

SpendWise – An Innovative Expense Tracking Webapp for Students

Manisha More, Rajeev H. Tapadia, Tanmay Tare, Tejas Phalke, Shubham Tayde, Pranav Tayde, Shreya Tarade

Department of Engineering, Sciences and Humanities (DESH) Vishwakarma Institute of Technology, Pune, 411037, Maharashtra, India

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Abstract - The objective of this research paper is to understand requirements that are required in an expense tracking app for students and proposing a prototype of web-based application with required features. The goal of the web app is to assist users, particularly students or individuals responsible for their own finances, in effectively monitoring their expenses, categorizing them, and setting budgets accordingly. The methodology employed involved conducting a literature review to examine existing expense tracking web apps and their functionalities. Surveys and interviews were conducted with potential users to gather insights into their needs, preferences, and pain points. Expert feedback and iterative prototyping were incorporated to refine the requirements. The study provides valuable insights into user expectations, industry standards, and technological feasibility for developing an effective expense tracking web app. The findings offer guidance for the design and implementation of such apps, ultimately contributing to better financial management and decision-making. On the actual implementation side HTML, CSS, JS and Django are used in creating the prototype. Also, the implementation design methodology is briefly discussed in the paper.

Keywords — Budget, Django, Expense, SpendWise, Webapp.

I. INTRODUCTION

In an era characterized by increasing financial complexities and the need for responsible spending, the development of efficient tools for expense tracking and management has become paramount. This research work focuses on the creation and exploration of an expense tracking web app, named SpendWise, designed to empower users, particularly students, in effectively monitoring and controlling their expenses. By providing an intuitive and user-friendly platform, SpendWise aims to facilitate a better understanding of spending habits,

promote financial literacy, and encourage responsible financial decision-making. Through the utilization of cutting-edge technologies, such as Django for backend development, HTML/CSS for frontend design, and Git/GitHub for version control, the research work seeks to address the challenges associated with expense tracking and offer users a comprehensive solution for managing their finances. This paper delves into the features, implementation, future scope, and significance of the SpendWise expense tracking web app, highlighting its potential to transform personal finance management for users and contribute to their financial well-being.

Gomathy says in everyone's life, money plays an important role. A person who cannot manage his expenses cannot successfully lead a household and fulfill his goals. In the current world where mobile phones and laptops have become a part of living, such an app would be handy to deal with all our expenses [1].

Sabab proposed a system where the application extracts the textual information from the receipts using OCR and saves the amount and description for further processing. It also monitors user's income by tracking the received SMSs from the user's saving accounts. By calculating income and expense it produces the user's balance in monthly and yearly basis [2]. But on the contrary side in real world we don't take receipt for each and every expense we make so this system is not feasible.

The novel research conducted in this project addresses the unique challenges faced by students in managing their expenses across various apps and platforms. From a student's perspective, the task of tracking and managing expenses can be overwhelming due to the fragmentation of financial transactions across multiple apps, such as banking apps, payment apps, and budgeting apps. Existing solutions often lack a tailored approach that

caters specifically to the needs of students. In response to these issues, our research presents a web app designed specifically for students, called SpendWise. This app offers a comprehensive and student-centric solution for expense tracking, categorization, and budgeting. By providing a centralized platform and intuitive features, SpendWise aims to simplify the financial management process for students, empowering them to make informed financial decisions and establish responsible spending habits. The research conducted in this project presents a significant contribution to the field by addressing the specific needs and challenges faced by students in managing their expenses effectively.

II. METHODOLOGY/EXPERIMENTAL

Firstly, a literature review was conducted to explore existing expense tracking web apps, their features, and user requirements. This provided a foundation of knowledge and identified any research gaps in the field. Next, surveys or interviews were conducted with potential users, such as students or individuals responsible for managing their expenses, to understand their needs, pain points, and desired functionalities. The collected data was analyzed to identify common patterns and key requirements. Iterative prototyping and user testing were also performed to validate and refine the requirements. The methodology ensured a comprehensive understanding of user expectations, industry standards, and technological feasibility, contributing to the research paper's insights and conclusions.

A. Technologies Used

The initial phase involved a thorough evaluation of popular frameworks such as React.js, with the aim of finding the most suitable solution. However, upon close examination and considering the specific requirements of the project, it became evident that these technologies did not entirely align with our objectives. As a result, a meticulous decision-making process ensued, leading us to adopt a combination of HTML, CSS, and JavaScript for the frontend. This choice ensured the creation of an aesthetically pleasing and highly interactive user interface, tailored to meet the precise needs of our target audience.



Figma was utilized as the design tool for creating the design of front-end interface of the expense tracking web app. Figma is a powerful cloud-based design and prototyping platform that enables collaborative and efficient design workflows. With its intuitive interface and robust set of features, Figma allowed the design team to create visually appealing and user-friendly interfaces for the web app. It facilitated the creation of wireframes, interactive prototypes, and high-fidelity designs, making it easier to communicate design concepts and iterate on the user interface.



To further enhance the frontend development, Bootstrap, a widely recognized CSS framework, was incorporated. By leveraging Bootstrap's responsive design elements, grid system, and pre-built components, we were able to streamline the development process and create a visually appealing and mobile-friendly interface. Additionally, Chart.js, a JavaScript library, was utilized to visualize data in a clear and intuitive manner. This powerful library enabled us to generate interactive charts, graphs, and data visualizations, enriching the user experience and facilitating better understanding and analysis of information.



In parallel, for the backend development, Django, a renowned Python framework, was meticulously chosen for its versatility and scalability. Django provided us with a robust foundation to efficiently handle the server-side operations, ensuring seamless communication between the frontend and backend components of the web application. Leveraging Django's extensive set of

features and libraries, we were able to implement complex functionality, data management, and user authentication mechanisms with relative ease.



Finally, to host the webapp so users can access it on their devices, PythonAnywhere was used. PythonAnywhere provides a convenient and user-friendly environment for running Python web applications. It offers various features such as web server configuration, database integration, and scheduled tasks, making it an ideal choice for hosting Django-based projects.

Git and GitHub were employed for version control during the development of the web app. Git, a distributed version control system, facilitated the tracking of changes, managing different branches, and merging code modifications. GitHub, a widely-used web-based platform for hosting Git repositories, provided a collaborative environment for the development team. It allowed seamless code sharing, review, and management of the project's source code, ensuring a smooth and organized development workflow.



B. Design

The design of the web app is such that there are User, Profile and Expense models created in Django. The expense object derived from the Expense Model has a one-to-many foreign key relation with the User model. Hence a single user can have multiple Expense objects associated with it. The profile has a one-to-one relation with a User model. Hence, each user can only have a single profile. The Profile is used to store current balance related data. The balance is associated to the user through a profile rather than just directly giving the user model balance attribute because in future we can add support for multiple balance accounts hence for the sake of scalability it is done this way. For the user to be able to add the expenses, a Django expense form is created. Using the form expense objects are populated and then stored to the database. A unique ID is generated from each expense so later we can fetch some specific expense from database and edit or delete it as required. For this purpose, edit and delete features were also created. To edit or delete a expense user just has to click on the expense that has to edited from the expense list on the dashboard page. Then user is redirected to a different page with a prefilled form with the existing expense data that is fetched from the database using the ID of the expense that is clicked. With addition, editing or deletion of expenses the balance value stored in profile gets updated. The actual pictures of final UI are given above

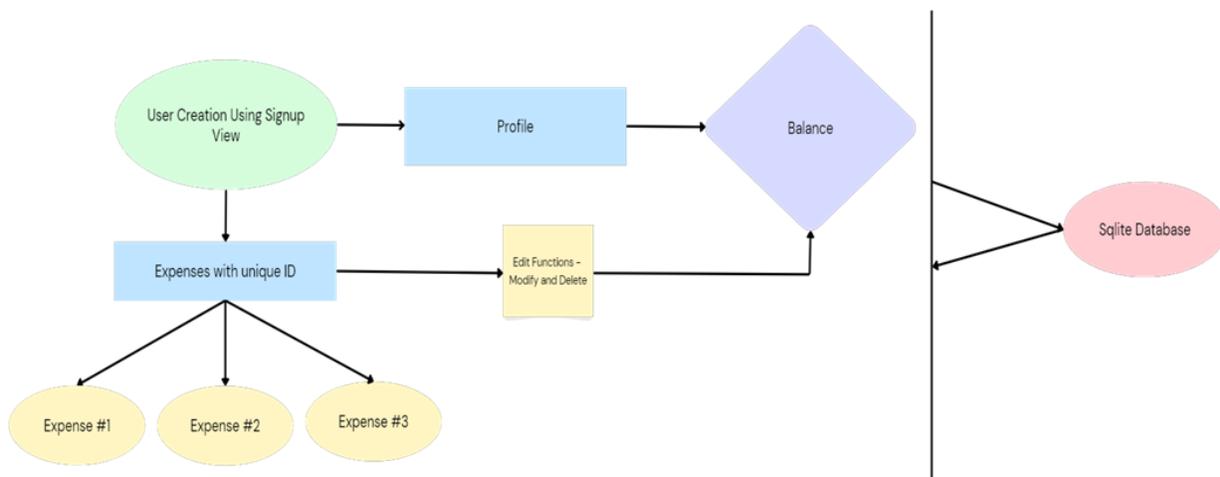


Fig. 1. System Architecture.



Fig. 2. Dashboard.



Fig. 3. Add expense form.

III. RESULTS AND DISCUSSIONS

The key finding from the survey and reviews of existing apps was the exact user requirements. On basic level the user required a short description of the expense, amount, payment method and date of expenditure. Further the user required summation and category wise summation figures. Also, the functionality to edit or delete an expense previously stored in the database and see the already added expenses in a list view. The user required informative graphs to visualize data and get a better understanding of what is the user spending on. The survey also gave the information about various possible categories that were included into the category section of the proposed app. [3] A detailed review of a mobile app named ‘Wallet’ offered on play store by the developer BudgetBakers.com. The important features of this app were various types of graphs that include expense as well as income, category and subcategory wise segregation of the expenses, import from XLX or CSV file, direct synchronization with bank. The cons were that the app required a premium subscription and also it was overcrowded with unnecessary features. It deteriorated the user experience and made it less user friendly. Another app named ‘Andromoney’ was reviewed it had similar categorization features but on the other side it

lacked a user-friendly interface, it was bloated with adware and it didn’t sync user data across devices [4].

IV. FUTURE SCOPE

The SpendWise expense tracking web app has demonstrated its potential as an effective tool for managing and monitoring expenses, enabling users to gain insights into their spending habits and make informed financial decisions. However, the project holds immense potential for future enhancements and advancements, paving the way for further development. The following sections discusses the possibilities for potential features like want, need, must categorization functionality, planned and unplanned expenses segregation, multiple accounts in balance tab, adding more visualization with graphs and charts, generalizing this student centric service for all people.

The advanced categorization functionality to segregate expenses based on wants, needs and musts can be implemented. We can give want/need/must attributes to each expense category for e.g., Food will be tagged with must, shopping with need, entertainment with want. Then we can visualize this data using charts to give further insight to the user. Similar functionality can be implemented for planned and unplanned expense. With this the user will get an understanding of how much money he should keep aside for unplanned and emergency situations.

A feature of associating multiple accounts to the profile of the user can be included. Currently there is only one balance variable but instead a dictionary of key and value pairs i.e., account name and balance can be implemented. The user will be able to name the accounts and set the balance of the individual accounts separately.

The integration of a future scope feature to import expense data from XLS files generated by various banking apps holds tremendous potential for enhancing the functionality of the expense tracking web app. By enabling users to seamlessly upload their banking app-generated XLS files, the web app can automate the process of importing expense data, eliminating the need for manual entry. This future scope functionality would involve developing an intelligent parsing algorithm that can extract and interpret relevant information from the XLS files, such as transaction details, descriptions, and categories. By leveraging this feature, users can effortlessly synchronize their banking app data with the expense tracking web app, gaining a consolidated view

of their financial transactions. This capability not only enhances convenience but also ensures accuracy and saves user's valuable time. Furthermore, it opens doors for potential integrations with multiple banking apps, expanding the reach and versatility of the expense tracking web app.

Finally, the student centric application that we have made can be generalized for working adults and retired people because everyone needs a tool to track and manage their expenses even if their requirement may differ a little bit. Further research will be required to understand which features will be required to be included with this to make it suitable for the different requirements.

V. CONCLUSION

In conclusion, the research paper has highlighted the significant contributions and potential of the SpendWise expense tracking web app in improving financial management. Through the implementation of robust features and functionalities, SpendWise offers users an intuitive platform to track and manage their expenses efficiently. The project has successfully demonstrated the ability to handle user authentication, expense addition, expenditure tracking by category, and budget setting. Furthermore, the seamless integration of PythonAnywhere for hosting and Git/GitHub for version control has significantly streamlined the development process of the SpendWise expense tracking web app.

The research paper has also shed light on the future scope of SpendWise, showcasing exciting possibilities for further enhancement. The proposed functionality of segregating expenses into Wants, Needs, and Musts opens new avenues for users to gain deeper insights into their spending habits and make informed financial decisions. By incorporating different functionalities discussed in the future scope section, SpendWise has the potential to transform into a comprehensive financial management platform.

The work done on SpendWise is of utmost importance in today's fast-paced and complex financial landscape. The web app equips users, particularly students, with the tools and knowledge to navigate their expenses more effectively. By encouraging responsible spending habits and providing insights into spending patterns, SpendWise fosters financial literacy and empowers users to achieve their financial goals. The ease of use, coupled with the application's potential for future enhancements,

renders SpendWise a valuable asset in personal finance management.

In conclusion, the SpendWise expense tracking web app showcases the potential to improve personal finance management. The research paper has laid the groundwork for further exploration, highlighting the future scope of SpendWise. As financial literacy becomes increasingly vital in today's world, the importance of projects like SpendWise cannot be overstated. By empowering users to gain control over their finances, SpendWise serves as a catalyst for achieving financial well-being and fostering responsible financial behavior.

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