

\$anity

Assignment 6 - Sprint 2 Document

Hitchhikers 2.0

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1. Preface

1.1 - About/Mission

This document serves to produce the definitions, specifications, architectural/detailed designs, requirements, and implementation for \$anity, a mobile finance application that allows users to create a budget across a variety of categories to which users can easily specify when they spend money. As an implementation specification, this document shall include changes of design decisions that are different from Assignment 2, and the reason of the changes as updated from comments from Sarah Cooney and the CSCI-310 document grader.

1.2 - Intended Audience

The intended audience for this implementation document are all parties of the development cycle of \$anity: the client of the \$anity app, Sarah Cooney, who has commissioned the software and is in charge of clarifications, and the developers of the \$anity, thereafter.

1.3 - Version History

This section will be updated as \$anity continues to be expanded and new features are implemented as well as a rationale for why these versions were finalized.

- Version 1.0
 - Delivered as of **October 18th, 2017** under conditions specified in Assignment #3. Current application has been written to standards specified by Sarah Cooney with notable exception of certain push notifications which were later clarified with her (in-app notifications will now be allowed) and time frame table which will be implemented in further versions of \$anity.

- Version 1.1
 - Delivered as of **October 30th, 2017** under conditions specified in Assignment #4. Current application has been updated to include new functionalities improvements include:
 - Addition of text boxes that allow for frequency and time period for budgets/categories
 - Pie Chart for users to engage with
 - Users are able to make budgets and delete them
 - Google Maps Integration to locate transactions over previous transactions
 - Testing document completed for versions completed in *Version 1.0* under assignment regulations by Professor Nenad Medvidovic
- Version 1.2
 - This versions follows implementations written in Sprint 1 as of **November 8th, 2017** and are specified in Assignment #5 - Sprint 1 Document which was turned into Professor Nenad Medvidovic and customer Sarah Cooney. Some new features that were added as a result are:
 - Setting Limit for Category - A limit is set for each category, based on the larger budget set for each category. For example, if a category has a budget limit of \$1000, the categories should only allow up to \$1000 as a ceiling limit.
 - Transaction Limit Exceeded - If transaction will cause limit to be exceeded, a negative value should be displayed on the history page as well as the memo/transaction page.
 - Default Spending Threshold - Must be a default spending threshold at which a notification first sent.
 - Default Frequency - Must be a default frequency for notifications thereafter.

- Budget Notification for Time & Budget - Notification should specify budget, category, amount left in the category, specify time remaining in the budget period.
- Limit Notification for Category - User should receive a notification when limit has been exceeded in a category.

2. Daily Scrum Meetings

In this section we shall be discussing the daily Scrum meetings that went into Spring 1. In order to provide clarity and ease of read, we will be following guidelines that adhere to answering the following questions when discussing the Summary of Performance:

- **What did I do yesterday that helped the team meet the Sprint goal?**
- **What will I do today to help the team meet the Sprint goal?**
- **Do I see any impediment that prevents me or the team from meeting the Sprint goal?**

2.0 - New Project Requirements

Something that needs to be addressed is that Sarah Cooney added some new functionalities for \$anity which will be slowly implemented. Not everything will be completed in this sprint but it's important to clarify her new goals.

Project 3 (Customer: Sarah Cooney)

Functional:

1. Create automatic transactions which occur on a given date. For instance, an automatic deduction from the entertainment budget for Netflix on the 15th of the month.
2. Receipt Scanning for entering transactions.
3. Rollover of leftover money in categories from period to period.
4. A savings category without limit that extra money is rolled into at the end of the period.
5. Support for adding multiple items to different categories on one transaction entry form.
6. Shared budgets to which multiple users can add transactions.
7. All the other "core" functional requirements listed in the Requirement List

Non-functional:

8. Improve the performance (speed) of your system
 - a. Identify at least two common user behaviors that will potentially cause long response time, and provide a way for each case to reduce the response time in your implementation. You need to show the response time is actually reduced. E.g., you should record the response time before and after your improvement. Please feel free to use external tools.
 - b. Extra points will be considered if 1) you can simulate your test cases (before and after improvement) under different network conditions; 2) you can replay your test cases automatically (e.g., using [RERAN](#))

2.1 - Scrum Meeting on November 13th, 2017

Time: 3:30 PM - 5:15 PM

Meeting Location: New Cafe 84 Starbucks

Summary of Performance:

Adam Espinoza

- Did not complete anything yesterday as this was our first meeting for Sprint 2.
- Created Sprint 2 Document & came up with another Backlog 2 Document with new things that we need to continue working on for this sprint such as consolidating.
- Today, I will plan on completing all of the 'skeleton' for the document that way it's easier for other members in the team to add their own text to what they did for the day. In addition, I'll be working on the SCRUM review for the team at the end of the session.
- No impediments since I'm working on the document and am not creating any conflicting problems for the rest of the team that has been working on the application.

David Sealand

- Roadmapping and planning for Sprint 2.
- Goal is to research timestamps and date formats in Java to implement for the period frequencies.
- No foreseeable impediments.

William Wang

- Roadmapping and planning for Sprint 2.
- Goal is to start research and implementing the "change notification frequencies and updating budget period" functionalities
- No foreseeable impediments at this current moment

Aneel Yelamanchili

- Roadmapping and planning for Sprint 2.
- Researching different methods of how to effectively create a settings screen for period updates.
- No foreseeable impediments at this current moment.

2.2 - Scrum Meeting on November 14th, 2017

Time: 4:20 PM - 8:00 PM

Meeting Location: LiteraTea / Doheny Courtyard

Summary of Performance:

Adam Espinoza

- Wrote Scrum Meeting goals and Review for November 13th 2018, where I discussed where our project when during the meeting time period and the new changes that we made.
- Research in-app notification with Aneel to see how to work with XCode.
- Assist Aneel and Will if they need any additional help in writing XCode methods to make the process easier (or run Ngrok for them in case Sealand needs to charge his computer).
- No foreseeable impediments at this current moment

David Sealand

- Researched and began implementing dates in the Java backend and MySQL database for the period frequency resets.
- Continue implementing the dates in Java and storing them in an easily repeatable format. Also, making sure that the logic behind period resets is correctly implemented so that the number of days left before a reset is updated even if a user doesn't open the app for multiple days.
- No impediments currently.

William Wang

- Began implementing update budget period. As a refresher: The budget period is the period that the budget goes on for until it gets reset. Each

budget has its own period, which is created on addition. However, Aneel and I began integrating the update budget period into the settings view that he is working on.

- Planning on finishing implementing updating budget period and notification threshold feature, but will work on next Scrum meeting if necessary.
- No impediments at this current moment.

Aneel Yelamanchili

- Began implementing a settings view for updating period times and ranges.
- Helping William finish off the rest of the the in-app notifications.
- No foreseeable impediments at this current moment.

2.3 - Scrum Meeting on November 15th, 2017

Time: 4:30 PM - 7:00 PM

Meeting Location: New Annenberg Digital Media Lab

Summary of Performance:

Adam Espinoza

- Yesterday I worked on the Scrum Review for the meeting we had for our second meeting November 14th, 2017 with some help from Sealand and Aneel.
- Assist Aneel and Will if they need any additional help in writing XCode methods to make the process easier (or run Ngrok for them in case Sealand needs to charge his computer).
- Will help Will and Aneel implement the bar graph in order to show the last six periods.
- Solve any merge conflicts that occur on the GitHub repository.
- No foreseeable impediments at this current moment

David Sealand

- Finished implementing the period resets giving a set period and notification frequency.

- Start planning and implementing customizable notifications based on editable percentages that the user inputs based on when they want to see notifications. Researching how to parse different strings that the user may enter and then storing them to be used.
- No current impediments.

William Wang

- Finished implementing update budget period and notification threshold stories. Began working on update notification frequency. As a refresher: the notification frequency is the notification that will be sent depending on how far along in the period you are, regardless of your current spending, i.e. 50% of the way through your period, you have 5 days left in budget (x).
- Planning to integrate all the update functionalities (budget period, notification period/threshold, budget name, budget amount) into the settings view.
- No impediments at this current moment.

Aneel Yalamanchili

- Finished implementing the settings view controller.
- Did tests to make sure Sealand was receiving messages on the backend in the proper format.
- Planning to work with Will to implement the bar graph in order to show the last six periods of spending.
- No impediments at this current moment

2.4 - Scrum Meeting on November 16th, 2017

Time: 2:30 PM - 8:00 PM

Meeting Location: West Annenberg Lobby Area

Summary of Performance:

Adam Espinoza

- What I did yesterday I worked on creating the Scrum Meeting goals & Review for November 15th, 2017.

- Will look into MongoDB as an alternative to mySQL database because I had recently heard that MongoDB was useful for creating non-relational databases.
- Also going to work on making sure that there aren't any problems with merging or logistics problems with the site.
- No foreseeable impediments at this current time.

David Sealand

- Finished implementing customizable notification thresholds for time periods and for limit thresholds. The user can now input as many thresholds that they want notifications for and they will be stored and checked.
- Next step is to work on implementing history of categories for the last 6 periods. I need to plan how to best store the data from the categories effectively.
- No current impediments.

William Wang

- Had some issues integrating the notifications into the application through the Client.swift file. Began looking into potential solutions.
- Working on having each notification specify the budget, category, amount left in the category, specify time remaining in the budget period. Looking into the flow for getting all the information into each notification.
- Will start working on helping Aneel with any impediments with the bar graph.
- No impediments at this current moment.

Aneel Yelamanchili

- Almost done with the bar graph analytics. Finishing up sending and receiving messages on the backend for this functionality.
- Planning on fixing a bug with Will where the bar graph color is not properly changing.
- No impediments at this current moment.

2.5 - Scrum Meeting on November 17th, 2017

Time: 6:30 PM - 9:00 PM

Meeting Location: New Cafe 84 Starbucks → Kings Hall

Summary of Performance:

Adam Espinoza

- What I did yesterday I worked on creating the Scrum Meeting goals & Review for November 16th, 2017.
- Plan on helping Sealand work on category overflows from a backend standpoint in case he needs me. Looking into possible UI/UX updates to make for the application, such as changing the layout.
- No current impediments at this current moment.

David Sealand

- Finished implementing the history of the amount and total amount spent for categories over the last 6 periods. Ended up creating a new MySQL table that stores no more than the last 6 periods so that no extra data is saved which would waste space. Whenever a budget is reset, if there are already 6 saved in history, one is deleted and the new one is added.
- Plan to work on category overflows and figuring out what makes the most sense for the user in terms of saving. When a budget is reset, any leftover money should be kept track of for the user's benefit.
- No current impediments at this current moment.

William Wang

- Helped Aneel fix a bug where the bar graph was not updating properly
- Found and fixed a bug where the previous six periods array was not updating after every refresh, so the app was crashing at every reload, but not on the first time
- Finalizing all update functionalities in the application and making sure that every update actually goes through and all budgets and categories reflect the changes immediately.

- No current impediments at this current moment

Aneel Yelamanchili

- Finished fixing the bug where the bar graph was not updating properly or changing color with Will.
- Planning on helping fix any bugs that come up during development by either Will, Adam, or Sealand.
- Will work with Sealand on backend changes and updates.
- No impediments at this current moment.

2.6 - Scrum Meeting on November 18th, 2017

Time: 4:36 PM - 6:00 PM

Meeting Location: Kings Hall

Summary of Performance:

Adam Espinoza

- Helped Sealand create the category overflow and annual savings budget.
- Will finalize the Assignment Sprint 2 Document to turn in at the end of the day.
- No impediments at this current moment.

David Sealand

- Implemented category overflow by storing an annual savings budget for each user that cannot be deleted or edited. They can add transactions to the budget so they will be able to track how much money that they saved over the past year and edit their budgets appropriately.
- Will finalize the Assignment Sprint 2 Document to turn in at the end of the day.
- No impediments at this current moment.

William Wang

- Made sure all parts of the application with regards to the update functionalities are running correctly and worked with Sealand to make sure that all changes are reflected in the backend and front-end simultaneously and that the app does not crash.
- Will finalize the Assignment Sprint 2 Document to turn in at the end of the day.
- No impediments at this current moment.

Aneel Yelamanchili

- Planning on looking into ways to improve the app further with new features.
- Will finalize the Assignment Sprint 2 Document to turn in at the end of the day.
- No impediments at this current moment.

3. Sprint Review

This section is for an overall review done at the end of every Sprint. We will review the work that was completed and the planned work that was not completed. Also, we will reflect on the past Sprint, identify and agree on continuous process improvement actions.

3.1 - Review of Scrum Meeting on November 13th, 2017

Time: 3:30 PM - 5:15 PM

Meeting Location: New Cafe 84 Starbucks

Summary of Performance: Sealand was researching what was the cleanest way to store the period dates based on the user's input because he found it difficult to translate between a Java and a MySQL date format. Instead, he used Java DateFormat to format all dates in the same way so that they could be compared to each other and stored as a simple MM/DD/YYYY string in the database. He began implementing the customizable dates that the user could input. Aneel planned to do research regarding how to properly create a settings view controller. To do this, he looked at different design patterns and flows to preserve a functional user experience. He then decided what data would be mutable within the settings view. From there, he planned out how to actually implement the view controller and view itself. While William was researching about updating budget periods and changing the notification frequencies, he realized that there would have to be a lot more coordination with Sealand than he had initially thought, because a lot of the updates will be happening in the SQL table and bubbled up to be reflected in the iOS app. However, since the team meets pretty frequently, this would not be too big of an issue. While Aneel was looking into how to create a settings view controller, William looked into how to integrate the update functionalities into it. Adam was mostly working on the documentation which was essentially the same thing from the first Sprint, structure wise at least. He consolidated the list of things that were from the backlog document from the Sprint 1 document, by removing the things we already accomplished and then started talking about things that we need to implement first. We didn't wanna lose points so we had to ensure that all the base requirements were finished.

3.2 - Review of Scrum Meeting on November 14th, 2017

Time: 4:20 PM - 8:00 PM

Meeting Location: LiteraTea / Doheny Courtyard

Summary of Performance: Aneel started implementing the settings view controller. As a result of his research, he concluded that changing period notification times, changing periods themselves, and updating budget names would provide the user with the most functionality and control over their financial experience in the app. Aneel also began to help Will implement the remaining in-app notifications that were not completed as part of Sprint 1. Sealand finished cleaning up the date formatting in the Java backend and MySQL database and performed a bunch of tests with Will and Aneel who were working on the user customization. He then began figuring out how to implement Period Updates when a user does not enter the app for long periods of time. He found that working with Java dates was effective in finding the number of days between different dates. While William was implementing the update budget period functionality, he encountered a bug where the budgets weren't actually updating when the back button was pressed to go back to the budget view. After looking into what the issue was, he realized that a new refresh query had to be sent to the backend in order to get the updated JSON with the new, updated information. He implemented the refresh query, and the update budget period functionality seems to be working. Further testing must be done to ensure proper behavior. Adam ended up helping Aneel do research with notification times and found some things that supplemented information that Aneel found when he was doing his own research. In addition, he also switched to working on the documentation for the day to ensure that all changes were to the level that were necessary for this assignment. Through this we were able to complete the goals for the meeting.

3.3 - Review of Scrum Meeting on November 15th, 2017

Time: 4:30 PM - 7:00 PM

Meeting Location: New Annenberg Digital Media Lab

Meeting Summary: After doing some testing to ensure the update budget period functionality is working correctly, William has concluded that the functionality is indeed done. He began researching how to integrate all the update functionality into the settings view controller that Aneel is simultaneously making, and how to get all the information from the settings view controller to the backend so that Sealand can process it and send it back in another JSON message. Research was going well so far, and it looks to be very doable. Sealand implemented customizable period frequencies based on if the user edits the budget details. Before, the period was set at creation time but now is editable and will be updated in the MySQL database. Research was also done into parsing strings spliced by commas, spaces, and other characters for customizable notifications. Adam ended up finding out that MongoDB wasn't too helpful for what we were doing. There were some features that would have been cool to implement as part of this project, but it would require the team to learn a new language and refactor a lot of code (which would be a huge waste of time). Aneel finished implementing the settings view controller. After implementing this feature in the Swift front-end, he helped Sealand properly receive the sent data in the backend. He made sure the messages being sent to the backend were properly formatted and able to be stored in the database.

3.4 - Review of Scrum Meeting on November 16th, 2017

Time: 2:30 PM - 8:00 PM

Meeting Location: West Annenberg Lobby Area

Meeting Summary: Sealand researched how to most efficiently and accurately read in a string of threshold percentages with splicing. He found that a simple comma splice was most effective. Testing was executed with Will and Aneel to ensure its success. The notification function was updated to reflect the customizable notifications based on the entered percentages. He also worked with Aneel on the messages passed between the frontend and backend regarding the history of categories. Aneel was almost finished with implementing the bar graph functionality along with Will. He finished implementing the connection between the frontend and the backend for the bar graph and found a bug

where the graph does not properly update when changing the color of the graph. In addition, Aneel found whenever 'updateGraph()' is called, the number of periods shown is not correct. William had some issues integrating notifications into the application through the Client.swift file, because while the notification functionalities were working mostly fine, when a period notification is sent right when the app is opened, the notification will not show. After researching, William realized that the reason for the bug was because when the app prompted for TouchID input, the TouchID box was a new viewcontroller, which threw off the refresh query. William fixed it by changing the refresh query to point to the view controller underneath, after dismissing the TouchID view. William also began integrating the update period functionalities into the UI, into the settings view. Adam helped Aneel and Will come up with additional help such as running ngrok during the meeting when Sealand's computer wasn't working. In addition worked on helping Will and Aneel create the graphs in order for the previous period. There weren't thankfully any updates that needed to be resolved on Github.

3.5 - Review of Scrum Meeting on November 17th, 2017

Time: 6:30 PM - 9:00 PM

Meeting Location: New Cafe 84 Starbucks → Kings Hall

Meeting Summary: Sealand implemented storing the data for the history of the last 6 periods for each category. His research and planning led him to create another table in the database that stored each category with its ID along with another identifier with how old the category is. When a budget is reset, the category data is then saved in the history table and will delete another historical category when 6 are already being stored. Sealand also created the JSONObject to be sent back when the user wants the bar graphs to be populated. Aneel and Will finished fixing the bug that was found where the graph did not update on a color change. They found that whenever the graph was getting an update call, the number of periods to display was getting doubled. After fixing this bug, the graph properly functioned and showed the last six periods of budget spend. William finished integrating the update functionality features into the settings view, and began testing to

see if the features are all getting properly updated and sent back by Sealand's backend. After testing, William concluded that the update functionalities are working correctly, and can be pushed with confidence. William also helped Aneel fix a bug where the bar graph was not updating correctly. After finding and fixing the bug, the bar graph is working properly. Adam did some research on UI/UX on Dribbble and looked potential prototype designs that could be implemented. Also looked into tools such as Origami for creating layouts that could export to .png and .jpg that we could use to create a more professional look to the phone application.

3.6 - Review of Scrum Meeting on November 18th, 2017

Time: 4:36 PM - 6:00 PM

Meeting Location: Kings Hall

Meeting Summary: William spent a while working with Sealand to make sure that all functionalities that were implemented were all working properly from the frontend to the backend. After working with Sealand, it was concluded that the application functionality is indeed done. William also began finalizing the Sprint 2 document with the rest of the team. Sealand finished testing all of the functionality that he added and continued to add to the Sprint 2 document. After the final scrum, Aneel started looking into ways of improving the app and adding features for the next sprint. He also began finalizing the Sprint 2 document along with Adam, Sealand, and Will in order to turn it in by November 20th midnight deadline. Adam spent the ending time making small revisions here and there to ensure quality for the final sprint. There was a couple things that needed to be rephrased, but all in all the document came together.