users thinks the fashion forecast is useful for him to choose correct clothes. However, two users think this is not the feature they would use. One suggestion is about the business model. She couldn't figure out what is the relationship between style and clothes for certain weather.

This business would not change our user to purchase through WeatherBug instead of going to the particular store site. Their concerns is about the browsing experience and the clothes show up only for specific weather which are probably not those he is searching for. Moreover, users might need more details before making purchasing decision. In conclusion, this business model need more discussions such as the distinguishes fashion industry and clothes forecast and considerations on how business models works in fashion industry..

Conclusion

The entire application was redesigned to reflect the android interface. Basic heuristics were followed. And results suggested. Based on our user feedback it is believed incorporating these designs into the interface would help in better experience of WeatherBug as a weather application.

Appendix

Appendix I - Users' Feedback

Interface redesign

1. *Do you notice any difference from the previous versions?*

USER1: The overall layout seems familiar, but the place where there was a banner ad was replaced by the new feature (fashion). However, I would suggest not to place the new feature there because if the user has gotten used to that spot for an ad, s/he may automatically ignore anything there, or easily relate that to an ad.

USER2: The main difference is I can buy clothes through WeatherBug. I can see the diagram of temperature versus time. Then I can quickly know the highest and the lowest temperature in a day and respective time.

USER3: No noticeable differences on the iPhone app.

USER4: Yes

2. *What do you think of the information layout?*

USER1: So information was removed. However, the blank (above the temperature) seems abrupt, and there's little white space below the temperature. Maybe reducing the height of the blank or move the temperature higher would make it better (visually).

USER2:It seems that it shows more information then I really need. I only need the temperature and when is going to rain.

USER3: I really like this layout more than the original.

USER4: It's ok. I don't understand the large space where the temperature is. It seems like something is missing.

3. *How does the visualized forecast work for you when comparing to current WeatherBug layout?*

USER1: The stack chart is confusing, and I think line chart is more appropriate to chart this tp data. Stack chart is used to depict volume (for example, precipitation), but here, the temperature is a single data point. Also, the daily view and the hour view look too similar in terms of layout and everything, and it is difficult to tell the difference effectively. Also, below the chart, what does "0, 1,2,3,4" and "1,2,3,4,5" mean? Lastly, who determine "real feel"?

USER2: It is easier for me to know the variance of temperature. But, it is better to allow me to choose showing the diagram or not.

USER3: It's nice to be able to see the trends on hourly, present and daily.

USER4: I like it. Seeing the trends will help me a lot on days when I plan to do yard work.

4. Does the new settings tab and icon make sense?

USER1: Not sure what some of the item means, but the icons are understandable.

USER2: Yes, they make sense.

USER3: Yes, but maybe find a way to make it say settings.

USER4: No. I think it is a menu.

Features redesign

1. What do you feel when you can select information you want in Homescreen?

USER1: Customization is good.

USER2:I feel the interface is good. I can select the information I want and saving time for the information I want.

USER3: I really like being able to select info for the home screen.

USER4: Selecting the information I want and need is important to me.

2. Would you regard that customized homescreen is a key value for you to use this weather application?

USER1: No.

USER2: Yes, so that I don't have to set every time. And I can see everything I want in the Home screen.

USER3: Yes

USER4: Yes

3. Does lifestyle forecast makes sense in general (like all golf, outdoor,fashion etc)?

USER1: I think it's better to clarify between a style forecast as in the fashion industry versus what to wear for certain weather. For example, I can understand a suggestion like wearing short skirt as related to weather, but I don't understand if wearing high heels or adding color to your hair have anything to do with weather.

USER2: Yes, it helps me to decide if it is suitable for doing activities.

USER3: I think adding those would be nice. It's good to have pairings with activities and conditions.

USER4: Yes

4. How about the combination of sports, golf and family to outdoor?
USER1: A bit confusing.

USER2: Golf is one of the outdoor activities, so the combination makes sense.

USER3: I think adding those would be nice. It's good to have pairings with activities and conditions.

USER4: *That makes sense to me.*

Add-on value
1. Do you think fashion forecast makes sense? (You may not be a fashionista but maybe you can give an opinion for others)
USER1: See comment above.

USER2: Yes, it saves my time from choosing clothes. Moreover, I can shop online if I don't have such cloth.

USER3: Not for me but I can see how it could be a good idea to market products with conditions.

USER4: It makes sense, but it isn't something I would use.

2. Will the application be used more if your favourite fashion stores, magazines take part in the application?
USER1: I think to involve some fashion blogger would also be helpful.

USER2: Yes, so that I can buy clothes from stores I used to buy.

USER3: I would not use it but it might be good for someone else.

USER4: Not by me, but someone else may be interested.

3. Will you use it instead of going to the particular store site?
USER1: Of course not. The browsing experience is very different.

USER2: No, because the cloth shows up only in particular weather and it is hard for me to buy clothes at will.

USER3: No

USER4: No

4. Would you like to do a monetary transaction with the application?
USER1: No. Would need far more details (at least larger pictures) before making a purchase decision
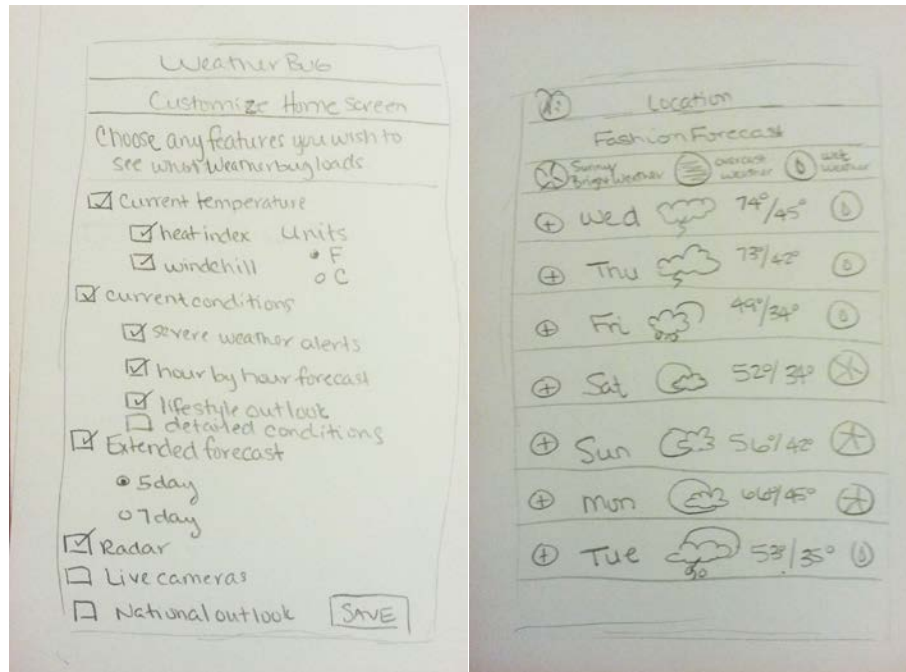
USER2: Yes, if I find the cloth I like.

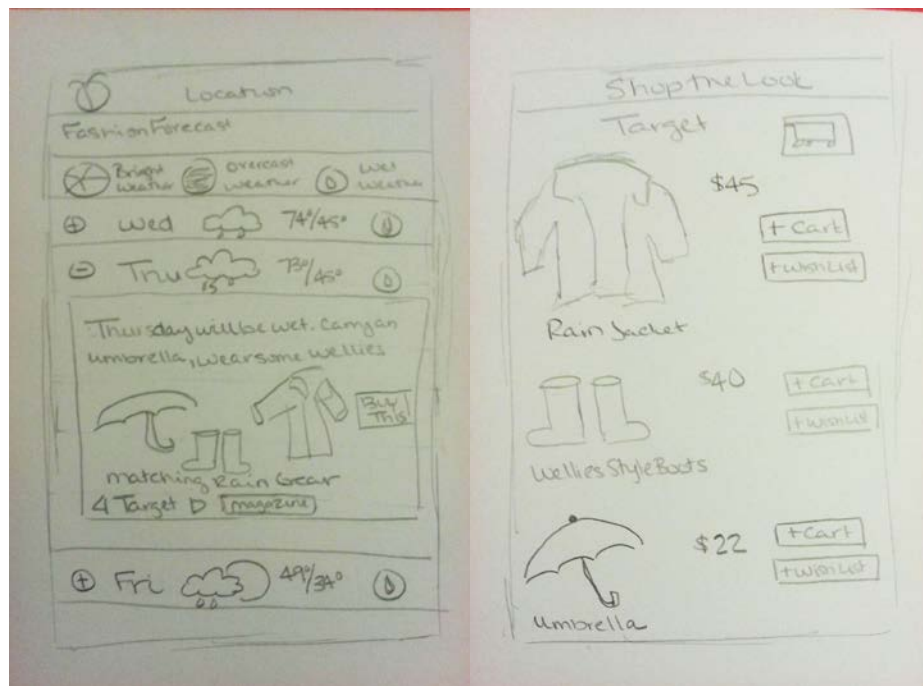USER3: Not something I would partake in.
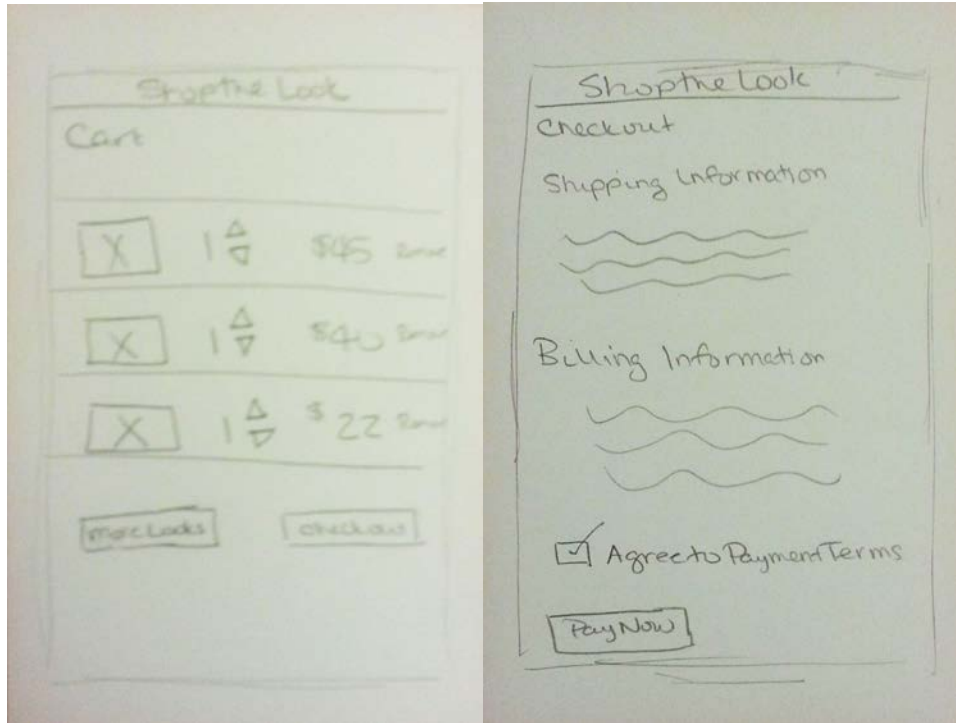
USER4: No

Appendix II- Paper Prototype

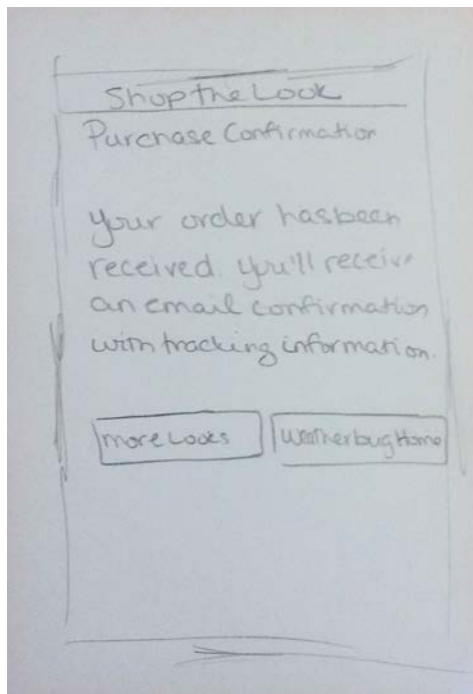The low fidelity prototypes has been sequentially arranged

(a) Settings (b) Hourly Display

(c) Fashion Forecast (d) Detailed display individual page

(d) Shopping/ Checkout Pages

(e) Final Purchase Pages

Appendix III Updated WeatherBug after Final Presentation

We accidently found that WeatherBug updated version after final presentation. The team made big change in the interface especially in navigation. Some of those changes are similar to those proposed redesign by our team. We include comparison of these similar design as following.

Redesign

Current

Current-Updated on May 1st.

Redesign

Current

Current-Updated on May 1st.