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HONORS COLLEGE SENIOR ENGINEERING GROUP PROJECT - WHATCHAMABUDGET

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HONORS COLLEGE SENIOR ENGINEERING GROUP
PROJECT - WHATCHAMABUDGET

by

ROSHAN SHRESTHA

Presented to the Faculty of the Honors College of
The University of Texas at Arlington in Partial Fulfillment
of the Requirements
for the Degree of

HONORS BACHELOR OF SOFTWARE ENGINEERING

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May 3, 2020

ABSTRACT

HONORS COLLEGE SENIOR ENGINEERING GROUP

PROJECT - WHATCHAMABUDGET

ROSHAN SHRESTHA, S.E.

The University of Texas at Arlington, 2020

Faculty Mentor: Shawn Gieser

WhatchamaBudget is a powerful application that presents the user with their budget in a personalized and much better way than having all the bills set up and written down on a notebook. It is more than just a budgeting application. It provides a clearer view of how the budget and expenses have been handled until now and reflects on ways to make it better. Income, savings and expenses are the basic day-to-day pedestals that should be kept track of. People often disregard budgeting unintentionally, thinking it as a minor part of their life. The application provides an easy interface and updates for any user and helps keep track of their savings for a goal they can easily set up.

The desktop application consists of a frontend, a backend and a database to hold user information. The project is based on the design principal “KISS” which stands for “Keep It Simple and Stupid”. Working on the frontend part of the application, I had to research the design of the application and the implementation of its contexts. The design is

simple as it should be with better user interaction and interface. The backend basically handles all the API and the banking information section including the database.

The whole team has invested hours and effort in research and developing new ideas to integrate the project, where the application can provide its features at its best. The major features of the application are goals setup, budget setup, transaction view and transaction modification in accordance to users' needs, demo and overview. The application has a basic sign in and sign up process, with which the users can create a personal account and have all the transaction and budget data stored in. The user will also have the ability to connect to his/her bank accounts once the account is set up. With the completion of the account set up, the application provides transparency between the user and how the budget is handled for the goals.

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CHAPTER 1

INTRODUCTION

1.1 Whatchamabudget

Whatchamabudget is not just a simple budgeting application. The idea of “Whatchamabudget” originated as a simple budgeting application with basic features that would allow the user to manipulate their budget. The big picture of the application grew along with the developers’ progress achievement on the application. With features such as banking API, Demo, the application provides easy interaction and versatility for any user. The demo feature on the application is implemented that provides users with mini features of the actual application. The application as well as the Demo feature are further discussed. Having a good design is another essential criterion for the dashboard development as a good design makes users efficient. The application has the scope of being use in an industry as well as personally (Cooper).

1.1.1 The Budgeting Application

The application consists of a frontend section and a backend section, which included a database. For the overall project, team members were divided into groups of three and two in order to handle the front-end section and back-end section respectively. Talking about the functionality of the application, it provides a customizable user dashboard with statistics about the user’s budget. It allows a secure connection to the user’s bank through Plaid API with ability to create user defined or preset goals. User will be able to set the budget in accordance to that goal and keep track of the progress or any details.

All the user data is stored into a database in order to retrieve personalized dashboard/account.

The application theory is based on the software design principle KISS (Keep It Simple and Stupid) and is focused on three budgeting styles, 60/40 budgeting style, balanced money formula (50/30/20) and envelope budgeting where budgets are separated into saving and related expenses respectively. The application is accessible through any web browser by creating a new account or logging into one if it already exists. The user will be able to access the personalized dashboard on which financial information such as banking details, goals, budgets, overall statistics can be set and accessed. User credentials as well as other personal information gets stored into the database for use. The following figure shows the overview section of the application which includes graphical representation of a dummy user with dummy values.

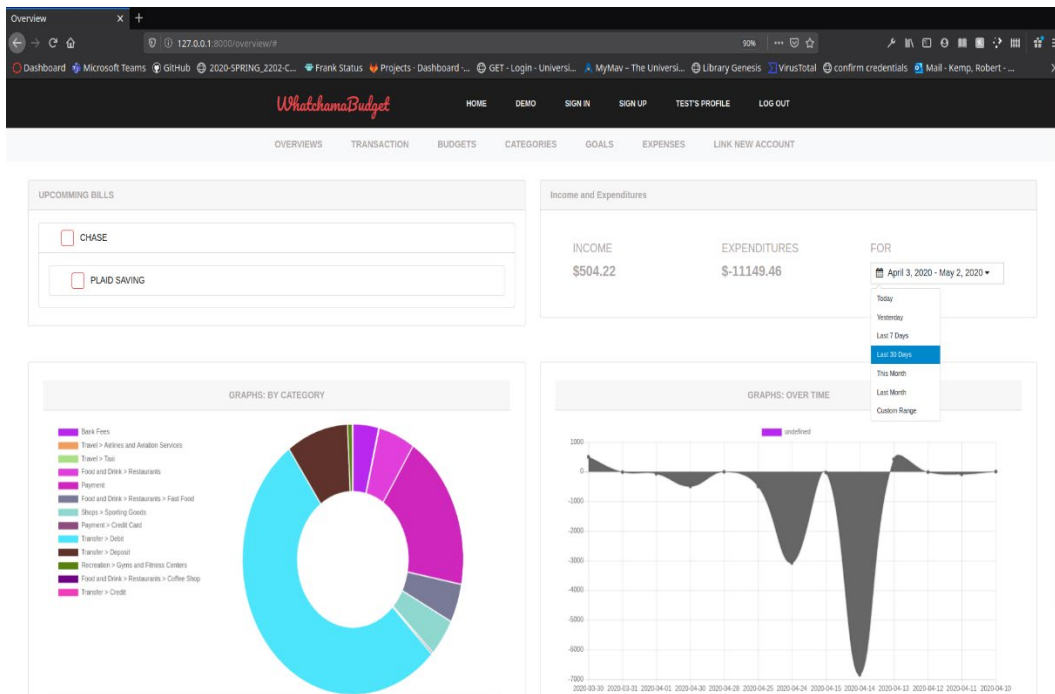


Figure 1.1: WhatchamaBudget Overview

1.1.2 The Application Demo

Even though the group has tried their best to make the application simple in order to aid user interface, the application still needed a feature that would provide a quick introduction on the application without having to go through sign up process. The demo feature on the application provided the best solution for the issue. It acts as a visual and interactive guide to introduce users to the key features of the application. This feature will be useful to introduce any new implemented feature to the user without the onboarding process, providing better client-service transparency and a perspective of how their budget will be handled.

The application demo consists of four sections; demo introduction, mini goals which includes the goals and expenses section and finally an overview of the overall budget. Demo features provides an interactive experience for any first-time users, where they will be allowed to set goals, selecting their goal amount, budget amount and time period. Expenses section will have the deductibles that will be subtracted from the budget amount. The overview section includes a pie chart and a bar graph of the overall budget. Every time the user changes the values and submits them, the overview section will automatically generate its charts. The idea of the demo feature is not to have that data stored into the database. Since there could be multiple users who would test the application through demo feature, there would be high amount of data stored into the database which would not be used in the future.

CHAPTER 2

LITERATURE REVIEW

2.1 The Application Implementation

The WhatchamaBudget application consists of a front-end, a back-end and a database as previously described. For the front-end of the application, programming was done in html, CSS and JavaScript. The preparation of the page layout was coded in html whereas all the page properties were formatted in the CSS files. It was important to have the same basic layout and uniformity among all the pages. The application required forms where the users are allowed to fill in their credentials as wells as financial information regarding their goals or budget. Going in detail about the intended audience of the application, anyone who is managing their financial status or planning to get information about financial management, could easily interact and understand application features. The design of the application is to better application-user interaction with versatile functions. Interaction with the application will not require any tutorial or prerequisite software installation. The front end of the application includes a dashboard for better user interaction with features. It acts as a guild of interlocking patterns and components which consists of specific entities that the user needs to view (Tidwell).

One of the major intentions of the application is to introduce users to more ideas on how their budgets can be managed and increase their skills and perspective on financial issues. The application also helps users to plan and prepare for future scenarios in terms of

budget. For example, if there is an event coming up, the user can allocate certain portion of the budget towards that event. The application also allows keeping track of that goal.

2.1.1 Demo Page Implementation

With the consent and agreement of all the team members, the final version of the demo feature will be applied to the application. Desktop Virtual Environment (VE) would allow the application to have instructional and informative interfaces for the users (Polys). The demo page on the application holds similar features where the page layout is created using html and the formatting of the page is done in CSS. The page consists of a form as a part of the page instead of a pop up and is linked with the overview section on the page where the overall budget and the goals are represented graphically. Unlike other pages on the application, the demo page is not connected with the application database to store any kind of data. Data entered on the mini budget and mini goals under the demo page are directly connected to the mini overview section that provide a pie chart and a bar graph representation. The following diagram shows the demo page of the application.

CHAPTER 3

METHODOLOGY

There was some research that was done before the front-end design was implemented. Research was done to have more ideas about the demo feature, and the context layout. Some of the primary methods used were coding trials and participant observation and feedback. The above methods were implemented in a different time frame during the front-end integration and level of completion of the features. Coding trials as a methodology was initially used as a trial and error for the programming part, while participant observations and feedback were mostly used during the layout implementation. Group members were mostly active in providing the feedback as feature's layout had to have the uniformity for a standard presentation of the application. In addition, context and user observation of similar applications provide me a base to start off with (Sauermann).

3.1 Coding Trials

Coding trials is the initial methodology used during the planning phase of the application layout. HTML, CSS and Java were the major platforms used for the demo page as well as the goals page which needed some research before implementation. Resources such as online books, videos, and tutorials provides more knowledge in utilizing the full resources of those platforms. After getting familiar with those platforms, numbers of trials and errors were performed while implementing the front-end code.

The GitHub application was used to keep track of the version of the application and integrate codes from group members. With the version control application and the coding platform being set up, there were a number of trials for each webpage which was reviewed in every sprint of the group meeting. GitHub provided support in the scenario where we had to go back to the older codes and take it as a reference without having the trouble of lack of information about code and the authors.

3.2 Participant Observation

Participant observation methodology was used during the coding process rather than implementation. Each group member served as a reviewer for each other's code. Since the demo page was part of the honors project, I personally had to be observant of my own code and implementation styles. I had many changes and updates made to match the page to my expectation. While some of the implementation methods were difficult to achieve, I had to go back to previous versions of the code and mock the implementation styles. For example, I tried to have the demo page not interact with any of the database. Since, it would only occupy space for every data that users would enter, it was best not to have that stored in a database. The probability to that particular set of data being used again was less.

3.3 Participant Feedback

During the final implementation of the layout of the application including the front end and the back end, the group had a discussion on further enhancement of the application. Every group member had reviewed the application and provided feedback. The feedback was observed and separated on the basis of possibility in case of deadline and their functionality. All the possible enhancements and tweaks to the application were implemented onto the system. At this time, the system was almost ready to submit, so we

did not have to modify much of the already existing implementations. This was pretty helpful in regard to the final product, its completeness and its outlook.

CHAPTER 4

DISCUSSION

Implementing the demo feature on the WhatchamaBudget application was crucial to the program which required high level of research. Any product requires demonstration for marketing purposes. Demonstration can be of different types depending on what that product is related to or what that product is based upon. With similar intention, I believed that best way to demonstrate the capability of the program to the audience was to have a feature included in the application itself. Research was done on how the demo feature would be implemented. Some of the ideas on first trial was to have a video demonstration of the complete application or to describe and list out application's capabilities. A picture speaks more than a thousand words but having a User Interface as part of the demo would be more appealing to the audience.

4.1 Demo Feature as a Product Conveyance

I believe the demo feature of the application has increased the quality of the product as a form of marketing and by representing the application among the audience. This product demonstration will help users get a prospect interested and excited about the solution to financial and budgeting problems. It serves as an effective way to address specific product related functions and services. The user will not be able to access the application features until they have created an account by signing up. This feature will act as a bridge that would connect users' expectation and showcase application capabilities. It also helps users avoid any application related misinformation and combat any concerns.

The key of the application is to provide users with management of their budget and develop their perspective towards having a financial goal. The demo feature will ease users' concern about any doubts and queries regarding how the application actually functions.

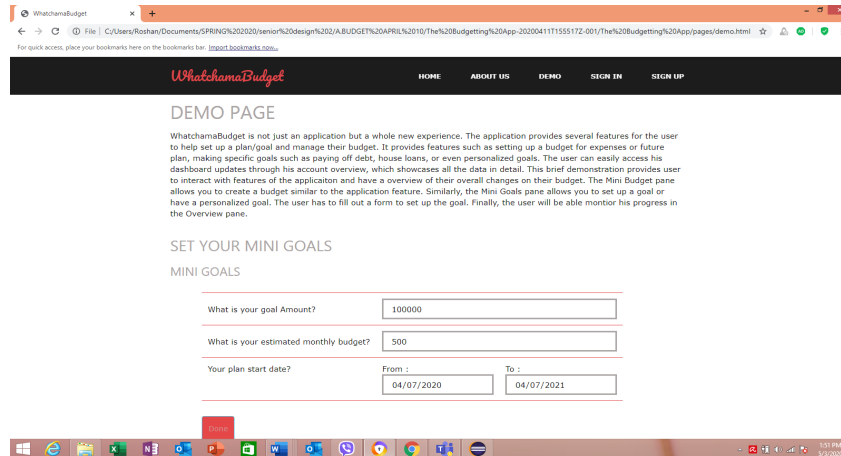


Figure 4.1: Demo Page 1

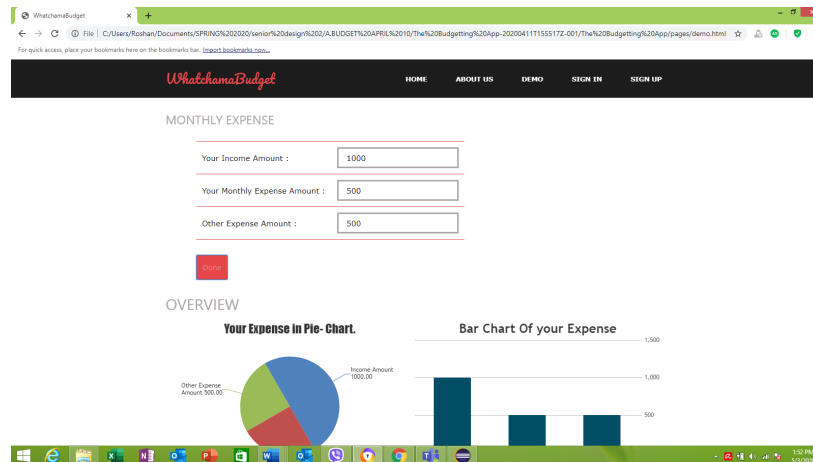


Figure 4.2: Demo Page 2

CHAPTER 5

CONCLUSION

There is no doubt that keeping track of one's income and expenses play an important role in everyday life. People often get sidetracked when it comes to managing their budget goals and expenses. The Whatchamabudget application provides a solution to all of the budgeting problems and does the tedious part for any user. There many features such as personal bank account connection, security, keeping track of budget, setting a savings goals for future that allows the user to handle all the financial activities easily. For the HRS, this report is majorly focused on the demo feature of the application which provides an interaction with application features without onboarding.

5.1 The Application

The application is itself an experience for any user towards a better understanding of their finance. It allows users to have different perspective towards their budget and gives users an opportunity to manage their budget targeting any goal. The application provides user friendly features that help the user connect to any banking account securely, as well as financial statistics, budget creation feature and goal creation feature. Once the account is set up, the user will be able to add or keep track of their bills and any transaction that is linked to a bank account. Better statistics and visualization help analyze budget and spending and decide to increase or decrease amount for the created budget.

5.2 The Application Demo

The demo feature serves as an essential feature allowing users to access parts of the application without having to sign up. Users will be able to understand the process that the application uses to create a budget scheme, goal scheme and how their budgets are managed on the application demo. Besides that, the user will be allowed to enter their desired values as goals and expenses and view the overall manipulation on the overview section. Since the demo feature will only provide a brief summary of the overall application, features such as linking bank accounts, viewing transactions will only be accessible when the user decides to sign up.

APPENDIX A

THE CONCEPT OF DEMONSTRATION FUNCTIONALITY

This appendix contains information and a book that were used as a part of research to implement the demo function in the WhatachamaBudget application. The current most popular budgeting application on the market is 'Mint.com'. This website was taken as a reference on how the demo feature was implemented and to acknowledge audiences' perspectives on the application. The feature's strong points and weak points were observed and analyzed to note down good ways to tackle the problem.

In terms of book research, "DESIGNING INTERFACES" by TIDWELL, J provided good ideas on how any interfaces could be designed for better user interaction and preference. Besides that, it has also provided insights on how other general features of the application can be enhanced to increase WhatchamaBudget's productivity and audience. The idea of implementing the feature is in more in detail on pages 26-40 in the book.

REFERENCES

- Adams, R. 1994. *Prison riots in Britain and the USA*. 2d ed. London: Macmillan.
- Cooper, A., Reimann, R., Cronin, D., Noessel, C., Csizmadi, J. and LeMoine, D. (2014). *About face*. Indianapolis, Indiana: Wiley.
- “It’s All Coming Together.”Mint, www.mint.com/.
- Polys, N.F., Bowman, D.A. Design and display of enhancing information in desktop information-rich virtual environments: challenges and techniques. *Virtual Reality* 8, 41-54(2004).<https://doi.org/10.1007/s10055-004-0134-0>
- Sauermann, L., Bernardi, A. and Dengal, A. (2020). *Overview and Outlook on the Semantic Desktop*. [ebook] Available at: https://www.researchgate.net/profile/Andreas_Dengel/publication/225070158_Overview_and_Outlook_on_the_Semantic_Desktop/links/Overview-and-Outlook-on-the-Semantic-Desktop.pdf [Accessed 4 Feb. 2020].
- Tidwell, J. (2020). *Designing Interfaces*. [S.l.]: O'Reilly Media, pp.26-40.

BIOGRAPHICAL INFORMATION

Software engineering had been my interest since the beginning of my academic career. I received my Associates in Science from Northlake College in 2017, and then pursued my bachelor's degree in software engineering at The University of Texas at Arlington (Spring 2020). During my academic career, I had the chance to work on various projects including projects that dealt with operating systems, building an android program, and building a budgeting application for Senior Design. Working on projects were a great opportunity to develop my practical knowledge towards what I would be working on in the real life.

I plan to gain practical experience working for a company after I graduate and then down the road get my master's degree. Being part of Honors College was a great experience for me. It provided me out-of-the box experience to work on research papers and increase my connectiveness across the campus.