CENG318 Human-Computer Interaction
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Project Title: Expense Tracker

Group 7 Final Report

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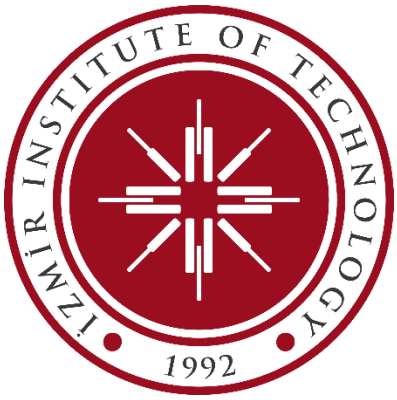

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Abstract

This report presents the development progress of a web-based expense logging and tracking system. The project team, divided into frontend and backend sub-teams, has been diligently working on their respective responsibilities. The backend team has successfully established the structure and implemented authentication, with ongoing work on the core functionality of expense logging and tracking. The frontend team has designed and tested a graphical user interface of the system. The project utilizes various learning resources, including Udemy courses, YouTube playlists, and websites. The user interface prototype was designed using Figma, with frontend development employing HTML, CSS, and JavaScript. The backend uses Spring Boot, and PostgreSQL is employed for the database. The report provides a comprehensive roadmap of responsibilities, from the initial idea generation to the final release. This includes the design and implementation of various pages and functions, UI improvements, debugging, testing, and documentation. The project is a testament to the team's commitment to creating a user-friendly and efficient expense logging and tracking system.

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1 Introduction

In today's fast-paced world, it's not uncommon for us to lose track of our expenditures, often leaving us puzzled about where our money went and how it disappeared so rapidly. We frequently find ourselves contemplating which expenses we could potentially reduce. To address these concerns and aid users in managing their finances, the Expense Tracker app was specifically developed. This app serves as a comprehensive platform that not only monitors individual spending but also allows users to compare their financial habits with friends or nearby individuals.

The Expense Tracker app is a powerful tool that helps users identify potential areas of overspending and guides them in crafting a more accurate and sustainable financial plan tailored to their needs. It empowers users to take control of their financial management and strive towards their monetary goals. By fostering a sense of accountability and providing insightful data about their spending patterns, the app enables users to make more informed decisions about their expenditures.

Whether you're aiming to save for a major purchase or simply striving to be more economical with your spending, the Expense Tracker app provides a comprehensive solution for personal finance management. It's not just an app; it's a financial companion that helps you understand and manage your money better.

2 Literature Review

To create our app, we looked at other ways people have tried to solve the same problem. We studied what works well and what doesn't with these methods. You'll see different methods listed below, which aren't like ours. In the next part, we'll compare them. This helps us understand what's already out there and how we can make our app better.

In the Daniel et al. (2022), the authors have compared their approach with existing methods and applications, highlighting the laborious and time-consuming nature of manual input systems. Their proposed solution aims to automate and streamline the process, making it more efficient and less time-consuming.

The application is developed using Java (Apache Netbeans 11.3) and MySQL Workbench 8.0 CE and is designed to work without internet. It includes various modules such as a welcome module, main window module, add amount module, delete spending module, view spending module, add module, categories module, and search module.

The authors conclude by stating that the application will help users manage their daily expenditures and guide them about their spending habits. It is designed to be useful for people who struggle with daily budget management and wish to manage their money better and keep a record of their daily costs. The authors also mention future enhancements to the application, including the addition of mail and pay mode features and backup details recorded on the database.

Jadhav et al. (2022) present an application called "Expense Tracker" designed to automate and streamline the process of tracking daily expenses. They compare their approach with existing methods and applications, highlighting the laborious and time-consuming nature of manual

input systems. Their proposed solution aims to make the process more efficient and less time-consuming.

The Expense Tracker application is designed to operate without an internet connection, making it a reliable tool for users in various connectivity conditions. The application includes various modules such as a welcome module, main window module, add amount module, delete expense module, view expense module, add module, categories module, and search module. Each module serves a specific purpose, contributing to the overall functionality and user experience of the application.

The authors conclude by stating that the Expense Tracker application will help users manage their daily expen- ditures and guide them about their spending habits. It is designed to be useful for people who struggle with daily budget management and wish to manage their money better and keep a record of their daily costs. The authors also mention future enhancements to the application, including the addition of mail and pay mode features and backup details recorded on the database. These enhancements aim to further improve the functionality and user experience of the application.

KAZI et al. (2021) presents an Android application, ”Expense Tracker,” developed using Angular 8 and SQL lite. This application automates the tracking of daily expenses, aiming to guide users towards financial stability. It records daily income and expenses, issues warnings when daily expenditure exceeds a set limit, and adds unspent money to savings. Monthly expense reports are generated for user review.

The application incorporates several modules, including User Registration and Creation, Adding Income and Expenses, Category Master, Management View (Date and Category Wise), and Remainder. Each module contributes to the application’s functionality and user experience.

The existing system allows users to add salary details and receive notifications about credit and debit details. The proposed system offers three data entry options: Income, Expense, and Wish List. The saved data can be modified as per user requirements. The authors conclude that the Expense Tracker application will aid users in managing their daily expenditures and understanding their spending habits. Future enhancements include various record-keeping options, automatic daily expenditure notifications, and user-defined expense categories. These improvements aim to enhance the application's functionality and user experience.

The scholars previously mentioned have each developed unique methodologies and proposed solutions pertaining to the topic at hand. In the contemporary era, characterized by rapid technological advancements and an increased emphasis on social interaction, numerous applications have begun to incorporate social elements. However, it is noteworthy that existing methodologies have largely overlooked these social aspects. This omission represents a significant gap in the current body of research. In response to this, our research endeavor has chosen to focus on integrating and examining these social features within our approach

3 Methodology

Each member of the team conducts research, gathers information, or considers solutions for every document and product produced throughout the project. The group evaluates the information that is already available and develops/implements plans based on consensus. Agile methodology is used for this project. Each stage begins with an assessment of the current situation, which is followed by the creation of a strategy. In accordance with our plan, we produce our deliverables before moving on to develop the pertinent design. After creating the design, we run tests and evaluate the results. In order to manage our scheduling system, we employ a Gantt chart. Similar to the Kanban method, we track our progress on the Gantt

chart as ongoing, finished, and planned-for-future. The use of a digital tool is the only difference.

Figure 3.1. Agile Method Cycle

Our project was broken up into three distinct phases, as shown by the Gantt chart in the 6th section - Weekly Schedule/Project Plan: pre-project planning, project development, and debugging-testing improvement. Our team concentrated on establishing goals, defining the scope, and creating a clear project roadmap during the pre-project planning stage, which is already complete. By doing this, we made sure that we were ready to take on the development process.

During the project development phase, which has already been completed, our team focused on realizing the targets set in pre-project planning, implementing the defined scopes and implementing the created roadmap to make it concrete.

Debugging-testing improvement is the last stage, which is also done. This step is vital because it involves finding and fixing any problems or bugs in the app to ensure that the software works properly. Additionally, our team carried out comprehensive testing to confirm the app's functionality and usability before making the necessary adjustments to improve the user experience as a whole. We hope to meet the needs of our users by using this organized approach to deliver a high-quality expense tracker app.

In the context of developing an expense tracker app, the process can be divided into the following phases:

Pre-project Planning:

- Each team member proposed various ideas for the project's theme, followed by a collective brainstorming session.
- After narrowing down the options, only two ideas remained.
- The team consulted with their mentor to discuss the feasibility of the remaining ideas, eventually selecting a topic.
- A project proposal document was created for the chosen subject.

Project Phase:

- The team members are divided into two subteams, frontend and backend.
- Various resources, including Udemy courses, YouTube playlists, and websites, were discovered by the team members after it was claimed that the necessary technologies had been researched. A role in the system's development was given to each team member, per those resources.
- Even though the sub teams have responsibility for different sections, they help the other team.
- The ui prototype was designed with a website called Figma.
- The ui discussed with all team members.
- The layout of the homepage and the other pages are discussed and decided.
- Frontend development using Html, Css and Javascript.
- The backend used a technology called Spring Boot.
- For database Postgresql is used.
- A working website is created

Debugging & Testing & Improvement of the System

- After the project development phase ended the debugging-testing improvement phase started. To ensure the project's functionality and efficiency, we run continuous tests on specific parts of the software.
- All of the functions and use cases are tested and validated.

4 Experimental Results

1. Pre-project Planning:

The product for this phase was the project proposal paper. The project timetable was displayed using a Gantt Chart in the article, which used the teamgantt website. We organized our actions in the gantt chart after first examining what needed to be done.

Result: We found the Gantt Chart to be helpful in assessing our progress.

2. Project Phase:

We made an ER diagram on the Lucidchart website so that we could see the requirements of the database. And we developed database structures using the data from the ER diagram.

Result: We have the structure and plan of implementing the database and relationships between entities were made and a database was created.

Designing the UI for the website was the first step in the project process. We used Figma to develop the prototypes.

Result: We are able to move forward with the implementation phase in a proper and organized manner because of prototypes. The main page is currently being implemented, and its components and design are being developed. The Login page is also available in a basic form.

The structure for the backend has been created, and implementation is being done with consideration for the structure.

Result: We have completed the authentication process and are currently developing the expense logging and tracking system.

Our frontend and backend teams likewise made an effort to use the same sources when conducting their own team research. We all conducted our own individual research on various topics.

Result: We combined all the information we gathered and strengthened the structure

In the front-end part, the code has been written so that the user can use the application responsively and fit on every screen.

Result: In all tested dimensions, the app had a positive response and fit on the screen.

The user will be able to use all the functions of the application without any problems.

Result: API has been written for backend and frontend. The user can perform functions.

Necessary port operations and functions have been written so that he can enter from a different environment using a virtual phone and communicate with the back-end.

Result: We got the results we expected from a different system

Recently, everyone worked individually to make improvements to the application and later merged

Result : Merged successfully and corrected faulty parts

3.Debugging & Testing & Improvement of the System:

We test the system functionality and check what is left as a team after each step.

Result: Each bug was discovered by us quickly. We all knew what our system could accomplish and what we could change to make it better.

5 Conclusions and Future Works

Conclusions

This project has successfully developed a web-based expense tracking system that not only monitors individual spending but also allows users to compare their financial habits with friends or nearby individuals. The application is a testament to the team's commitment to creating a user-friendly and efficient expense logging and tracking system. It provides a comprehensive solution for personal finance management, empowering users to take control of their financial management and strive towards their monetary goals.

The application has been designed with a user-friendly interface that includes graphs and a total expenditure table based on categories. It also includes an "expenditure description" section for users to keep more detailed information about their expenditures. The application provides a common platform for different banking accounts and allows users to add friends, creating an expense ecosystem.

Future Works

Moving forward, the team plans to continue improving the application based on user feedback and technological advancements. Future enhancements include various record-keeping options, automatic daily expenditure notifications, and user-defined expense categories. These improvements aim to enhance the application's functionality and user experience.

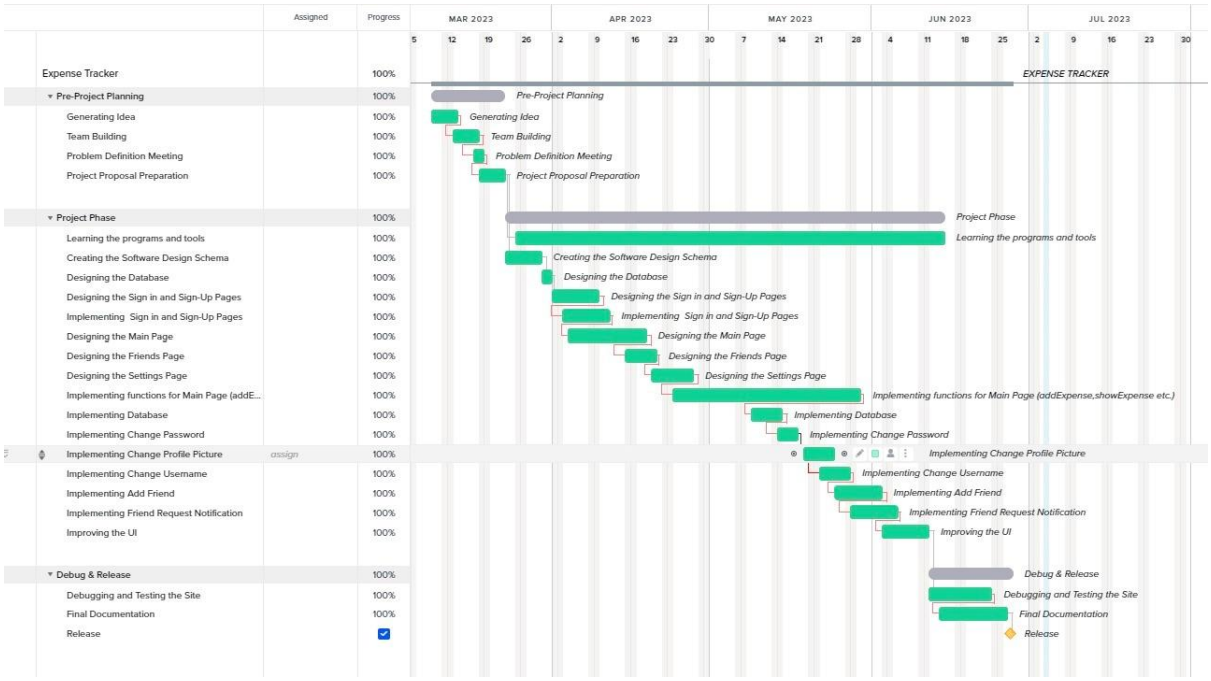
The team also plans to explore the integration of social features within the application, as this is an area that has been largely overlooked in existing methodologies. This could include

features that allow users to share their financial goals and progress with friends, fostering a sense of community and accountability.

In conclusion, the Expense Tracker app is not just an app; it’s a financial companion that helps users understand and manage their money better. The team looks forward to continuing to improve and expand the application to better serve its users and contribute to the field of personal finance management.

6 Weekly Schedule/Project Plan

General Information about Responsibilities:



We divided the team into 2 parts as Frontend and Backend teams and assigned a team leader to both. Erberk is the leader of the Frontend team and Efe is the leader of the Backend team. Selçuk and Harun contributed to Frontend and Harun connected Frontend to Backend.

Specific Information for tasks in Gantt Chart:

Responsibilities Table:

Task	**Efe**	**Erberk**	**Harun**	**Selçuk**
Pre-Project Planning				
Generating Idea			✓	
Team Building		✓	✓	
Problem Definition Meeting	✓	✓	✓	✓
Project Proposal Preparation	✓	✓	✓	✓
Project Phase				
Learning the programs and tools	✓	✓	✓	✓
Creating the Software Design Schema	✓	✓	✓	✓
Designing the Database	✓			
Designing the Sign in and Sign-Up Pages	✓	✓	✓	
Implementing Sign in and Sign-Up Pages	✓	✓	✓	
Designing the Main Page	✓	✓	✓	✓
Implementing functions for Main Page (addExpense, showExpense etc.)	✓	✓	✓	
Implementing Database	✓			

Designing the Settings Page	✓	✓	✓	✓
Implementing Change Password	✓	✓	✓	
Implementing Change Profile Picture	✓	✓	✓	✓
Implementing Change Username	✓	✓	✓	
Designing the Friends Page		✓	✓	
Implementing Add Friend	✓	✓	✓	
Implementing Friend Request Notification	✓	✓	✓	
Improving the UI		✓	✓	✓
Debug & Release				
Debugging and Testing the Site	✓	✓	✓	✓
Final Documentation	✓	✓	✓	✓
Release	✓	✓	✓	✓

Description of Responsibilities:

Generating Idea -> Finding a problem to solve

Team Building -> Communicating with people who needs a team

Problem Definition Meeting -> Deciding how to approach to the problem

Project Proposal Preparation -> Documenting the offered solution

Learning the programs and tools -> Studying the necessary technologies

Creating the Software Design Schema -> Deciding the base logic of the website

Designing the Database -> Creating Er Diagrams and Database Schemas

Designing the Sign in and Sign-Up Pages -> Planning the UI and UX design

Implementing Sign in and Sign-Up Pages -> Implementing Backend and the Frontend

Designing the Main Page -> Planning the UI and UX design

Implementing functions for Main Page (addExpense, showExpense etc.) -> Implementing Backend and the Frontend

Implementing Database -> Create and connect the database to the system

Designing the Settings Page -> Planning the UI and UX design

Implementing Change Password -> Implementing Backend and the Frontend

Implementing Change Profile Picture -> Implementing Backend and the Frontend

Implementing Change Username -> Implementing Backend and the Frontend

Designing the Friends Page -> Planning the UI and UX design

Implementing Add Friend -> Implementing Backend and the Frontend

Implementing Friend Request Notification-> Implementing Backend and the Frontend

Improving the UI -> Making some design improvements if necessary

Debugging and Testing the Site -> Creating Test Cases to be sure that system works perfect

Final Documentation -> Documenting the whole process

Release -> Releasing the website

For our project plan, we have a meeting on wednesday every week except for the first week. Here is the list that in every meeting what we talked, and what we achieved:

18.03.2023: Introduced ourselves, discussed the problem, decided which technologies we will use, and assigned tasks to everyone for project proposal and learning technologies.

22.03.2023: Made the project proposal ready for submitting, discussed the design of the pages, and assigned Frontend and Backend leaders.

29.03.2023: Made a prototype for the main page, and started to implement it while studying the technologies in parallel.

5.04.2023: Implementing and learning phase continued to be progressed. The frontend part of the sign in page and %60 of the main page are done.

12.04.2023: After learning the topics in the lectures we realized that we made some mistakes while designing the pages according to Gestalt Principles. Therefore we decided to change the designs and reimplement the codes.

19.04.2023: We didn’t have any meeting and gave ourselves a rest because of the following holiday.

26.04.2023: Finished the frontend of the Sign in page, had progress on the frontend of the main page, and finished the backend of authentication, but we didn’t connect frontend to backend yet. Discussed and assigned tasks to everyone for the Mid-Phase Progress Report.

01.05.2023: Had a meeting with the teaching assistant Altuğ Yiğit to have a pre-feedback. Arranged a small meeting to update the report according to feedback. Done some reassignment for the updated version.

3.05.2023: Finalized the Mid-Phase Progress Report.

10.05.2023: Off week after Mid-Phase report

17.05.2023: Berkay left the team, so we replanned tasks.

24.05.2023: Connected Frontend and Backend for login and register

31.05.2023: Frontend and Backend of Friends page is done and they connected to each other

7.06.2023: Frontend and Backend of Main page is done and they connected to each other

14.06.2023: Frontend and Backend of Settings page is done and they connected to each other

21.06.2023: Frontend and Backend of friend's main page is done and connected to each other.

28.06.2023: Testing and Debugging are done.

05.06.2023: Created the final report.

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